

ing and afternoon. Then there was an evening discussion of some quantum electrodynamical problems at which Pauli (Zurich) and Born spoke.

The Thursday program consisted of a morning scientific session followed by an arranged bus tour in the afternoon to visit some of the many beauties of Florence, including a drive through the hills on the left bank of the Arno, and a visit to the observatory and physical laboratory of the University. The tour included a visit to Michelangelo's beautiful cave of the Medici, the churches San Croce and the graceful Romanesque San Miniato at Monte on the left bank. At cocktail time the party returned to the Palazzo Vecchio, the fourteenth century city hall of Florence, for a reception to which Medici guards dressed in red and white pantaloons and medieval armor added picturesque color. In the evening the members of the symposium were invited to a performance of "Orfeo," the old opera of Monteverdi, held at the opera house.

Friday's morning scientific session was held again in the Museo Nazionale, as were all the previous ones, but the afternoon session was held in the City Hall of the hill town of Fiesole. After a visit to the town the meeting was concluded by dinner and wine at Fiesole.

The delegates and visitors were all greatly indebted to the hospitality of the Italian Physical Society and particularly to their charming host, Professor Polvani, the president of the Society, whose constant care and kindness contributed enormously to the enjoyment of the meeting.

The scientific meetings were valuable. As usual, probably more benefit was derived from the informal personal discussions and arguments than from the formal talks. These were, however, of considerable interest. The speakers were Born of Edinburgh, Klein of Stockholm, Guggenheim of Reading, Yvon of Strasbourg, De Boer of Amsterdam, Kirkwood of Pasadena, Casimir of Philips Eindhoven, Wataghin of Turin, Gorter of Leiden, Rushbrooke of Oxford, Montroll of Pittsburgh, Onsager of Yale, Prigogine of Brussels, and Mayer of Chicago.

Probably the main themes of the conference could be classified as those following idealizations and those attempting to find exact general relationships.

In general there has been considerable interest in finding idealized models of systems which bear some, although not necessarily too great, resemblance to actual physical systems, but which lend themselves to exact mathematical treatment. The nature of phase transitions and critical phenomena of such idealizations can then be investigated with some certainty, and compared to the experimental findings in physical systems which they are supposed to simulate. This procedure has been stimulated by Onsager's exact solution in the two dimensional case of the so-called Ising model of ferromagnetism.

Montroll spoke of some idealizations similar to that of Ising which lend themselves more readily to exact mathematical solution in the three dimensional case. Rushbrooke pointed out that the Ising model was applicable to a two component liquid solution, and described cer-

tain approximate methods for obtaining the properties of the phase transitions in the three dimensional case.

There was also considerable discussion of the use of distribution functions in the interpretation of statistical mechanical equations. Kirkwood and his co-workers, Born and Green, and Mayer with collaborators have been using this approach.

This general method may be characterized as permitting considerable manipulation and reduction of the equations predicting the properties of real systems without introducing approximations of any kind. Of course the end equations are incapable of any numerical solutions without the introduction of approximation but certain conclusions can be drawn, and relations demonstrated, before such approximations become necessary.

In addition to the discussions following these two general trends there were a number of papers on subjects that could be less easily classified. Klein spoke of the application of statistical methods to the study of nuclear equilibria in stars and showed that the distribution of elements in the cosmos could, at least in some features, be accounted for by the assumption of equilibrium. Onsager spoke about some relations in turbulent flow that could be treated by generalizations of statistical methods.

It is intended that the talks and the main parts of the discussion will be published in a special number of the review of the Italian Physical Society, *Il Nuovo Cimento*.

—Joseph E. Mayer

MISCELLANY

ECLECTIC

Pomona College of California and Wesleyan University in Connecticut have joined the Massachusetts Institute of Technology in a plan for combined liberal arts and technological study which now includes fourteen liberal arts colleges. Under the arrangement, students of high academic standing may pursue a specially planned course for three years in any of the participating liberal arts colleges and then complete the requirements for a science, engineering, or city planning degree in two years at the Institute. Both a B.S. degree from the Institute and a B.A. degree from the liberal arts college are awarded on completion of the program. Other institutions participating in the combined plan include Amherst College of Massachusetts, Bowdoin College of Maine, Miami University of Ohio, Middlebury College of Vermont, Ohio Wesleyan University, Reed College of Oregon, Ripon College of Wisconsin, St. Lawrence University of New York, Washington and Jefferson College of Pennsylvania, College of William and Mary of Virginia, Williams College of Massachusetts, and the College of Wooster, Ohio.

NEW DUTCH JOURNAL

First publication of an international journal which will print reports under the auspices of the Central National Council for Applied Scientific Research in the Nether-

lands (T. N. O.), The Netherlands Physical Society, and the Royal Institute of Engineers of The Netherlands, has been announced by its publisher, Martinus Nijhoff, The Hague. The journal, "Applied Scientific Research," will carry papers in English, French, and German (although preferably the former), and will appear at irregular intervals. It is issued in two sections: Section A containing papers on applied mechanics, hydro- and aeromechanics, heat, and the mechanical and thermal properties of materials; and Section B containing papers on applied electrophysics, acoustics, optics, and the electrical, acoustical, and optical properties of materials. In each section one volume will comprise four hundred and eighty pages and will consist of six issues of eighty pages each. According to the announcement, it is estimated that the publication of one complete volume will require about a year and a half. The subscription price is 20.—guilders (about \$7.60) per volume for each section; American subscribers may order through Tice and Lynch, Inc., Forwarding Agents, 21 Pearl Street, New York City, to whom payments can also be made.

HIGGINS SCIENTIFIC TRUST

The initial distribution of funds for scientific education and research under the thirty-four million dollar Eugene Higgins Scientific Trust will be approximately one hundred and fifty thousand dollars each to Columbia, Harvard, Princeton, and Yale for the academic year 1949-50, Benjamin Strong, chairman of the Board of Control, announced.

The trust was established by the late Eugene Higgins, philanthropist and international sportsman, who died a bachelor at the age of 88 on July 28, 1948.

At Columbia, the largest single allocation of the initial grant will be for nuclear, atomic, and molecular physics in the Pupin Laboratories and at the new cyclotron at Nevis. At Harvard, the funds will be used chiefly in expanding basic research projects in medicine and dental medicine. Princeton will apply its share of the funds to its departments of science and engineering and at Yale the grant will be applied in large part to various fields of medical research.

LOW TEMPERATURE WORK AT OHIO STATE

Temperatures as low as five one-hundredths of a degree above the theoretical absolute zero (minus 273 degrees centigrade or minus 459 degrees Fahrenheit) have been reached by means of the cryomagnetic generator at Ohio State University, according to an announcement by Harald H. Nielsen, head of the department of physics. Earlier reports from the University of California at Berkeley had announced temperature readings there as low as nine one-hundredths of a degree above absolute zero.

AWARD OFFERED

Sigma Delta Epsilon, graduate women's scientific fraternity, has announced that a research award of five hundred dollars will be presented in December to the author or authors of the best paper describing original research which has been published or accepted by a

scientific journal during 1949 or which has been presented at a regular session of a scientific society during 1949. Any woman engaged in research in the mathematical, physical, or biological sciences is eligible provided she has been a member in good standing of Sigma Delta Epsilon for at least six months prior to November 1, 1949. Joint papers will be accepted if the author responsible for the research meets the above requirements. Further details may be obtained by writing to Dr. Lela V. Barton, Boyce Thompson Institute for Plant Research, Inc., 1086 N. Broadway, Yonkers 3, N. Y.

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The Jungfrauoch Scientific Research Station, maintained by an international foundation of five countries (Austria, Belgium, France, Great Britain, and Switzerland) was established in 1931 at an altitude of over 10,000 feet at the upper station of the Jungfrau railway in the Swiss Alps. Primarily active now as a cosmic ray research station, more than fourteen hundred scientists have lived and worked in its laboratories. The Sphinx Observatory, shown above, which was built in 1938, will be equipped with a dome for astronomical observations this year. Both this laboratory and the older one are roofed with concrete and can bear heavy equipment. Research workers from countries not in the foundation have been invited to apply for permission to do research at the Station and may write for information to the President of the Foundation, Professor A. von Muralt, Buhlplatz 5, Bern, Switzerland.