abnormal position of the fluid spaces gives a clue to the presence and location of the tumor.

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FERRITES, IONS, AND APERITIFS

INTERNATIONAL CONFERENCE ON MAGNETISM AT GRENOBLE

The celebration of the fiftieth anniversary of the founding of the Polytechnic Institute of the University of Grenoble provided the locale for the third international conference on magnetism held in Grenoble, July 3–7. The shift of the scene from Strasbourg to Grenoble reflects to some extent the growth in the last decade of a new and important center of magnetic research at the Institute whose birthday was being celebrated. The official title of the conference, "International Colloquium on Ferromagnetism and Antiferromagnetism", is indicative of the expanded interest in such phenomena as low temperature anomalies in the behavior of paramagnetic substances, particularly negative exchange effects, i.e., antiferromagnetism. The latter was the principal subject for the first two days' discussions and accounted for nearly one-half of the total program. Experimental studies on the antiferromagnetic behavior of many substances were discussed. Néel's (Grenoble) theory on the ferromagnetic properties of magnetite was reviewed. In this theory, the anomalously small magnetic moment of magnetite is explained by considering the interactions between iron ions as being antiferromagnetic but with a net unbalance in the dipole density of the interacting planes and in the number of such planes. Experimental evidence in support of the theory was presented by Néel and by others and climaxed by a report of the recent results of Shull (Oak Ridge), whose neutron diffraction studies in magnetite pretty well confirm Néel's picture. It is possible, as shown by Néel, to explain quantitatively the magnitude and temperature dependence of the saturation moment of virtually all of the ferrites in an analogous manner; the interaction is always an unbalanced antiferromagnetic one between the planes of interacting ions and the effect of temperature is manifested through the disordering of the lattice positions of the interacting ions. Snoek (Cleveland) suggests this mechanism for the feebly magnetic Fe_2O_3 as well. Precise experimental data in confirmation of Néel's theory was reported by Pauthenet and Bochirol. This state of unbalanced antiferromagnetism which is responsible for the apparent ferromagnetism of the ferrites has been given the name *ferrimagnetism* by Néel.

Van Vleck discussed quite thoroughly the present status of the theory of antiferromagnetism and described the recent theoretical results of Anderson in which a next nearest neighbor antiferromagnetic interaction can be shown to arise by means of a superexchange when an oxygen or tellurium atom separates the magnetic ions. The experimental confirmation of this by Shull and the results of other neutron diffraction studies in antiferromagnetic materials were also discussed by Van Vleck. Trombe (Paris) discussed the antiferromagnetism of the protoxydes of cobalt and of nickel and also presented conclusive evidence for the existence of ferromagnetism in metallic dysprosium at low temperatures with a ferromagnetic Curie point at approximately 175° K. Dysprosium thus takes its place as the fifth indisputable ferromagnetic element.

Some experimental work on the magnetic behavior of various alums at low temperatures by Kurti (Oxford) and Garrett (Cambridge) reflected the recently kindled British interest in antiferromagnetic phenomena. Both these investigators consider the anomalous magnetic behavior of these materials at very low temperatures to be due to an antiferromagnetic exchange interaction which in all cases sets in at temperatures well below 0.1° K.

Kittel's paper on ferromagnetic resonance (presented by Bozorth) was the first of several American papers on selected topics in ferromagnetism. The paper and discussion revolved principally about the distinction between the spectroscopic splitting factor, g, and the magnetomechanical ratio g' which had formed the basis of an earlier paper in *The Physical Review* by the same author. The former is measurable by means of a ferromagnetic resonance experiment with appropriate corrections for the demagnetizing fields of the static and RF magnetization components in accordance with Kittel's theory and is usually greater than 2.0; the latter is the result obtained in classical gyromagnetic experiments of the Einstein-De Haas or the Barnett type and is less than 2.0. Both Kittel and Van Vleck have treated this problem theoretically and their views formed the basis of Kittel's paper and the ensuing discussion. Gorter made the suggestion that the g, g' notation employed by Kittel be generally adopted in the literature and adhered to strictly in order to avoid misunderstanding. Other papers by Americans at this and the following sessions included: Bozorth on the Bell Laboratory's powder pattern experiments which included the showing of the by now well known motion picture of domain boundary movements which excited the Europeans in this audience just as it did Americans at its premiere; Shockley on dynamic experiments with a simple domain boundary in a single crystal and their theoretical interpretation; Smoluchowski on the theory of the influence of order on magnetic properties with particular emphasis on the saturation moment (presented by Goldman); and Goldman on new techniques and results in the measurement of magnetostriction including discussion of a new theory of the Alnico V effect based on some recent magnetostriction data measured on very small single crystals. Following a paper by Stoner reviewing the collective electron theory of ferromagnetism, Van Vleck presented a discussion on the calculation of the temperature dependence of the susceptibility in a ferromagnet in the interval between the range of applicability of the Bloch theory and the Heisenberg theory. Opechowski's work is somewhat unsatisfactory because of the nonconvergence of the series when χ is expressed as a function of T. Recently Zailer has recalculated the coefficients of the series and obtains convergence and a calculated Curie temperature that is quite reasonable.

The latter part of the conference dealt primarily with the properties of ferromagnetic materials. Becker (Göttingen) discussed the dynamics of the motion of the Bloch boundary and the consequent behavior of the permeability at very high frequencies. Sucksmith (Sheffield) described new measurements of the saturation moment and Curie point of some ferromagnetic metals and alloys. His extremely rigorous technique for carefully establishing the Curie point has enabled him to obtain good data on both hexagonal and face-centered cobalt. Employing his now well known technique of magnetic phase analysis to the case of order-disorder transformations, Sucksmith demonstrated that the ordered and disordered states probably coexist in Fe_3Al as in Co-Pt as demonstrated by Smoluchowski and Newkirk. Hozelitz's (Sheffield) paper on recent progress in permanent magnets provided the opportunity for one of the liveliest discussion sessions of the conference centering particularly about the structure and source of the anisotropic properties of Alnico V.

A résumé of the conference would not be complete without at least mention of the hospitality of the French Government through the Centre Nationale de Recherche Scientifique in the form of aperitifs for the discussion laden recesses, the organized afternoon trip to the Grand Vecors Range of the French Alps and a banquet for the invited guests catered as only the French can do and providing an appropriate setting for the inimitable Van Vleckian toasts in an inimitable French. Professor Van Vleck was, incidentally, one of three Americans (the other two were Watson of IBM and Sporn of American Gas and Electric) to be presented with an honorary degree by the University of Grenoble at a convocation to celebrate the occasion.

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MEETINGS TO BE HELD

AAAS MEETING IN CLEVELAND

The 1950 annual meeting of the American Association for the Advancement of Science is to be held December 26–30 in Cleveland and preliminary announcements of the program indicate that the meeting will at the very least be well attended. All seventeen of the Association's sections and subsections and more than forty participating organizations are completing plans for a total of over two hundred sessions to be held during the five-day period. The Annual Science Exposition, to be held in the Arena of Cleveland's Public Auditorium, is to be almost twice as large as last year's show in New York. Some one hundred and fifty booths will be used by publishers, supply houses, and industrial firms to display their wares and the Atomic Energy Commission's American Museum of Atomic Energy is planning an extensive exhibit, including a model of an atomic pile. Also scheduled is a series of tours to nearby museums, laboratories, and industrial plants.

In physics, a session is planned on "Fifty Years of the Quantum Theory" and three other sessions will be concerned with the implications of nuclear phenomena in the fields of astrophysics, geophysics, and biophysics. Also of interest are a four-part symposium on the biological effects of radiation and a symposium in three parts which will deal with the partnership of industry and science in research.

APPLIED MECHANICS CONFERENCE IN 1951

The first National Congress of Applied Mechanics is to be held in Chicago from June 11 to 16, according to an announcement from the Illinois Institute of Technology, which will play host for the event. According to Lloyd H. Donnell, research professor of mechanics at Illinois Tech who is general chairman of the Congress, plans have been completed to hold the national meetings every four years, between the International Congresses of Applied Mechanics which are also held at four-year intervals. The national meetings are planned to supplement the international meetings.

Papers for presentation at the Congress must be submitted before April 14, 1951, and should constitute original research in applied mechanics, which includes kinematics, dynamics, vibrations, waves, mechanical properties of materials and failure, stress analysis, elasticity, plasticity, fluid mechanics, and thermodynamics. Papers will be limited to no more than five thousand words or the equivalent in equations, tables, and diagrams; one half-hour will be allotted for presentation and discussion of each paper. It is intended that the papers accepted will be published in full in the *Proceedings* of the Congress, to appear within the year following the Congress.

The Congress is under the sponsorship of the following professional societies and universities: the American Physical Society, the American Mathematical Society, the American Institute of Chemical Engineers, the American Society of Civil Engineers, the American Society of Mechanical Engineers, the Institute of Aeronautical Sciences, the Society for Experimental Stress Analysis, the U. S. National Committee on Theoretical and Applied Mechanics, Illinois Tech, Purdue University, Northwestern University, and the University of Illinois.

400 RESEARCH PROJECTS SUPPORTED

RESEARCH CORPORATION GRANTS

Research grants totaling more than one million dollars were awarded during the past fiscal year by Research Corporation, a nonprofit educational and scientific foundation with offices in New York City, according to the organization's annual report. Research Corporation is now supporting more than four hundred active projects in American colleges, universities, and scientific institutions under the postwar program of Frederick Gardner Cottrell grants, initiated in 1945 to help rebuild the war-depleted supply of research scientists. The grants in aid program, devoted mainly to the physical sciences, is supported by the net earnings from the design and installation of Cottrell electrical precipitation equipment for cleaning industrial gases, and from management of patents for institutions and individual inventors.