News and Notes

ONR Conference on Physics and Chemistry at High Temperatures

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A conference on physics and chemistry at high temperatures was held at the Research Institute of Temple University in Philadelphia on April 25. Sponsored by the Office of Naval Research, Department of the Navy, the conference was arranged to bring together those engaged in high temperature research under ONR and related contracts. It was attended by 80 invited guests and participants representing government agencies, universities, and industrial concerns interested in high temperature research. The technical program included papers on the production and measurement of high temperatures and the reactions of gases, metals, and ceramics under these extreme conditions.

The operation of a solar furnace was described by William M. Conn of Rockhurst College, Kansas City, Missouri. Radiant energy from the sun is concentrated in this furnace by a parabolic mirror in a sample placed near the focal area of the mirror. This method is limited to a small heating area but it produces rapid, controlled heating without electrical interference. When the sample is enclosed in a suitable quartz container experiments may be carried out in various types of atmosphere and under pressure limited only by the breaking point of the quartz. Dr. Conn has reached temperatures of 3000° C in this type of furnace equipped with an aluminum mirror 120 in. in diam and 34 in. in focal length.

The production of high temperatures by the combustion of metals was reported by Aristid V. Grosse, of the Research Institute of Temple University. The temperature is obtained by burning metals with oxygen under either atmospheric conditions or pressures up to 300 psi. When metals that have a high exothermic heat of reaction and simultaneously form highly refractory oxides are used, the heat liberated is concentrated close to the reaction zone to produce the high temperature. Aluminum, calcium, magnesium, titanium, and zirconium have been burned successfully under atmospheric conditions. The aluminum reaction produces the highest temperature, which has been observed to be in the neighborhood of 2800° C. Theoretically, it should be possible to obtain a temperature of 6500° C by burning zirconium in oxygen at 100 atmospheres.

The first public demonstration of the method was made following presentation of this paper, when aluminum was burned with oxygen under atmospheric conditions. A special alumina furnace was charged with aluminum dust and shavings, which were easily ignited with a lighted cigarette. Aluminum rods were fed into the furnace to maintain the temperature. The interesting phenomenon of the "skating sun" was observed in the furnace. The skating sun is a brilliant body of boiling aluminum, of a flat and round shape, burning in oxygen and skating on the surface of molten alumina.

Oxidation studies on "cermets" at high temperatures were reported by W. B. Crandall, of Alfred University. Cermets are mixtures of refractory oxides and metals in which the metal component is added for strength and the ceramic component is used for its refractory properties. The systems studied included binary mixtures of CO, Ni, Fe, Al, and Be with Al_2O_3BeO, MgO, ZnO_2. Dr. Crandall suggested that the oxidation behavior may be explained by considering the rate at which oxygen diffuses into the physical system and by the rate at which oxygen is removed from the pores by oxidation of the metal. It was indicated that there may be applications for these materials in high temperature-high stress work if the oxidation rates of the metal components can be controlled.

Tantalum silicides were offered as promising new ceramic materials by Leo Brewer, of the Radiation Laboratory of the University of California, who reported the investigation of a number of borides, carbides, silicides, and sulfides. Cesium and thorium sulfides, tantalum, titanium, and zirconium carbides, and cesium and tantalum borides were reported as being resistant to electropositive metals at temperatures above 2000° C.

Dr. Brewer also reported on the constitution of the saturated vapor over a number of oxides at high temperatures. He has found that many refractory oxides vaporize by decomposition to the elements. Thus in the case of MgO, CaO, ZnO, CdO, HiO, FeO, MnO, and probably most of the alkali oxides except Li_2O, the agreement between observed and calculated volatilities indicated that the undecomposed diatomic molecules are not important in the vapor.

Three papers were presented covering work being done at the Cryogenic Laboratory, Ohio State University. Herrick L. Johnston discussed the high temperature properties of tantalum and described a drop calorimeter, a high temperature x-ray camera, and vapor pressure cells that employ either the Zangmuir or the Knudsen method. Using this equipment, data have been obtained up to about 2200° C. In a second paper, Dr. Johnston described an apparatus similar in design to a precision vacuum calorimeter, which was developed to measure gaseous pressure-volume-temperature data at low temperatures. Using this apparatus, gaseous data of state for hydrogen have been obtained. Approximately 30 PV isotherms have

been determined for hydrogen at temperatures between 20° and 350° K for pressures up to 200 atmospheres and the results have been used to calculate the second and third virial coefficients.

In the third paper, Rudolph Speiser discussed the role of surface adsorption in physical metallurgy at high temperatures. Dr. Speiser reported that by the application of surface thermodynamics it is possible to predict the circumstances under which the solute in a binary alloy is concentrated or deflected in the grain boundary.

The existing experimental and theoretical data on the specific heats of gases at temperatures above 1000° C were reviewed by W. S. Benedict, of the National Bureau of Standards. He discussed the precision of experimental results and the limitations of theoretical specific heats connected with dissociation and relaxation phenomena.

A review of the measurements of flame temperatures was presented by H. P. Broida, of the National Bureau of Standards. It included the problems which have been and will be encountered in these measurements and conjecture on the direction of future research in this field.

The measurement of temperatures up to 2000° C by a method termed noise thermometry was described by A. W. Lawson, of the University of Chicago. Employing the principle that the root mean square of the radiofrequency generated by thermal agitation in resistors varies with the temperature, the method compares noise from a known cold source with that from the unknown hot source through a null circuit with an accuracy of 0.1 percent. Experiments indicate that noise thermometry should be capable of competing with other laboratory absolute temperature scales at high temperatures and pressures.

The conference was opened by an address of welcome by Robert L. Johnson, president of Temple University, and an introduction by Alan T. Waterman, chief scientist of the Office of Naval Research. Aristid V. Grosse, president of the Research Institute, presided at the morning session and A. Michels, of Van der Waals Laboratory, presided at the afternoon session. The leadership of Dr. Michels produced many interesting discussions which lasted into the early evening.

Conference on Interaction of Steroids and Enzymes

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A conference on interaction of steroids and enzymes was held March 8–10 under the sponsorship of the recently organized Ciba Foundation at its center in London, England. This conference is one of a series to be sponsored by the foundation in carrying out one phase of its program for "The Promotion of International Cooperation in Medical and Chemical Research."

In accordance with the informal purpose of these conferences, the attendance was limited to about 15 guests, of whom there were from the U. S., three from Scotland, and the remainder from England. Several guests from other countries were unable to attend. S. J. Folley, of the Institute of Dairy Research, University of Reading, England, served as chairman.

The first day of the conference was devoted to enzyme studies with respect to the reproductive functions. W. H. Fishman and G. T. Mills discussed the measurements, nature, and properties of glucuronidase. I. D. E. Storey reported that mouse tissues apparently have a different mechanism from those of the guinea pig for the synthesis of glucuronides and indicate a possible participation of carbon dioxide. Curnow and Dodds reported that only small amounts of injected synthetic estrogens or their glucuronide appear in the urine as glucoronide. Furthermore, differences among species were noted. W. H. Fishman reported some correlations of degree of glucuronidase activity with the amount of estrogen present in the organism.

R. K. Meyer correlated changes in *corpora lutea* activity under various normal and induced endocrine states with changes in alkaline and acid phosphatases, succinoxidase and malic dehydrogenase.

The second day of the conference was devoted to the relationship of enzymes to metabolic processes induced by hormones. C. D. Kochakian discussed the influence of androgens, estrogens, corticoids, growth hormone, alloxan and phlorizin diabetes, and diet on the arginase and alkaline and acid phosphatases of the liver, kidney, and intestine of various laboratory animals in relation to their effects on protein metabolism. A. L. Greenbaum described changes in arginase and alkaline phosphatase activity in the liver and mammary gland during various phases of lactation in normal and adrenalectomized rats.

W. H. Fishman, as a result of his studies and others', concluded that ß-glucuronidase is concerned with some specific process in growth which is often related to estrogen action. R. K. Meyer pointed out that the growth induced in the rodent uterus is accompanied by an increase in glucuronidase.

Elson was unable to relate the growth-inhibiting action of cancer-producing substances to hormonal regulation of protein and carbohydrate metabolism.

Raymond L. Zwemer, executive secretary of the National Academy of Sciences and of the National Research Council, has been appointed chief of the Science Division and consultant in biology of the Library of Congress. Dr. Zwemer will take over his duties as division chief July 1, and will serve as biology consultant beginning June 1.

Howard J. Shaughnessy, chief of the Division of Laboratories, Illinois Department of Public Health, has been appointed professor and head of the newly created Department of Public Health at the University of Illinois College of Medicine. Dr. Shaughnessy will divide his time between the university and the Department of Public Health, where he will continue to serve as director of laboratories.

Eugene B. Ferris, Jr., associate professor of medicine at the University of Cincinnati College of Medicine, has been elected president of the American Society for Clinical Investigation. Dr. Ferris is also editor of the society's *Journal of Clinical Investigation.*

William A. Mussen, of the U. S. Naval Ordnance Laboratory, has been appointed supervisor of the Electronics Laboratory at Southwest Research Institute, San Antonio, Texas.

William F. Harrigan succeeds the late **Leo Winter** as chairman of the Department of Oral Surgery at New York University's College of Dentistry. Dr. Harrigan is associate oral surgeon at Bellevue Hospital.

Visitors to U. S.

Gunnar Nilsson-Leissner, of Stockholm, newly appointed seed consultant of United Nations Food and Agriculture Organization, will arrive in Washington, D. C. this fall to coordinate seed supplies for all countries.

Thirteen physicists from abroad will participate in the Conference on Ionospheric Physics, to be held at Pennsylvania State College July 24–27 (see *Science,* March 17, p. 293). They are: **S. K. Mitra,** University College of Science and Technology, Calcutta, India; **L. Harang,** Norwegian Defense Research Establishment, Kjeller, Norway; **S. Chapman,** Oxford University, Oxford, England; **L. G. H. Huxley,** Adelaide University, Adelaide, South Australia; **J. Sayers,** The University, Birmingham, England; **W. Dieminger,** Institüt fur Ionospharenforschung, Lindau, Germany; **D. F. Martyn,** Australian Council for Scientific and Industrial Research, Canberra, Australia; **K. Weekes,** Cambridge University, Cambridge; **Peter M. Millman,** Dominion Observatory, Ottawa, Canada; **D. R. Bates,** University College, London; **M. Nicolet,** Department of Radiation, Royal Meteorological Institute of Belgium, Uccle; **R. v. d. R. Woolley,** Commonwealth Observatory, Canberra, Australia; and **W. R. Piggott,** directorate of radio research, Department of Scientific and Industrial Research, Slough, England.

F. A. S. Gwatkin, chairman of the Proprietary Association of Great Britain, is one of the speakers at the annual meeting of the Proprietary Association of America, being held this week at White Sulphur Springs, West Virginia.

Suzanne Leclercq, director of paleobotany at the University of Liège, arrived in New York City April 11 for a ten-week study of Devonian and Carboniferous fossil collections at U. S. universities, including Harvard, Cornell, Michigan, Chicago, Illinois, and Washington University at St. Louis.

Visiting lecturers at the Massachusetts Institute of Technology during the summer will include **P. Scherrer,** of the Eidgenoissische Technische Hochschule, Zurich, who will lecture on "Experimental Atomic Physics," and **E. Amaldi,** of the University of Rome, whose subject will be "Nuclear Physics."

Grants and Awards

The Daniel and Florence Guggenheim Jet Propulsion Center at the California Institute of Technology has granted six fellowships for 1950–51—twice the number granted last year. Recipients were Thomas C. Adamson, Jr., LeGrange, Illinois; Eldon L. Knuth, Luana, Iowa; Robert V. Meghreblian, Los Angeles; Joseph E. Padgett, Jr., Baltimore, Maryland; David E. Shonerd, Pasadena, California; and Edward E. Zukoski, Birmingham, Alabama. Mr. Meghreblian, a native of Cairo, Egypt, received the grant for the second time.

The Life Insurance Medical Research Fund has approved awards totaling $670,000 to medical schools and other research centers during 1950 for the study of heart disease and the training of research scientists. Recipients of the Lasker Award from the American Public Health Association last year for its contributions to the advancement of medical science and public health, the Life Insurance Medical Research Fund is now being supported by 147 life insurance companies of the U. S. and Canada. Fifty-one research programs will be supported by grants of $548,000 to 36 institutions. An additional $122,000 will go to 34 research fellows to help fill the deficiency in trained research workers. The largest grant, $21,000, went to Johns Hopkins University School of Medicine for research by E. K. Marshall, Jr., on the pharmacology of cinchoninic acid derivatives.

The Theodore William Richards Medal was presented on May 11 to John Gamble Kirkwood, of the California Institute of Technology, at a meeting of the Northeastern Section of the American Chemical Society. Professor Kirkwood was cited for his contributions to the development of statistical mechanics.

The Elisha Mitchell Scientific Society has awarded the **William Chambers Coker** prize for 1950 to Shantilal A. Vora for his thesis, "Bounds for the Distribution of Chi-Square" in the Department of Mathematical Statistics, University of North Carolina. The $50 prize, established two years ago, is awarded annually for a doctoral thesis in science.

Frederick D. Rossini, chief of the Thermochemistry and Hydrocarbons Section of the National Bureau of Standards, has been named to receive the **Department of Com-**

merce Exceptional Service Award for his contribution to the field of hydrocarbon research.

Henry C. Harris, agronomist, Florida Agricultural Experiment Station, Gainesville, Florida, has been awarded the first **Oak Ridge Research Fellowship**, and will do a year's research at the Oak Ridge Laboratory using radioactive isotopes.

The Psychophysiology Branch, Human Resources Division, Office of Naval Research announces that the following contracts have recently been made: L. L. Sloan at the Wilmer Ophthalmological Institute, Johns Hopkins University, will investigate visual depth perception; and at Brown University Carl Pfaffmann will do research in the psychophysiological factors in taste sensitivity, and Lorrin A. Riggs will carry on the study of corneal-retinal potentials.

Fellowships and Prizes

The Social Science Research Council has received a grant of $465,000 from the Carnegie Corporation to finance faculty research fellowships over a five-year period. Seven fellowships will be awarded annually. Each candidate must be under the age of 35 years, have a doctoral degree or its equivalent in one of the social sciences, be a regular faculty member in a U. S. college or university, and be nominated or endorsed by the head of his or her department. Further information may be obtained from Elbridge Sibley, Executive Associate, Social Science Research Council, 726 Jackson Place, Northwest, Washington, D. C.

Sigma Delta Epsilon announces that a second research award of $500 will be presented during the AAAS meeting in Cleveland, Ohio, in December. Members of Sigma Delta Epsilon, in good standing as of April 1, 1950, and engaged in research in the mathematical, physical, or biological sciences, are eligible. Joint papers will be accepted. The award will be given to the author or authors of the best paper describing original research, published or accepted for publication in a scientific journal during 1950, or presented at a regular session of any scientific society meeting during the year. Papers must be submitted in triplicate to the Research Awards Committee not later than *October 1.*

Another award of $200 is available for 1950 for the best paper describing original research carried out in the home. Conditions of the award will be similar to those just mentioned. For further information write Lela V. Barton, Chairman, Research Awards Committee, Boyce Thompson Institute for Plant Research, 1086 N. Broadway, Yonkers 3, New York.

The School of Medicine, Western Reserve University, has established an **Eddie Painton Fellowship in Rheumatic Fever** in the Department of Preventive Medicine and the university hospitals. One year of clinical work and one year of laboratory work, or two years of clinical training are prerequisites for the fellowship and it carries a stipend of $3,600 per year. Appointments will be made annually, but are subject to renewal. Applicants should write to Dr. John H. Dingle, Department of Preventive Medicine, School of Medicine, Western Reserve University, Cleveland 6, Ohio.

Summer Programs

Two summer courses will be offered by the University of Virginia at its **Mountain Lake Biological Station.** The first term (June 15–July 19) will include studies in morphology of seed plants, plant taxonomy, experimental morphogenesis, and acoelomate invertebrates. The second term (July 20–August 23) will include general physiology, aquatic biology, plant ecology, and morphology of the animal cell. Further information may be obtained by writing to the Registrar, Summer Session, University Station, Charlottesville, Virginia.

The third annual industrial microbiology short course will be held at Purdue University June 19–July 1, under the direction of C. L. Porter, professor of botany. The course includes a two-week program for research and production directors and technicians, and a refresher course for college teachers and research workers. Additional information may be obtained from Dr. C. L. Porter, School of Science, Purdue University, Lafayette, Indiana.

Meetings and Elections

First Symposium of the Chemical-Biological Coordination Center

More than 250 chemists and biologists are expected to meet in Washington this week for a symposium that includes a discussion of the program of the National Research Council's four-year-old Chemical-Biological Coordination Center (*Science*, March 3, p. 244).

Biological properties of chemicals are often discovered accidentally and many times have to be rediscovered when needed for a specific purpose because the original findings have received little notice. The aim of the CBCC is to make such information readily available. The need for such work—the assembling and organizing of data relating the effect of structure of chemicals upon their biological activity—was demonstrated during the war by the Insect Control Committee of the Office of Scientific Research and Development. The CBCC is carrying on that committee's work, but in a program of vastly broader objectives. Thus far the project has developed in three fields of activity: correlating material already published, sponsoring biological tests of chemical compounds, and preparing review articles on the effect of chemical structure upon various biological actions.

The center, directed by W. R. Kirner, has an executive committee and an advisory committee, both under the chairmanship of M. C. Winternitz, and subcommittees on biochemistry, chemotherapy, entomology, mammalogy, medicine, microbiology, physical chemistry, plant sciences, sanitary engineering, veterinary medicine, malignancy, organic chemistry, and physiology-pharmacology. Its scientifically trained staff of 16 persons has worked out elaborate chemical and biological codes, with the assistance of codification panels headed by C. Chester Stock, J. C. Bailar, and McKeen Cattell. By means of these

codes, data on the biological, chemical, and physical properties of compounds are recorded on punch cards and sorted by IBM machines for correlation studies.

Because many compounds have been tested for only a single purpose and many others have never been examined at all for biological activity, the CBCC solicits compounds synthesized by private investigators, institutions, and commercial laboratories. It has a roster of approved nonprofit laboratories that conduct screening experiments to determine the biological usefulness of the compounds. Data resulting from the tests are promptly reported to the person who submitted the compounds and are also critically reviewed by the center and its appropriate subcommittees and organized for further use. The center takes no responsibility, however, for publication of data on the synthesis of compounds or their biological action, or for patent applications on useful chemicals.

The proceedings of this week's symposium will be published in full. The Chemical-Biological Coordination Center is still in the experimental stage and it invites the suggestions and cooperation of chemists and biologists who cannot attend the meeting.

The 13th meeting of the Meteoritical Society will be held September 5–7, at the Museum of Northern Arizona, Flagstaff, Arizona, and at the Canyon Diablo Meteorite Crater. The scientific sessions, which will be open to the public, will begin at 9 a.m. and 2 p.m. on Tuesday and Wednesday at the Museum of Northern Arizona. The excursion to nearby Canyon Diablo Meteorite Crater is scheduled for Thursday.

The National Academy of Sciences, at its annual meeting in Washington, D. C., April 24–26, elected a new president, a foreign secretary, two additional council members, 30 academy members, and two foreign associates.

The new president is Detlev W. Bronk, president of Johns Hopkins University and chairman of the National Research Council. Dr. Bronk, who succeeds Alfred N. Richards, will serve a four-year term beginning July 1. Roger Adams, head of the Department of Chemistry, University of Illinois, and president of the AAAS, was elected foreign secretary, succeeding Dr. Bronk for a four-year term ending June 30, 1954. Oliver E. Buckley, president of Bell Telephone Laboratories, and Walter S. Hunter, chairman of the Department of Psychology at Brown University, were elected to membership on the Council of the Academy to serve until June 30, 1953.

Newly elected members are: Francis Birch, professor of geophysics, Harvard University; S. Bochner, professor of mathematics, Princeton University; James Bonner, professor of biology, California Institute of Technology; Ernst Cloos, professor of structural geology, Johns Hopkins University; Lyman C. Craig, member of Rockefeller Institute for Medical Research, New York City; Lester R. Dragstedt, chairman, Department of Surgery, University of Chicago; David R. Goddard, chairman, Department of Botany, University of Pennsylvania; Herbert S. Harned, professor of chemistry, Yale University; G. Evelyn Hutchinson, director of graduate studies in zoology, Yale University; M. R. Irwin, professor of genetics, University of Wisconsin; Edward Calvin Kendall, head of Section on Biochemistry, Mayo Clinic; Gerard P. Kuiper, professor of astronomy, Yerkes Observatory, University of Chicago; W. F. Libby, professor, Institute for Nuclear Research, University of Chicago; Fritz A. Lipmann, head of Biochemical Research Laboratory, Massachusetts General Hospital, Boston; R. Lorente de No, member of Rockefeller Institute for Medical Research, New York City; Frank C. Mann, professor of experimental medicine, Mayo Foundation, University of Minnesota; Kenneth F. Maxcy, professor of epidemiology, School of Hygiene and Public Health, Johns Hopkins University; C. E. Kenneth Mees, director and vice president in charge of research, Eastman Kodak Company; Eger Vaughan Murphree, president and director, Standard Oil Development Company, New York City; Alfred O. Nier, professor of physics, University of Minnesota; Arthur E. Raymond, vice president and director, Douglas Aircraft Company, Inc., Santa Monica, California; Bruno B. Rossi, professor of physics, Massachusetts Institute of Technology; B. F. Skinner, professor of psychology, Harvard University; J. A. Stratton, provost of Massachusetts Institute of Technology; Victor C. Twitty, chairman of Department of Zoology, Stanford University; George Wald, professor of biology, Harvard University; Howel Williams, chairman of Department of Geological Sciences, University of California, Berkeley; Ralph E. Wilson, astronomer, Mount Wilson Observatory; Oskar Wintersteiner, head of Division of Organic Chemistry, Squibb Institute for Medical Research, New Brunswick, New Jersey; M. L. Wolfrom, head of Division of Organic Chemistry, Ohio State University.

Foreign associates are: Charles Herbert Best, director of Banting and Best Department of Medical Research, University of Toronto; and Albert Jan Kluyver, professor of microbiology, Technical University of Delft, Netherlands.

Recently Received—

Handling Radioactive Wastes in the Atomic Energy Program. U. S. Atomic Energy Commission. U. S. GPO, Washington 25, D. C. 15 cents.

Possibilities for Oyster Culture in Puerto Rico and the Virgin Islands. Special Scientific Report: Fisheries No. 9. Fish and Wildlife Service, U. S. Department of Interior, Washington 25, D. C.

Methods for Microbiological and Chemical Determinations of Essential Amino Acids in Proteins and Foods. U. S. Department of Agriculture Misc. Publ. 696. U. S. GPO, Washington 25, D. C. 10 cents.

Microphthalmos and Anophthalmos With or Without Coincident Oligophrenia. Torsten Sjögren and Tage Larsson. Ejnar Munksgaard, Norregade 6, Copenhagen, Denmark.

Canadian National Research Council Review, 1949. Council on Scientific and Industrial Research, Ottawa, Canada.