SCIENCE

VOL. 90 FRIDAY, NOVEMBER 17, 1939 No. 2342

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal

Lancaster, Pa. Garrison, N. Y.

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE SIXTH PACIFIC SCIENCE CONGRESS

By Professor ROY ELWOOD CLAUSEN

UNIVERSITY OF CALIFORNIA; SECRETARY-GENERAL OF THE SIXTH PACIFIC SCIENCE CONGRESS

THE sessions of the sixth Pacific Science Congress were held in the San Francisco Bay region from July 24 to August 12, 1939. The University of California, Stanford University and the Golden Gate International Exposition acted jointly as hosts to the congress. Most of the technical sessions were held either at the Universersity of California or at Stanford University, but many of the social functions and public lectures were held at the Golden Gate International Exposition on Treasure Island.

The sixth Pacific Science Congress was organized under the auspices of the National Research Council, specifically under the general supervision of its Committee on Pacific Investigations, of which Dr. Herbert E. Gregory is chairman. The details of organization of the congress, however, were delegated to a local committee, the Committee on the Sixth Pacific Science Congress, with Dr. C. B. Lipman, of the University of California, as chairman; Dr. Roy E. Clausen, of the same institution, as secretary, and with representatives of Stanford University, the University of California and the Golden Gate International Exposition as members. Dr. Ross G. Harrison, chairman of the National Research Council, was president of the congress, and Dr. Roy E. Clausen, secretary-general. Dr. Frank R. Lillie, retiring president of the National Academy of Sciences, was honorary chairman; Dr. Robert Gordon Sproul, president of the University of California; Dr. Ray Lyman Wilbur, president of Stanford University, and the presidents of previous congresses were honorary vice-chairmen.

The sixth Pacific Science Congress was the first meeting of the Pacific Science Association to be held on the mainland of the United States of America.

Within the lamp coil was centered a cylindrical quartz vessel (3.5 cm i.d. and 10 cm high), which contained between its walls a 1 cm layer of dry chlorine at 1 atmosphere. This layer of chlorine absorbed 94 per cent. of 297 and 366 mμ and even more of the light between these wave-lengths.[3] Glacial acetic acid (reagent quality) was discolored when it was used as a filter for several days and then absorbed strongly λ, 254 mμ. It was not improved when refluxed over chromic anhydride (reagent quality) and then distilled in vacuum.

The system to be illuminated was placed in a quartz reaction cell centered on the axis of the light filter, so that the lamp light could reach the cell only by passing through the filter.

The lamp reached equilibrium with its surroundings after it had been lighted half an hour. When it was stopped momentarily to introduce a new cell, equilibrium was reestablished by relighting the lamp ten minutes before illuminating the photo-sensitive system. Subsequent fluctuations in the light intensity then remained within less than 5 per cent. over at least twenty hours.

Ultra-violet light reaching the reaction cell was over 95 per cent. of λ, 254 mμ, as observed from spectrograms of the light before and after it traversed the layers of chlorine and water. Other observations[4] have shown that a mercury resonance lamp emits light which is over 82 per cent. of λ, 254 mμ. When the lamp was operated in air, an odor of ozone was produced by light at λ, 185 mμ and shorter wave-lengths;[5] but the 2 cm layer of water, between the lamp and reaction cell, absorbed this light as well as most of the infrared.[6] Visible light reaching the reaction cell usually can be ignored by properly adjusting the concentrations of the light-absorbing species when their extinction coefficients are greater at λ, 254 mμ than in the visible.

The light flux was measured with the dilute solutions of uranyl oxalate recommended for use as actinometers.[7] These solutions were stirred with a thin ribbon of transparent quartz in the form of a screw turning at more than 500 r.p.m. Care was taken not to let a large fraction of the actinic light reach the stirrer in order to avoid the difficulties of evaluating corrections for scattered light, particularly when the reaction under investigation depended upon the light intensity. To realize this the stirrer was kept half a centimeter from the part of the cell wall holding the solution. Here, the cell was 1.3 cm i.d. and 8 cm long; one end was fuzed shut and the other end was fuzed to 6 cm of .7 cm quartz tubing to minimize evaporation of the actinic solution. The volume of the solution, in this case, happened to be 11 cc, but smaller or larger volumes also would have intercepted the light fluxes given below, merely by changing the diameter of the cell and, if necessary, that of the stirrer. A light-proof aluminum tube that slipped over the cell acted as a shutter. The temperature was controlled by regulating the temperature and rate of flow of the air or water surrounding the lamp, filter and the reaction cell.

When the ensemble was used in air, 5×10^{19} photons of λ, 254 mμ were incident per minute on the actinometer; in distilled water there were 4×10^{19} photons; and in running Cambridge tap water 10^{19}. These values of the light flux in air and distilled water are over two hundred times greater than the light flux that has been obtained at λ, 254 mμ from a monochromator.[8] The light intensity was diminished further, when desired, by surrounding the filter with a wire gauze of the proper mesh, and could be increased by winding the lamp coils closer together and surrounding them with polished aluminum or some other suitable mirror.

LAWRENCE J. HEIDT

CAMBRIDGE, MASS.

[3] Gibson and Baylies, *Phys. Rev.*, 44: 188, 1933.

[4] Avery and Forbes, *Jour. Am. Chem. Soc.*, 60: 1006, 1938; and Cline and Forbes, *ibid.*, 61: 716, 1939.

[5] Flory, *Jour. Chem. Phys.*, 4: 23, 1936.

[6] I. C. T., 5: 271.

[7] Forbes and Heidt, *Jour. Am. Chem. Soc.*, 56: 2363, 1934. A more sensitive actinometer that can be used advantageously for very low light intensities has been studied carefully by Harris and Kaminsky, *ibid.*, 57: 1154, 1935.

[8] Forbes and Brackett, *Jour. Am. Chem. Soc.*, 53: 3973, 1931.

Errata: In the article by Dr. H. Waelsch and Dr. D. Rittenberg entitled "The Metabolism of Glutathione," printed in the issue of SCIENCE for November 3, the last line on the second column on p. 423 should read "6 mg" of copper glutathione instead of "16 mg."

In the article by Drs. Casimir Funk and Ian Casimir Funk printed in the issue of SCIENCE for November 10, on p. 445, the last line of Table V, "I" Stilbestrol should read "II" Stilbestrol.

BOOKS RECEIVED

EVE, A. S. *Rutherford.* Pp. xvi + 451. Illustrated. Macmillan. $5.00.

LOWENBERG, MIRIAM E. *Your Child's Food.* Pp. ix + 299. Illustrated. Whittlesey House, McGraw-Hill. $2.50.

MCMINN, HOWARD E. *An Illustrated Manual of California Shrubs.* Pp. ix + 689. 775 figures. J. W. Stacey, Inc., San Francisco. $5.00.

Storrs Agricultural Experiment Station. *Studies of Suburbanization in Connecticut; 3, Wilton; a Rural Town Near Metropolitan New York,* by NATHAN L. WHETTEN. Pp. 132. 19 figures. Connecticut State College.

TWENHOFEL, W. H. *Principles of Sedimentation.* Pp. v + 610. 44 figures. McGraw-Hill. $6.00.

WHITTLESEY, DERWENT. *The Earth and the State; a Study of Political Geography.* Pp. iii + 618. 85 figures. Holt. $3.75.