about platform sedimentation in other regions and the drawing of analogies with the mid-Saharan situation. Bigarella presented a fine series of slides of the South American and South African Carboniferous and earlier Paleozoic glacial records, and demonstrated definitive methods for recognizing the various environments of cross-bedding by the geometry of the fine structure. Bogdanov spoke on the Russian craton. And André Vatan (France) spoke on Iran. The Permian glaciation of Australia, traces of which occur in every state of the Commonwealth, was summarized by Fairbridge. Tasmania was possibly unique in having Precambrian, Permian, and Pleistocene glacials (and incidentally separated by periods of subtropical climate). Polar shift should never be regarded as a "one-shot" affair. Fairbridge spoke also on the origin of ice ages. He supports the old Lyell-Ramsay relief theory which argues that when the global paleogeography leads to a blocking of oceanographic circulation (as in the blocked radiator of a car) the heat balance becomes upset; when poles coincide with open seas there is no ice age, but when wide continental and mountainous areas come to coincide with poles, the snows of winter do not melt and the Kukla albedo theory takes over. Cyclism of 25,000 to 90,000 years is introduced by celestial mechanics (the Milankovitch theory) and short-term modulations are superimposed by solar variations of the ultraviolet transmission (and thereby the ozone density in the stratospheric "greenhouse").

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Courses

Basic Processes in Neuronal Networks, Avalon, Calif., 22 June–25 July. This course will be devoted to the study of basic neuronal mechanisms operating at the cellular and small network level. Emphasis will be placed on direct experimental demonstration of the properties of membranes and synapses, receptors and receptor networks, networks for control of motor function, pattern generation in networks, and learning in simple networks. (Dr. Russell L. Zimmer, Resident Director, Santa Catalina Marine Biological Laboratory, P.O. Box 398, Avalon, Calif. 90704)

X-ray Spectrometry, Albany, N.Y., 8–19 June (two sessions). This is an integrated course in the fundamentals, applications, and advanced techniques of x-ray spectrometry, including computer automation methods. The course covers the complete range of x-ray spectrometric techniques and theory from beginning elementary principles to the most advanced methods and latest developments. Is intended for those who are working or intend to work in x-ray spectrometric analysis. The course was established to meet the increasing demands of the x-ray spectroscopist who requires an introduction and thorough grounding in basics and for the spectroscopist who wants to expand his capabilities. Persons may register for individual sessions or for the entire 2-week course. Session 1 (8–12 June) will cover fundamentals, experimental techniques and procedures of x-ray spectrometry. No previous knowledge or experience is required or assumed. Session 2 is a continuation of fundamentals, advanced methods, and recent developments. A background equal to Session 1 is assumed. *Tuition*: $250 per session; $450 for both sessions. (Physics Department, State University of New York at Albany, Albany 12203)

Wear in Theory and in Practice, Cambridge, Mass., 22–27 June. This course will deal with wear—a description of the various forms of wear, an evaluation of the equations for analyzing wear quantitatively, and a discussion of methods available for minimizing the amount of wear and the size of wear debris. Related topics like friction, sliding temperatures, and lubrication will be covered. Experimental techniques will be demonstrated and their application to solving industrial problems will be stressed. (Director of the Summer Session, Room E19-356, Massachusetts Institute of Technology, Cambridge 02139)

Odor Perception: Multidisciplinary Research Methods, Utrecht, Netherlands, 23 August–5 September. The physicochemical, biological, physiological, and psychological methods in olfactory research will be demonstrated and discussed. It will be organized in the form of a large experiment in which all these methods will be applied to a central problem—odor mixing. The course is open to chemists, biologists, physiologists, and food technologists with an active interest in the fundamental problems of olfaction. [Dr. J. Wiederhold, Course Registrar, Netherlands Universities Foundation for International Co-Operation (NUFFIC), 27 Molenstraat, The Hague, Netherlands]

Design and Analysis of Scientific Experiments, Cambridge, Mass., 6–17 July. This course will focus on factorial designs with each factor at two or at three levels. Applications will be taken from the physical, chemical, biological, and medical sciences, as well as from engineering and development. (Director of the Summer Session, Room E19-356, Massachusetts Institute of Technology, Cambridge 02139)

Laser Raman Spectroscopy, College Park, Md., 8–12 June. Is intended for participants from industrial, government, and academic laboratories. Topics include the theory of Raman spectroscopy, applications to studies of molecular structure and dynamics in single crystals, polycrystalline and amorphous materials, liquids and gases, correlation with infrared spectra, and recent advances in instrumentation and microsampling techniques. Stress is placed on developing an understanding of fundamentals. (Prof. Ellis R. Lippincott, Center of Materials Research, University of Maryland, College Park 20742)