

MEETINGS

Latin-American Cosmic-Ray Symposium

SUBSTANTIAL advances in Latin-American cosmic-ray research were reported at the Curso Latinoamericano de Radiacion Cosmica in Mexico City, which took place during the period from June 26 to July 5, 1961. Convened by the Consejo Latinoamericano para Radiacion Cosmica (CLARC), the symposium was held in the Van de Graaff building on the beautiful campus of the National University of Mexico. It was sponsored by UNESCO, the Comision Nacional de Energia de Mexico, and the US Space Science Board. The symposium concentrated on the solar and geophysical aspects of cosmic rays that have come to the fore thanks to the IGY and the advent of satellites and space probes. The galactic cosmic radiation, however, was not neglected.

A number of invited lectures summarized the current state of cosmic-ray research. D. Menzel of Harvard College Observatory discussed the nature of solar activity. S. Korff of New York University and W. Hess of NASA reviewed the measurements of neutron intensity in the atmosphere and in space. M. M. Shapiro of the US Naval Research Laboratory lectured on the composition and origin of the galactic cosmic rays. M. S. Vallarta and R. Gall of the National University of Mexico reviewed geomagnetic theory, including secular variations of the earth's field, albedo cones, and corrected shadow cones. H. Elliott of Imperial College, London, lectured on solar modulation and described projected cosmic-ray measurements in the US-UK Scout I satellite. V. Regener of the University of New Mexico spoke on transistorized circuitry for cosmic-ray research and on solar-diurnal variation of cosmic rays underground at Chacaltaya, Bolivia. G. Schwachheim of the Centro Brasileiro de Pesquisas Fisicas discussed solar radio astronomy.

Among stimulating seminars, presented mainly by the Latin-American participants, were the following: interpretation of the July 1959 and November 1960 events in terms of cosmic-ray modulation mechanisms, by J. Roederer, H. Ghielmetti, J. Cardoso, J. Manzano, and O. Santochi of the Universidad de Buenos Aires, Comision de Energia Atomica Argentina, and Universidad de Tucuman; determination of primary nuclei of high charge ($Z \geq 26$) in the primary cosmic radiation, by G. Alvial, S. Stantic, and J. Riquelme, Universidad de Chile; recovery characteristics of Forbush effects, by I. Escobar, N. Nerurkar, O. Troncoso, and M. Zubieta, Universidad Mayor de San Andres, Bolivia; on the nature of solar emission of ionized matter associated with Forbush effects, by I. Escobar *et al.*; delayed particles in extensive air showers, by P. J. Eccles, Massachusetts Institute of Technology; and extensive air-shower experiments in Bolivia, by K. Suga, I. Escobar, G. Clark,

and W. Hazen, Universidad Mayor de San Andres, University of Tokyo, MIT, and University of Michigan. The purpose of this collaborative experiment is to detect air showers initiated by primary gamma rays. The equipment should be completed within a year. Finally, R. Gall of the University of Mexico reported on Stormer's inner allowed regions, the radiation belts, and quasi-trapped orbits.

M. Sandoval Vallarta (president of CLARC) and Juan Roederer (secretary) were responsible for the excellent organization of the symposium. The Board of Councilors of CLARC comprises Ismael Escobar (Bolivia), Georges Schwachheim (Brazil), Gabriel Alvial (Chile), Alberto Giesecke (Peru), Leticia del Rosario (Puerto Rico), and Manuel Bemporad (Venezuela).

Maurice M. Shapiro

US Naval Research Laboratory

O. Lyle Tiffany

Bendix Systems Division

Theory of Weak and Strong Interactions

AN International Conference on the Theory of Weak and Strong Interactions took place June 14-16, 1961, at the Department of Physics of the University of California, San Diego, in La Jolla. The conference was attended by about 75 theoretical high-energy physicists. An informal atmosphere prevailed, quite conducive to discussion. The meeting was supported by the International Union of Pure and Applied Physics, the National Science Foundation, the Office of Naval Research, and the Atomic Energy Commission.

The scientific program* began on Wednesday morning with talks by M. Gell-Mann, A. Salam, J. J. Sakurai, S. Okubo, and Y. Nambu on attempts at unified theories of the elementary particles. Gell-Mann discussed a general description of the currents in the system of strongly interacting particles and their connection with vector mesonic states, on the one hand, and with symmetries or broken symmetries on the other. Sakurai emphasized the vector meson theory of strong interactions quite apart from arguments based on invariance. He listed several very tentative experimental indications that the relative Σ - Λ parity is odd. If this is indeed the case, it will invalidate many of the symmetric models of strong interactions. Salam discussed these vector meson theories from the point of view of renormalizability. He showed that as soon as mass terms are introduced for these mesons, the theories become unrenormalizable. He proposed an alternative method for simultaneously breaking symmetries and giving masses to vector mesons. Okubo speculated that a unified description of the elementary particles must exist, based on an analogy between the baryon triplet (Λ , n , p) and the lepton triplet (μ , e , ν). Finally, Nambu discussed three-dimensional unitary symmetry in the superconductive theory of baryons, showing that the sym-

* Readers who are interested in obtaining a more extended summary of the talks than can be offered here should write to the Secretary, Department of Physics, University of California, San Diego, La Jolla, California.