and *mesotron*) on a tentative basis until the next General Assembly.

The Commission on Units of Radioactivity recommended that "international curie" be defined as the quantity of radioactive substance which gives 3.60 times ten to the tenth disintegrations per second. There was also a request from a certain member of the Commission that the name "neocurie" be given to ten to the sixth disintegration per second. This proposal has a long history which it is not worth while to relate in this place. The proposal was neatly circumvented at the meeting of the Commission, which eventuated in a recommendation to the International Council of Scientific Unions that a Joint Commission be formed, depending on both our Union and the International Union of Chemistry *and having ours for its mother-union*, the subject of which could be "the study of units, constants, standards and nomenclature of radioactivity." Unfortunately it now appears that the arguments of our representatives did not prevail on the International Council, which in September formed a joint commission having the Union of Chemistry as its "mother-union," and restricted in its title to "standards and units of radioactivity." Since each of the two unions is to have six members in the joint commission, it is perhaps unimportant which of the two is designated as "mother-union." At any rate, the question of the name (if it be worth while to give a name) of ten to the sixth disintegrations per second is now referred to the Joint Commission.

The affiliation of the International Commission on Optics was approved. This Commission met separately at Delft, and a report of its activities has been furnished from another source.

The Union recommended that every original article on physics be preceded by an abstract in either English or French, and rather vaguely implied that abstracts supplied by authors should be critically reviewed and amended by editors. It expressed the hope that eventually there will be two abstract journals, one in English and one in French, containing abstracts of all original articles on physics. It advises the editors of Reviews of Modern Physics, Progress Reports (of the Physical Society of London) and similar journals elsewhere consult with one another to ensure "that articles on a given subject do not appear simultaneously and also that important subjects are not overlooked." It suggests to the International Council and the Union of the History of Science that the development of physics since the death of Newton is worthy of more attention than it has so far received.

New or re-elected officers of the International Union of Pure and Applied Physics, with terms extending to the next General Assembly (probably not to be held until 1951) are: H. A. Kramers, president; P. Fleury, secretary-general; E. Amaldi, G. Bialobrzeski, K. K. Darrow, Charles Darwin, P. P. Ewald, C. J. Gorter, J. C. Jacobsen, P. Scherrer, J. C. Slater, vice-presidents; E. Bauer and C. J. Gorter, members of the Financial Committee. The office of treasurer is discontinued; the secretary-general (P. Fleury, 3 boulevard Pasteur, Paris 15, France) will assume the duties of the treasurer. It is flattering that the United States is honored, and is the only country honored, by the election of *two* vice-presidents from among its citizens. American members of the various commissions are: F. G. Brickwedde on the SUN Commission, J. A. Beattie and J. E. Mayer on the Commission on Thermodynamics and Statistical Mechanics, C. D. Anderson on the Commission on Cosmic Rays, E. U. Condon on the Joint Commission on Physico-Chemical Data, G. Failla on the Commission of Radiobiology and L. F. Curtiss and R. D. Evans on the proposed joint commission on the units, constants, standards, and nomenclature of radioactivity.

A letter circulated by P. Fleury before the meeting showed that the Union is essentially dependent on UNESCO, whose contribution of $15,300 for 1948 surpassed by manyfold all the contributions from the governments of the participating nations. This sum was allotted as follows: $5500 to travelling-expenses of officers of the Union and members of commissions to Amsterdam or Delft; $600 to travelling-expenses of president and secretary-general; $2000 to travelling-expenses of delegates to the nearly-simultaneous congress on the physics of metals; $3200 to publications and $4000 to grants to physicists for foreign travel. In addition the Union had $2734 left over from the subsidy of the previous year, which in April its officers were planning to use toward the expenses of a meeting at Amsterdam intended to organize a later meeting on low temperatures.

—Karl K. Darrow

APS at Berkeley

The 290th meeting of the American Physical Society was held in Berkeley, California, from February 3 to 5, 1949. It was attended by over two hundred fellows and members of the Society, the largest attendance on record for a West Coast meeting. This remark occurs regularly in describing successive meetings, and is good evidence of the growing membership of the Society.

The sessions were held at the University of California's LeConte Hall, the building of the physics department, where the department members and the radiation laboratory staff acted as hosts to the gathering. The size of the attendance was still manageable and this contributed very much to the pleasant atmosphere which allowed useful exchanges of ideas and smaller gatherings among people interested in some special subjects.

The first morning was devoted to two invited papers on molecular and chemical physics and to some contributed papers on theoretical physics and x-ray physics. The afternoon meeting opened with two invited papers on the emission of protons and deuterons by carbon under ninety Mev neutron bombardment. The emission of deuterons and several of the detailed features of this phenomenon are somewhat different from what one would expect on the basis of extremely simple schematizations, and the experimental observations and the theory, both incomplete for the time being, were presented. This was followed by a series of contributed papers on geomagnetic and atmospheric effects in cosmic rays. These were characterized by admirably high accuracy in the experimental

technique, and have interesting implications for the total energy balance of the radiation crossing the atmosphere.

Friday morning was devoted mostly to theoretical papers on mesons. The recent advances in the experimental results are most easily interpreted by admitting that the mu meson has spin ½ and the pi meson has spin 0 or 1. The main argument for this conclusion rests on the apparent fact that the pi meson disintegrates into a mu meson and a particle of rest mass zero (neutrino) and that the spectrum of the disintegration electrons of the mu mesons is a continuum with an upper energy limit of about fifty-five Mev. Convincing experimental evidence for both these facts was presented in one of the Saturday afternoon meetings; it comes from investigations on both artificial and cosmic ray mesons.

A supplementary paper announced the successful operation of the three hundred Mev synchrotron. Several mesons, apparently produced by gamma rays, have been observed by the photographic plate technique. Not to be outdone, the one hundred and eighty-four inch cyclotron has been converted to proton operation and three hundred and fifty Mev protons, and very high energy secondary neutrons have been produced. The neutrons have sufficient energy to produce artificial mesons of which cloud chamber pictures (the first ever made of artificial mesons) have been obtained. Friday afternoon was devoted to an invited paper and several contributed papers on the mechanisms of electrical gas discharges and on scintillation counters. On Saturday, besides the interesting meson papers already mentioned, there was a morning session devoted to high precision nuclear spectroscopy of the light nuclei. Among other things, the change of the neutron mass to 1.00899, recently reported, was independently confirmed in a supplementary paper. In a parallel session, papers on nuclear systematics, excitation functions and scattering experiments, were reported. Notable among these were the first results on proton-proton scattering at thirty-two Mev.

This brief account cannot cover all the subjects treated. In spite of a preponderance of nuclear and high energy physics there were also interesting results on the properties of helium-three to be interpreted as a confirmation that its strange behavior is due to the Bose-Einstein condensation, an investigation of liquids by neutron diffraction, and some papers of biological and other interest.

Socially the meeting was enlivened by an evening spent by a good fraction of the attendance at a dinner slightly less sedate than usual for a learned society, by the pleasant luncheons, and by informal gatherings which gave occasion to renew old acquaintances and friendships.

—Emilio Segrè

Reactor Program

Recent disclosures have further outlined the character of the Atomic Energy Commission's reactor development program. In addition to those nuclear reactors already in operation or under construction the program provides for the development of four particular types of test reactors, each of which is expected to provide a substantial fraction of the knowledge which future atomic energy development will demand. Two reactors are to be constructed at an unidentified location in the western United States, where a new and major AEC laboratory site is to be prepared for the specific purpose of developing and testing atomic piles. This establishment will be primarily a field station for the Argonne National Laboratory, the present nucleus of the Commission's reactor program, although its facilities also will be available to the Oak Ridge National Laboratory, the Knolls Atomic Power Laboratory, and a few others.

As announced late last year, Westinghouse Electric Corporation has been awarded a contract to construct one of these reactors, a dry-land model of a nuclear propulsion unit for naval vessels. The nuclear fuel to be used is uranium enriched with uranium 235. The navy reactor is still in the planning stage, but the possibility has been voiced that actual construction of the unit may begin in about one year.

A second pile intended for operation at the new western site is to be used primarily for testing materials as possible structural components for future reactors. Its fuel is also to be enriched uranium, and it will act as a strong neutron source for investigating the effects of intense neutron bombardment of these various materials. The very high neutron flux of this pile will make it a valuable research tool, and it has been stated that it will be used for various physical and chemical experiments. North American Aviation, Inc. has contracted to study reactor materials and components "suitable for the practical application of atomic power," according to a recent AEC announcement. Construction of the materials-testing reactor is expected to begin before the end of the year.

Argonne has the responsibility for designing both of these reactors, and also an experimental breeder pile intended to test the feasibility of operating a uranium reactor in such a way that more plutonium is produced than uranium 235 is consumed, and at the same time operating the reactor in a way that will provide a limited source of electrical power. Although it will run at fairly low power, it is reported that the level will still be high compared to that of the Los Alamos plutonium fast reactor. As in the case of the Los Alamos reactor, it will operate with high energy neutrons. R. F. Bacher, in speaking before the American Academy of Arts and Sciences in February, has suggested the desirability of using a liquid metal coolant which will minimize neutron absorption losses and which at the same time will, by rapid transfer of heat from the reactor, permit operation at a temperature level which may allow an effective conversion of heat energy into electrical energy. The location of this pile has not been specified.

The Commission's program also includes the construction of another breeder type reactor. It is now being designed at the Knolls Atomic Power Laboratory in Schenectady operated by the General Electric Company, and will work with medium energy neutrons, a circumstance which makes it unique among reactors. Since no such intermediate reactors have existed heretofore, it is a matter of some interest to discover its behavior during operation. Here also it is planned that the coolant be liquid