mixture and at its contact with a solid catalytic agent, are actually in accord with the mass law. He found that the equilibrium between an ester, ethyl acetate and acetic acid, alcohol and water gives a much higher percentage of ester in the vapor than in the liquid phase, so in the preparation of esters it is often advisable to distil off vapor from the liquid and allow time for the attainment of equilibrium in the vapor before it is condensed. A. P. Mathews, of the University of Cincinnati, presented an interesting paper on the nature of electricity and light. He gave a theory of the nature and origin of the positive and of the negative electron.

H. W. Rodehamel, of Indianapolis, described the methods usel by Eli Lilly and Company for the purification of insulin, and gave an account of the use of this substance in the treatment of diabetes. He told of the case of a small boy who had been given an injection of insulin to care for the sugar of his evening meal, but who failed to get the meal and was found unconscious on the floor of his room. His mouth was pried open, and a small amount of sugar administered in the form of orange juice. Within ten minutes the boy was playing as usual. The speaker stated also that when rabbits become unconscious from the same cause they are given an injection of sugar solution in one ear, and that the effect is so rapid that often the rabbit will jump up and away from the syringe before there has been time to inject the full dose. H. A. Shonle and J. H. Waldo, of the same company, presented data which indicate that insulin is a protease. In work done at the University of Cincinnati it was found that insulin can be purified by absorbing it from solution upon charcoal and afterwards causing it to be released by a change of solvent, or by using a substance which is absorbed more highly.

W. H. Rodebush believes that a radical revision of the ordinary course in physical chemistry would be of considerable benefit to the student. He considers that more time should be given to the study of atomic structure, statistical mechanics and thermodynamics, and less to the study of solutions, deviations from the gas laws, determination of molecular weights and some other topics that are overemphasized; since the relative importance of the latter has been greatly reduced by the recent remarkable developments in connection with the structure of the atom and the molecule. W. Lash Miller stated that much confusion has been introduced into thermodynamics by recent attempts to simplify the subject, particularly by the transfer of the term "free energy" from its ordinary use by Helmholtz to the zeta function of Gibbs. He considers that the psi, chi and zeta functions of Gibbs should be used without any change of terminology.

Many papers of interest, other than those mentioned above, were presented at the meeting. Some of these will be published in SCIENCE. The titles are given below:

On the composition of animal skin and some characteristics of animal skin: GEORGE D. MCLAUGHLIN and EDWIN R. THEIS, University of Cincinnati.

The occurrence of bile salts in the blood: SHIRO TASHIRO, College of Medicine, University of Cincinnati.

On the relation of vitamine B to anaphylaxis: PAUL WEDGEWOOD, College of Medicine, University of Cincinnati.

On the color change of Congo red: J. M. FOULGER, College of Medicine, University of Cincinnati.

On the silicon content of tissue: MOSES ISAACS, College of Medicine, University of Cincinnati.

The alkaloid content of Phytolacca decandra as affecting its use as a salad: H. A. WEBB and M. J. COX, George Peabody College for Teachers.

A study of some hydroxyurethanes: R. E. OESPER and WALTER A. COOK, University of Cincinnati.

New hydroxyurethanes and their conversion to hydroxylamine derivatives: LEONORA NEUFFER and ANNA L. HOFFMANN, University of Cincinnati.

The liberation of hydrogen from carbon compounds: H. S. FRY, University of Cincinnati.

The use of medicated and disinfecting soaps: L. W. BOSART, Proctor and Gamble Co.

Rays of a new type and photographic tests of atomic stability: WILLIAM D. HARKINS, University of Chicago.

Equilibria in mixtures of lactic acid and its anhydrides: G. A. THURMOND, University of Cincinnati.

Some recent developments in sugar chemistry: C. A. BROWNE, Chief, U. S. Bureau of Chemistry.

The subject of a course in physical chemistry (a critical review of recent progress): W. H. RODEBUSH, University of Illinois.

The chemistry of explosives: C. A. MUNROE, Washington, D. C.

Report of progress in the separation of the isotopes of chlorine, mercury and zinc, and the general system of isotopes: WILLIAM D. HARKINS, University of Chicago.

Lipoids, a factor in gluten quality: EARL B. WORKING, Kansas State Agricultural College.

SECTION D (ASTRONOMY)

Vice-president and chairman, Heber D. Curtis.

Retiring vice-president, Otto Klotz.

Secretary, F. R. Moulton, University of Chicago, Chicago, Ill.

(*Report by F. R. Moulton*)

The program of Section D, on Friday and Saturday forenoons and Friday afternoon, consisted of a symposium on the "Infinity of the physical universe,"

another symposium on the "Reform of the Calendar," and a number of miscellaneous scientific papers. Although the American Astronomical Society was holding its annual meeting at Poughkeepsie, N. Y., at the time, the sessions of Section D were well attended and aroused much interest, especially the first symposium. The discussion of the question of the infinity of the physical universe was introduced by Professor F. R. Moulton, of the University of Chicago. The speaker explained that the question was one to which no definite and final answer can be given either now or in the future. Nevertheless the subject deserves discussion, because it is one which the human mind ever persists in attacking; it has powerful influence on our general philosophy of science, and the ideas of astronomers respecting the extent of the visible universe and the duration of celestial bodies are now undergoing rapid expansions. It was explained that if the universe is built up of an unending succession of cosmic units which at each stage make larger units, as electrons make up atoms, atoms make up molecules, molecules make up worlds, worlds make up solar systems, solar systems make up galaxies, galaxies make up super-galaxies, and so on—each unit separated from its neighbors by distances that are great compared to their diameters—then the universe is not only infinite in extent, but it has an infinite number of each type of cosmic units, the total mass is infinite, there is no center or absolute position in it, and it may have infinite duration, both past and future. Although there can be no absolute proof of the soundness of such a conclusion, the speaker adopted as a working hypothesis that the physical universe is infinite in space and in time, and that all phenomena are in a general way cyclical. Professor Wm. D. MacMillan, of the University of Chicago, continued the discussion and made clear the rôle played by postulates in scientific theories, particularly in the one under discussion. He enumerated certain postulates that he wished to adopt and agreed with the first speaker in accepting the hypothesis that the universe is infinite in space and time. The relationship of the doctrine of general relativity to the question was discussed by Dr. Horace Levinson, of Ohio State University. Dr. Levinson explained the basis of the Einstein theory, the meaning of the curvature of space, the different forms of the solutions that have been found for the Einstein differential equations, and the astronomical consequences of the different solutions. He made clear the fact that the implications of the Einstein theory that bear on this question are neither fully developed nor unique.

The reform of the calendar was discussed by Mr. M. B. Cotsworth, secretary of the International Fixed Calendar League; Dr. Charles F. Marvin, Chief of U. S. Weather Bureau; Professor Benjamin F. Yanney, of Wooster College, Ohio, and other speakers. The grave defects and inconveniences of the present calendar were pointed out, and the simplicity of a calendar consisting of thirteen months of four weeks each was explained. An interesting feature is that, in order that the same dates shall fall on the same day of the week on successive years, it is necessary to have one "skip day" in each ordinary year, the last one in the year, that does not have a week-day name, and two such days on leap years. In spite of the fact that this interrupts the regular recurrence of the Sabbath on every seven days, the plan has received the highest ecclesiastical indorsement all over the world. It is also supported widely by commercial and governmental agencies. An international conference on the subject will be held in Geneva, Switzerland, next summer, and it is hoped that concerted action will be taken at that time.

Professor E. S. Manson, of Ohio State University, established the famous solutions of the problem of three bodies, due to Lagrange, by a method whose directness and simplicity leave nothing to be desired. Professor W. Carl Rufus, of the University of Michigan, gave a new and simple method of determining the character of the oscillations of Eta Aquilae and other variable stars of the Cepheid type. Dr. Elliott Smith, of the Cincinnati Observatory, gave an interesting illustrated paper on the effects of non-luminous matter in reducing and cutting off the light of the stars. Dr. Louis A. Bauer, of the Carnegie Institution of Washington, gave a paper on the relations between solar activities and terrestrial magnetic and electric phenomena. He presented evidence of an annual period in the solar activity.

A telegram announcing the death, on December 28, of Dr. Otto Klotz, eminent director of the Dominion Observatory, Ottawa, Canada—who would have given the retiring vice-presidential address at this meeting of Section D, had his health permitted, almost on the hour at which he passed away—cast a shadow over the meeting of the section.

SECTION E (GEOLOGY AND GEOGRAPHY)

Vice-president and chairman, Nevin M. Fenneman.
Retiring vice-president, H. W. Shimer.
Secretary, Elwood S. Moore, University of Toronto, Toronto, Ontario.

(Report by E. S. Moore)

The celebration of the seventy-fifth anniversary of the association added greatly to the importance of the Cincinnati sessions of Section E, which were unusually successful. Friday was devoted to joint sessions with the Association of American Geographers, arranged with the kind cooperation of Richard E. Dodge, secretary of that association. Two of the outstanding papers presented were those of T. C. Chamberlin, on

SECTION D (ASTRONOMY)

F. R. Moulton

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