

Society the following account of Professor Musil's work:

Professor Musil is now recognized as the foremost living authority on the topography, history and folklore of the desert tracts lying between the settlements of Palestine and Syria on the west, the Tigris on the east, and the oases of Nejd on the south. Since 1896 he has spent many seasons in the field in the course of journeys on camel-back covering a total distance of no less than 13,000 miles. An extremely close observer, Professor Musil has recorded on his maps detailed topographic features and place-names over broad districts previously wholly unexplored. By comparing the results of his field work with the ancient documentary sources, he has been able to reconstruct the probable course of historical events that have hitherto proved enigmas to students of the Old Testament, and to Assyriologists, classicists and Arabicists. His most sensational discovery was made in 1898 on the edge of the desert east of the Dead Sea. Here he found the Kuseyr 'Amra, well-preserved ruins of a summer residence built by the Omayyad caliph Walid II in the eighth century of our era. The interior walls of this structure were decorated with paintings illustrating the adventures of the caliph in the hunting field and with portraits of the fallen rulers of the various countries which had been brought under Moslem subjection—among them one of Roderick, the last Visigothic king of Spain. From the geographical point of view Professor Musil's most striking work was the determination of the position of the main watershed of northern Arabia and the exploration of the fringes of the Nefud, or great sand waste that lies between Nejd and the Hamad steppes (sometimes called the Syrian desert). Professor Musil also traced the lower course of the River Tharthar, in the interior of Mesopotamia, to its outlet in an unexplored salt lake on the floor of a depression fifty meters below sea-level. Reports of this stream may have given rise to the classical legend of Tartarus, river of the underworld.

Professor Musil has made an extremely important contribution to our knowledge of Bedouin folklore. Accepted as a member of the Rwala tribe, on equal terms with their head chief, he was enabled to study the life of these nomads in its minutest details. He records, translates and explains several hundred of their songs in his volume, "The Manners and Customs of the Rwala Bedouins."

The results of Professor Musil's researches prior to 1908 were published in two great series by the Vienna Academy of Science: "Kusejr 'Amra" (in 2 volumes) and "Arabia Petraea" (in 4 volumes); the latter is accompanied by a map of Arabia Petraea on the scale of 1:500,000. His field work of 1908-1915 is described in a series of six volumes, the publication of which by the American Geographical Society has been made possible through the generosity of Charles R. Crane, Esq. Five of these six volumes are devoted to the narratives of the explorer's itineraries and to historical essays on the various regions visited. Three volumes are now in print ("The Northern Hegâz," 1926; "Arabia Deserta," 1927, and "The Middle Euphrates," 1927). Two more will be published in the course of 1928 ("Palmyrena"

and "Northern Negd"), and the sixth volume of the series ("The Manners and Customs of the Rwala Bedouin") will also appear before the close of the present year. Forming an integral part of this series are three maps: The Northern Hegâz, 1:500,000; Northern Arabia, in four sheets, 1:1,000,000, and Southern Mesopotamia, 1:1,000,000.

## NATIONAL RESEARCH FELLOWSHIPS IN THE BIOLOGICAL SCIENCES

THE Board of National Research Fellowships in the Biological Sciences met on February 10 and 11 and made the following awards for the year 1928-29:

### *Reappointments*

Kenneth Cole—Biophysics  
Robert Emerson—Botany  
M. B. Linford—Botany  
Louis W. Max—Psychology  
G. G. Pincus—Zoology  
Jack Schultz—Zoology  
B. H. Wallace—Botany

### *New Appointments*

F. M. Carpenter—Zoology  
F. E. Clements—Anthropology  
S. H. Emerson—Botany  
Eileen W. Erlanson—Botany  
Clay G. Huff—Zoology  
C. F. Jacobsen—Psychology  
D. A. Johansen—Botany  
P. A. Readio—Zoology  
D. C. Smith—Zoology  
M. T. Sonneborn—Zoology  
R. C. Tryon—Psychology

The second meeting of the board for further appointments for 1928-29 will be held the latter part of May, and applications for consideration at that time are requested by April 15. The necessary forms and information for making application may be secured from the Secretary, Board of National Research Fellowships in the Biological Sciences, National Research Council, Washington, D. C.

FRANK R. LILLIE, *Chairman,*  
*Board of National Research Fellowships*  
*in the Biological Sciences*

## SCIENTIFIC NOTES AND NEWS

IN recognition of his research work in the field of catalysis, the Nichols medal was formally awarded to Dr. Hugh Stott Taylor, David B. Jones research professor of chemistry at Princeton University, on March 9. The presentation of the medal followed a dinner at the Chemists' Club, given by the New York section of the American Electrochemical Society, the Society of Chemical Industry and the Société de Chimie Industrielle. After speeches by Dean James Kendall,

of New York University, and Professor Wilder D. Bancroft, of Cornell University. Professor Arthur W. Thomas, of Columbia University, chairman of the jury of award, presented the medal to Professor Taylor, who then described his work on catalysis.

THE Messel Medal of the British Society of Chemical Industry has been awarded to Dr. R. A. Millikan, director of the Norman Bridge laboratory at the California Institute of Technology, in recognition of his achievement in measuring the electrostatic charge of the electron.

PROFESSOR W. H. WRIGHT, astronomer of the Lick Observatory, has been appointed George Darwin lecturer for 1928 of the Royal Astronomical Society. The lecture will be delivered in June, and will probably deal with the photography of the planets with different color filters.

DR. LAWRENCE J. HENDERSON, professor of biological chemistry at Harvard University, is giving the Silliman lectures for 1928 at Yale University on "Blood: A Study in General Physiology." The course will consist of six lectures, is given on Mondays, Wednesdays and Fridays, from March 12 to 23, inclusive.

DR. OYARTZUN, curator of the Anthropological Museum, Santiago, Chile, has been awarded the gold medal of the University of Würzburg.

DR. PAUL FLECHSIG, professor of psychiatry at the University of Leipzig, has been elected an honorary member of the Psycho-Neurological Academy of Leningrad.

THE rank of officer of the Legion of Honor has been conferred on Dr. Pierre Fredet, a well-known Paris surgeon and senior medical officer of the Paris, Lyons and Mediterranean Railway; Dr. Loeper, professor of therapeutics in the Paris faculty of medicine; Dr. Abadie, professor of nervous and mental diseases at Bordeaux, and Professor Léon Blum, of Strasbourg.

PROFESSOR CLEMENS PIRQUET, of Vienna, has been elected president of the International Union of Child Welfare in succession to the Duke of Atholl.

PROFESSOR WILLIAM H. WELCH, of the Johns Hopkins University, has been appointed a member of the Baltimore Revision Commission. The commission will consider the revision or amendment of the City Charter and the City Code.

DR. ELLIOTT C. CUTLER, of Cleveland, has been elected to succeed Dr. Montrose Burrows as chairman of the committee on the protection of medical research of the American Medical Association.

DR. RICHARD P. STRONG, professor of tropical medicine at the Harvard Medical School, was guest of

honor at a dinner given by the Harvard Union on March 1, where he exhibited moving pictures taken last year in Africa on an expedition under the auspices of the Medical School of Harvard University.

STANLEY P. YOUNG, of Colorado, has been appointed head of the division of economic investigations of the U. S. Bureau of Biological Survey, in charge of the department's rodent and predatory-animal control operations. He succeeds Dr. A. K. Fisher.

DR. OLIVER BOWLES, formerly supervising engineer of the Non-metallic Minerals Experiment Station of the U. S. Bureau of Mines at New Brunswick, N. J., has been transferred to the economics branch of the bureau to be chief of a new structural materials section, having charge of economic studies in the major non-metallic minerals and their products.

WILLIAM L. HALTOM has been appointed curator of the Alabama Museum of Natural History, to succeed H. E. Wheeler, resigned.

PROFESSOR RICHARD R. FENSKA is spending his sabbatical year from the New York State College of Forestry as forester for the Massachusetts Forestry Association.

RAYMOND L. DITMARS, curator of reptiles at the New York Zoological Park, sailed for Honduras on March 6, where he will collect poisonous snakes for the production of serum.

GREGORY MASON, explorer and author, sailed from New Orleans on February 7, at the head of an expedition being sent out by the Museum of the American Indian, of New York, to search for evidences of Mayan civilization.

PROFESSOR J. E. HOFFMEISTER, of the University of Rochester, and Professor H. S. Ladd, of the University of Virginia, will sail early in April for the South Pacific to continue geological field work begun in 1926. Professor Hoffmeister is studying the geology and paleontology of certain islands in the Tonga Group, while Professor Ladd is carrying on similar work in Fiji. They will return about the middle of September. The work is being done under the auspices of the Bernice P. Bishop Museum of Honolulu.

DR. STANLEY COBB, Bullard professor of neuropathology at the Harvard Medical School, is on leave of absence for the second half of the current academic year and will go to Munich to work in neuropathology and psychiatry.

AFTER nine months' absence in Africa, L. W. Kephart and R. L. Piemeisel, plant explorers of the U. S. Department of Agriculture, have returned with more than 160 lots of seed of different grasses and forage

plants and 400 specimens of other plant life. It is hoped that some additions to the pasture and meadow forage of the United States will result from this expedition.

MISS MARY PROCTOR, the astronomical author, arrived in New York on March 6 for an American lecture tour during which she hopes to raise money for the construction, probably in southern California, of the world's largest astronomical telescope.

DR. NILS G. HÖRNER, of Uppsala, Sweden, Scandinavian-American fellow, has spent the fall and winter as a visitor in the department of geology at Harvard University. He has recently been appointed a fellow of the Liljewalch fund of Uppsala University, which will enable him to make a geological excursion in Western United States beginning about March 15.

THE first lectures under the William Sydney Thayer and Susan Read Thayer lectureship in clinical medicine at the Johns Hopkins University School of Medicine will be delivered by Sir Humphry Rolleston, Regius professor of physic in the University of Cambridge, England, on March 20 and 21. The titles of the lectures are "Hereditary and Familial Diseases of the Blood Forming Organs" and "Diseases Peculiar to Certain Races."

DR. GEORGE BARGER, professor of medical chemistry at the University of Edinburgh and non-resident lecturer in chemistry at Cornell University during the present semester, will give three Dohme lectures at the Johns Hopkins University early in May.

THE annual William Lowell Putnam memorial lecture will be delivered on March 21 by Professor Constantin Carathéodory, of the University of Munich, who will speak on "Selected Problems in the Calculus of Variations."

PROFESSOR ALBERT EINSTEIN, of the University of Berlin, will deliver the inaugural lecture of a first course of international university extension lectures, to begin at Davos on March 18. The object of the institution is to enable students in delicate health to continue their studies in the Alps.

THE thirteenth Guthrie lecture of the British Physical Society was given by Sir Joseph Thomson, F.R.S., on "Electrodeless Discharge through Gases," on March 9, at the Imperial College of Science and Technology.

THE College of Physicians of Philadelphia will commemorate on March 22 the tercentenary of William Harvey's discovery of the circulation of the blood. Addresses will be delivered by Sir Humphry Rolleston, of Cambridge, England, and Professor J. J. R. Macleod, of Toronto. There will also be an exhibition of Harveyana.

ON February 29 the central Pennsylvania section of the American Chemical Society celebrated the one hundredth anniversary of the birth of Dr. Evan Pugh, well-known agricultural chemist and the first president of the Pennsylvania State College. Dr. Erwin W. Runkle, college historian, gave the principal address entitled "Evan Pugh—Teacher, Scientist, President."

THE bridge over the Arthur Kill between Elizabeth, N. J., and Howland Hook, S. I., will be named in honor of the late General George W. Goethals, under the terms of a resolution recently passed by the Port of New York Authority.

DR. SAMUEL A. MATTHEWS, professor and head of the department of physiology, therapeutics and pharmacology at Loyola University School of Medicine, Chicago, died on February 19.

DR. M. G. SCHLAPP, professor of neuropathology at the New York Postgraduate Medical School, died on March 5, at the age of fifty-eight years.

DR. ROBERT ABBE, associate in surgery at the College of Physicians and Surgeons, Columbia University, died on March 7, aged seventy-seven years.

PROFESSOR LUDWIG MILCH, director of the Institute of Mineralogy and Petrology at the University of Breslau, died on January 5, aged sixty years.

THE United States Civil Service Commission announces open competitive examinations for the positions of associate aquatic biologist, and assistant aquatic biologist, at entrance salaries of \$3,000 and \$2,400 per annum, to be held not later than March 27, 1928. Two vacancies in the position of assistant aquatic biologist, for duty at Fairport, Iowa, and Ann Arbor, Mich., and vacancies occurring throughout the United States in these positions or in positions requiring similar qualifications, will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion. The subjects to be considered are (1) education, training and experience, weight 70; (2) writings (publications or thesis, to be filed with application), weight 30. The ratings on the first subject will be based upon competitors' sworn statements in their applications and upon corroborative evidence.

THE two hundred and twentieth meeting of the Washington Academy of Sciences was held in the auditorium of the National Museum on March 15. The program consisted of a moving picture entitled "Mechanics of the Brain," prepared by Professor Ivan P. Pavlov, director of the physiological laboratories in the Russian Academy of Sciences. The picture presented a series of experiments on children and animals chosen to illustrate the mechanism of

their reactions to various external stimuli. Especial attention is paid to the development of "conditioned reflexes," which has been one of the principal subjects studied by Professor Pavlov and his collaborators. This film was exhibited through the courtesy of the American Society for Cultural Relations with Russia.

A SERIES of four addresses on the general subject "The Measurement of Mankind" is being delivered under the auspices of the Minnesota chapter of the Society of the Sigma Xi. These lectures are as follows: February 16, "The Measurement of Man in the Mass," Professor J. Arthur Harris; March 7, "Body Growth in Infancy and Childhood," Professor R. E. Seammon; March 28, "Normal and Abnormal Human Types," Professor C. M. Jackson, and April 18, "Mental Development in Relation to Physical Development and Types," Professor D. G. Paterson.

DR. JOSEPH EUGENE ROWE, professor and head of the department of mathematics and director of extension in the College of William and Mary, has been granted two sets of letters patent on the trinometer and associated instruments. The first of these consists of nine claims on the trinometer, which is an instrument that makes possible the mechanical solution of triangles and the finding of their areas by simple means. The second patent consists of improvements on the original instrument and extends it to the solution of quadrilaterals and other polygons.

THE polar ship *Morrissey*, with Captain R. A. Bartlett in command, sailed north on March 4 from Balboa, bound for the Aleutian Islands and Northern Siberia, by way of Seattle, to search for post-glacial mummies and explore little-known lands. The *Morrissey* arrived at Balboa from New York on February 29. The present expedition is headed by Dr. Frank Chapman and includes five others.

THE Field Museum of Natural History, in Chicago, has arranged an exhibition showing the results of five recent zoological expeditions. These are the Chicago *Daily News*-Field Museum Abyssinian expedition, the Marshall Field Brazilian expedition, the James Simpson Roosevelt Asiatic expedition, the John Borden-Field Museum Alaska Arctic expedition and the Conover-Everard African expedition.

AT a meeting of the directors of the Guggenheim Medal Fund at the offices of the Guggenheim Foundation for the Promotion of Aviation the following officers were elected: Elmer A. Sperry, *president*; Edward P. Warner, assistant secretary of the Navy in charge of aeronautics, *vice-president*, and Alfred D. Flinn, secretary of the United Engineering Societies, *secretary and treasurer*. The fund was established to award from time to time a gold medal to "that person who performs some notable achievement

tending to the advancement of aeronautics." The rules require that the names of the recipients must be under consideration at least a year before the award is made.

A MARINE zoological laboratory and summer camp on the Isles of Shoals will be a project of the department of zoology of the University of New Hampshire this summer, according to Professor C. Lloyd Jackson, head of the department. Full credit at the camp may be received for either graduate or undergraduate work, since, in addition to research work, full courses will be offered in ecology, systematic zoology, comparative anatomy and embryology.

THE National Park Service has announced that the Yosemite School of Field Natural History will open on June 25 for its fourth season, as a summer school for the training of naturalists, nature guides and teachers of natural history. The Yosemite Museum is headquarters for the school. The work was originated by the California Fish and Game Commission and is also participated in by the Yosemite Natural History Association. There are seven members of the staff, including A. F. Hall, chief naturalist; C. P. Russell, park naturalist, and H. C. Bryant, director of the school and nature guide.

A GIFT of \$5,000,000 has been made from the Laura Spelman Rockefeller Memorial to the Great Smoky Mountain National Park fund. The sum of \$4,913,000 has already been raised by subscription and by appropriations of the North Carolina and Tennessee legislatures. The Rockefeller gift brings the total almost to \$10,000,000, which, it is believed, is more than enough to purchase the land for the park. The park will lie partly in Tennessee and partly in North Carolina. It will be some 700 square miles in area and will take in almost all the Smoky Mountain territory.

THE State of Rio de Janeiro, Brazil, has announced the offer of a prize of approximately \$1,200 to a scientific man, either Brazilian or foreign, who prior to December 31, 1928, determines in an accurate and scientific manner the etiology of sugar cane mosaic and an effective method of combatting it, and presents the best thesis on this subject, this thesis to be published for the use of the public. Further information can be had from Dr. Enrico Teixeira Leite, director, Instituto Fomento e Economia Agricola, Ministerio da Agriculture, Rio de Janeiro, Brazil.

ACCORDING to the *Journal* of the American Medical Association a bill, authorizing the maintenance of the Gorgas Memorial Laboratory on the Isthmus of Panama and providing that \$50,000 annually be paid to the Gorgas Memorial Institute of Tropical and

Preventive Medicine, Inc., for the operation of the laboratory, has been approved by the committee on foreign affairs of the House of Representatives on condition that it be constructed within five years; that each of the Latin American governments be invited to contribute annually toward its maintenance, and that the United States be represented permanently on the board directing the administration of the laboratory, while the Latin American governments contributing have the privilege of being represented on the board.

CREATION of the "Textile Alliance Foundation" to administer a fund of approximately \$1,500,000, accumulated during the world war, for educational research in the development of the textile industry, would be provided in a bill introduced by Representative Merritt, of Stamford, Conn. The bill was referred to the house committee on interstate and foreign commerce.

THE valuable collections of fungi collected by the late Curtis G. Lloyd, who died a year ago, will probably go to the Smithsonian Institution, because the trustees in Cincinnati are unable to properly care for it. The Central Trust Company has filed suit to end its trusteeship and obtain authorization to give the Lloyd collection to the institution.

DR. WILLARD ROUSE JILLSON, state geologist of Kentucky, announces the passage through the legislature and approval by the governor of Kentucky of an emergency appropriation bill of \$34,000. This sum is immediately available for all general administrative purposes of the Kentucky Geological Survey. The annual appropriation of the Kentucky Geological Survey is \$90,000, to which sum this appropriation has been added this year.

UNDER the will of the late Dr. W. Gilman Thompson, a former president of the New York Botanical Garden, the garden is to receive the sum of \$5,000.

ANNOUNCEMENT is made that subscriptions to the Charles Sprague Sargent Fund for the endowment of the Arnold Arboretum now amount to \$793,307, or nearly three fourths of the \$1,000,000 goal.

THE United States Shellac Importers' Association has founded a research fellowship in shellac, known as the Shellac Research Bureau, at the Brooklyn Polytechnic Institute. The work is to be done under the direction of J. C. Olsen and W. F. Whitmore.

OXFORD UNIVERSITY has authorized the expenditure from the government grant of a sum not exceeding £2,800 on an addition to the department of chemistry at the University Museum so as to provide an additional workshop on the ground floor and a research laboratory on the first floor.

DR. R. M. APPERT, who recently died at San Remo at the age of sixty-five years, has bequeathed the Pasteur Institute of Paris a sum of 2,000,000 francs.

ANOTHER addition to the University of Chicago's medical center on the Midway has been made public by President Max Mason, who announced that an arrangement had been made by which the Home for Destitute Crippled Children will transfer its main hospital to the south side, where new buildings providing one hundred beds will be in operation by the summer of 1929 as one of the series of university clinics. A part of the program is made possible through a gift to the home of \$300,000 by Mrs. Elizabeth S. McElwee for the erection and equipment of one of the buildings. Another gift of \$300,000, made by Mrs. Gertrude Dunn Hicks to the university last September for an orthopedic hospital, is to be used for the erection of the other division of the building to house the home.

A SPECIAL clinic and laboratory has been opened by New York University at the new Sydenham Hospital. The clinic is designed to study exclusively cases of asthma, eczema, hives, hay fever and other allergic diseases of children from infancy up to puberty. It was made possible by the gift of \$30,000 by a friend of the university. Adequate hospital and laboratory facilities have been arranged for an intensive study of these diseases. Dr. Bret Ratner, of the New York University and Bellevue Hospital Medical College staff, who will direct the work of the clinic, began his investigations several years ago in the physiology department of the late Professor Holmes C. Jackson when an initial gift of \$15,000 for research in this field was given the university by the same donor. The experimental work involving tests on animals will continue to be done in the university laboratories. The clinic which will be open for patients immediately will be under Dr. Ratner and a special staff.

THE medical school of Stanford University has received \$500 from Mr. Edward M. Mills for free beds for children; \$1,000 from Miss Helen E. Cowell for physiotherapy treatments for indigent deserving patients; \$100 from a grateful patient to be used for surgical research; \$610.69 from the estate of Mrs. Ann Whitney Sperry to be used for the benefit of Protestant and Catholic crippled or orphaned children of San Francisco; \$2,500 from Mr. Roy N. Bishop, and \$500 from Mr. George T. Cameron as contributions to the Wellington Gregg Fund for the study of nephritis. Pediatrics, which so far has been a division of the department of internal medicine, has been made a full department in the medical school.

A RESEARCH institute for psychiatry, consisting of serological, genealogical, chemical, histological, anatomical and psychological departments, for which the

funds have been provided by the Rockefeller Foundation, will be opened at Munich next May.

*Nature* states that it has been decided to found an institute at Prague for the scientific investigation of coal. It will have the support of the state and of the various coal undertakings in Czechoslovakia.

AN anonymous donor has presented to Cornell University five hundred acres of abandoned farm land in Newfield, which will be used for experiments and instruction in forestry and as an observation ground for botanists.

AN archeological expedition sponsored by Captain Marshall Field has gone to British Honduras to seek new facts concerning the ancient culture of the Mayas and to collect material illustrating their civilization for exhibition in the Field Museum of Natural History. The expedition has for its leader J. Eric Thompson, assistant curator of Mexican and South American archeology at the museum. Its center of operations will be Belize.

WITH all construction details completed and with a large stock of rabbits on hand, the rabbit experiment station maintained by the division of fur resources of the U. S. Bureau of Biological Survey in cooperation with the National Rabbit Federation and local rabbit breeders at Fontana, California, was formally opened on March 3. The chief of the biological survey, Paul G. Redington, represented the U. S. Department of Agriculture. The station will be under the directorship of D. Monroe Green, formerly of the Washington office of the U. S. Biological Survey, who went to Fontana several months ago to take charge of the erection of the station. Assisting Mr. Green will be John W. Meyer, formerly of the office of exhibits of the Department of Agriculture.

#### UNIVERSITY AND EDUCATIONAL NOTES

DR. HARVEY NATHANIEL DAVIS, professor of mechanical engineering at Harvard University, has been chosen president of the Stevens Institute of Technology at Hoboken, N. J. Dr. Davis takes office on September 1, succeeding the late Dr. Alexander C. Humphrey.

DR. EDWARD HICKS HUME, formerly president of the Colleges of Yale-in-China, has been appointed director of the New York Post-Graduate Medical School and Hospital, and not of the Yale Graduate School as was erroneously reported in the last issue of *SCIENCE*.

DR. HARRY CLARK, of the biophysics division of the Rockefeller Institute for Medical Research, has been appointed acting professor of physics for the summer session at Leland Stanford University.

DR. JOSEPH T. WEARN has been promoted to be associate professor of medicine at Harvard University.

DR. CHARLES HUNTER has been appointed professor of medicine at the University of Manitoba, to succeed Dr. Edward W. Montgomery, now minister of public welfare of Manitoba.

PROFESSOR J. H. DIBLE, professor of pathology in the University of London and honorary pathologist to the Royal Free Hospital, has been appointed to the chair of pathology in the Welsh National School of Medicine in succession to Professor E. H. Kettle.

THE first professorship of the geology of fuel (petroleum and coal) at a German technical school has been created at Freiberg in Saxony. The occupant is to be Dr. Otto Stutzer, who has also been elected director of the new fuel institute at the School of Mines.

PROFESSOR ROBERT KÖNIG, of the University of Münster, has been appointed professor of mathematics at the University of Jena.

#### DISCUSSION AND CORRESPONDENCE THE FUNCTIONAL NATURE OF THE CONSTANT OF MASS ACTION

THE thermodynamical proof given by van't Hoff that the constant of mass action is a constant at constant temperature depends on the tacit assumption that molecules while getting transferred from one chamber to another in a certain isothermal process do not decompose. This is a difficulty in the process which has been recognized, but is usually ignored. Attempts have been made to overcome it by supposing that either, (a) the molecules are so rapidly transferred that they have not time to decompose, or (b) decomposition is prevented by a catalytic agent. But (a) does not give an isothermal process, and (b) would radically change the nature of the molecules. The writer has shown in a paper that will appear shortly in the *Philosophical Magazine*, that if all the thermodynamical conditions of equilibrium are satisfied, the constant of mass action can be shown to be a function of the volume of the interacting gas, the masses of the constituents, as well as of the temperature. It may of course be in most cases *approximately* independent of all variables except the temperature.

If this result is true, we should expect that thermodynamical differential equations exist which determine the functional nature of the constant of mass action. These the writer has obtained and will be given in a subsequent paper. They are evidence of the truth of the result obtained; additional evidence presents itself from many directions which can not be dealt with here.

From kinetic considerations we would also expect this result to hold. The number of molecules as that