Our whole conception of matter, chemistry and the science of the universe has been placed on an entirely new basis; in addition, the emanations emitted in the transmutation of the atoms of radium have been found to mutation of the atoms of radium have been found to fective means have been discovered by which certain evils from which humanity suffers, such as cancer, can be combated. The strange and profoundly new character of these discoveries, the practical developments associated with them, and the hopes that they awaken for the future, create for France the moral obligation of showing its gratitude to those who made possible this glorious event. Unfortunately, Pierre Curie passed away prematurely. With admirable faith, firm resolve and scientific self-denial, Madame Curie is continuing the work so auspiciously begun. The hour has come for France to show her grateful appreciation.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

AT the Cincinnati meeting of the American Association for the Advancement of Science, Dr. J. McKeen Cattell, president of the Psychological Corporation and editor of SCIENCE, was elected president. Vice-presidents were elected as follows: *Mathematics,* Professor John Charles Fields, University of Toronto; *Physics,* Dr. E. F. Nichols, Nela Research Laboratories, Cleveland; *Chemistry,* Dr. W. F. Hillebrand, Bureau of Standards, Washington, D. C.; *Astronomy,* Professor John A. Miller, Swarthmore College; *Geology and Geography,* Dr. W. C. Mendenhall, U. S. Geological Survey; *Zoological Sciences,* Edward Linton, professor emeritus, Washington and Jefferson College; *Botanical Sciences,* Dr. George R. Lyman, dean of the College of Agriculture of the University of West Virginia; *Anthropology,* Dr. E. A. Hooton, Peabody Museum, Cambridge; *Psychology,* Dr. R. S. Woodworth, Columbia University; *Social and Economic Sciences,* President T. S. Baker, Carnegie Institute of Technology; *Historical and Philological Sciences,* Professor L. C. Karpinski, professor of mathematics at the University of Michigan; *Engineering,* Dr. A. E. Kennelly, Harvard University and the Massachusetts Institute of Technology; *Medical Sciences,* Professor William G. Macallum, the Johns Hopkins University; *Agriculture,* Professor L. R. Jones, University of Wisconsin; *Education,* Professor L. A. Pechstein, of the University of Cincinnati.

Officers of national scientific societies affiliated with the association and meeting at Cincinnati were elected as follows:

Mathematical Association of America—*President,* Professor H. L. Rietz, University of Iowa; *Vice-presidents,* Professor J. L. Coolidge, Harvard University, and Professor Dunham Jackson, University of Minnesota.

American Physical Society—Professor C. E. Mendenhall, University of Wisconsin, was reelected president.

The American Meteorological Society—*President,* Professor W. I. Wilham, Williams College; *Vice-president,* Dr. A. E. Douglass, University of Arizona; *Treasurer,* W. R. Gregg, U. S. Weather Bureau; *Secretary,* Professor Charles F. Brooks, Clark University.

The Metric Association—*President,* Dr. George F. Kunz, New York; *First Vice-president,* Professor Arthur E. Kennelly, Harvard University; *Second Vice-president,* Theodore H. Miller, Poughkeepsie, N. Y.; *Treasurer,* Frederick T. Roberts, New York; *Secretary,* Howard Richards, New York.

The American Society of Naturalists—*President,* Professor William H. Howell, The Johns Hopkins University; *Vice-president,* Professor Lester W. Sharp, Cornell University.

American Society of Zoologists—*President,* Professor Ross G. Harrison, Yale University; *Vice-president,* Professor Robert K. Nabours, Kansas State College.

American Association of Economic Entomologists—E. R. Sasscer, entomologist of the Federal Horticultural Board, was made chairman of the Section of Horticultural Inspectors, and *Third Vice-president* of the society, W. B. Wood, of Washington, D. C., was elected *Secretary* of the Section of Horticultural Inspection.

Botanical Society of America—*President,* Dr. William Crocker, Thompson Institute for Plant Research, Yonkers, N. Y.; *Vice-president,* Dr. A. F. Blakeslee, Station for Experimental Evolution of the Carnegie Institution.

Ecological Society of America—*President,* Professor E. N. Transeau, Ohio State University; *Vice-president,* W. C. Allen, University of Chicago; *Secretary-treasurer,* Professor A. O. Weese, James Milliken University. Barrington Moore, Brooklyn Botanical Society, was appointed *Editor* of *Ecology.*

SCIENTIFIC NOTES AND NEWS

DR. L. H. BAEKELAND has been elected president of the American Chemical Society.

DR. G. STANLEY HALL, ex-president of Clark University, was elected president of the American Psychological Association at the recent meeting at Madison, Wisconsin.

THE December meeting of the Chemical Society of Washington was devoted to analytical chemistry, in honor of the seventieth birthday of Dr. W. F. Hillebrand, chief chemist of the Bureau of Standards. Drs. E. T. Allen, H. S. Washington, C. E. Monroe,

F. W. Clarke and C. E. Waters addressed the meeting on various phases of their personal associations with Dr. Hillebrand. Dr. Hillebrand in responding to the greetings reviewed briefly some of his early personal experiences.

DR. JOHN G. FITZGERALD, professor of hygiene and preventive medicine and director of the Connaught Antitoxin Laboratories of the University of Toronto, has been elected to membership in the International Health Board of the Rockefeller Foundation.

DR. GIOACCHINO FAILLA, physicist at the Memorial Hospital, New York City, has received the degree of Doctor of Physical Science from the University of Paris for his studies of radium.

PROFESSOR A. FOWLER, professor of astrophysics, Imperial College of Science and Technology, and Mr. G. I. Taylor, fellow and lecturer in mathematics, Trinity College, Cambridge, have been appointed Yarrow research professors of the Royal Society, under the gift of £100,000 made by Sir Alfred Yarrow.

THE gold medal of the Royal Scottish Geographical Society has been awarded to Dr. Hugh Robert Mill, and the Livingstone gold medal to Dr. Marion I. Newbiggin, in recognition of their distinguished service in geographical research and exploration.

M. LE DUC DE BROGLIE, Dr. C. L. Guillaume and Professors Debye, Einstein, Groth and von Laue have been elected honorary members of the Royal Institution, London.

E. G. D. MURRAY, research bacteriologist to the Medical Research Council and formerly on the staff of the War Office Central Cerebro-spinal Fever Laboratory, has been elected to a fellowship at Christ's College, Cambridge.

PROFESSOR R. KRAUS, director of the Serum Institute at Sao Paulo, has resigned his appointment and returned to Vienna.

DR. JOSEPH T. SINGEWALD, JR., professor of economic geology at the Johns Hopkins University, and Mr. Lincoln Ellsworth, of New York, will sail for Peru in February to make a geologic cross-section of the Andes of Central Peru. The expedition will be known as the Ellsworth Expedition and the geologic materials collected will be worked up by the department of geology of the Johns Hopkins University.

DR. H. L. SHANTZ, physiologist in charge of the plant physiology and fermentation investigations of the U. S. Department of Agriculture, will sail from Marseilles on January 17 as a member of the Educational Commission to East Africa of the Phelps-Stokes Fund. The expedition plans to spend eight months in an investigation of the hygienic, economic and educational conditions of the country.

PROFESSOR A. L. KROEBER, head of the department of anthropology of the University of California, will leave in January for Mexico to lead an archeological expedition being sent out by the Mexican government.

DR. OLIVER C. FARRINGTON, curator of geology in the Field Museum of Chicago, returned this week to the United States from a seven months' exploring expedition into the interior of Brazil.

DR. M. P. RAVENEL, professor of preventive medicine and director of the public health laboratory at the University of Missouri, lectured before the Society of Sigma Xi at the University of Kansas on December 13, on the "Prolongation of Life." This lecturer initiated an annual exchange of lecturers between the Sigma Xi chapters at the two universities.

DR. MADISON BENTLEY, professor of psychology at the University of Illinois, will deliver the annual circuit lecture in February before the Chapters of Sigma Xi at the Universities of Missouri and Kansas.

AT a recent meeting of the Washington Chapter of the Society of Sigma Xi, ten-minute talks on "The most interesting thing I have seen the past summer" were made by various members, including L. O. Howard, on the Wellcome Medical Historical Museum in London; Paul Bartsch on under-water "movies" in the Bahamas; H. L. Shantz, on botanical excursions in Switzerland; E. E. Slosson (president of the local chapter), on electrification in Sweden; W. T. Lee, on the newly explored enormous caves in New Mexico; E. D. Ball, on petrified forests in the Bad Lands.

CONRAD N. LAUER delivered the fifth Cyrus Fogg Brackett Lecture at Princeton University on December 12. The subject of the lecture was "Engineering in American Industry." Mr. Lauer traced the great increase in production, product value and other data of American industry during the last hundred years.

PROFESSOR FRIEDRICH FULLEBORN, of the School of Tropical Medicine, Hamburg, Germany, delivered a lecture on "Filariasis" as one of the de Lamar lectures in hygiene, at the School of Hygiene and Public Health, Johns Hopkins University, on November 26.

THREE free public lectures on "Some chapters in the recent development of the theory of electrolytic dissociation" were given by Professor J. N. Brönsted, of the University of Copenhagen, at University College, London, on December 10, 12 and 14.

IN memory of Dr. William S. Halsted, surgeon-in-chief of the Johns Hopkins Hospital, the Johns Hopkins University and hospital held a public meeting

on December 16, at which addresses were made by Dr. Rudolph Matas, New Orleans; Dr. John M. T. Finney and Dr. William H. Welch, both of the Johns Hopkins University.

DR. SAM'L P. SADTLER, from 1874 to 1891 professor of organic and industrial chemistry at the University of Pennsylvania, has died at the age of seventy-six years.

DR. JAMES HARKNESS, Redpath professor of mathematics at McGill University and acting dean of the faculty of arts, died suddenly last week, at the age of fifty-nine years.

SIR FREDERICK TREVES, formerly Hunterian professor of anatomy and Wilson professor of pathology at the Royal College of Surgeons, died on December 7, aged seventy years.

JOHN EDWARD STEAD, F.R.S., a distinguished English metallurgist, died on October 31 at the age of seventy-two years.

THOMAS PRIDGIN TEALE, F.R.S., the eminent English surgeon and sanitarian, died on November 13, aged ninety-two years.

MAURICE LEBLANC, a leading French electrical engineer, died on October 27.

PROFESSOR DR. ED. VERSCHAFFELT, director of the Botanical Gardens, since the retirement of Hugo de Vries, and professor of plant physiology and pharmacognosy at the University of Amsterdam, died on June 26 in the fifty-fifth year of his age.

THE death is reported of Professor L. Milch, the distinguished petrographer of the University of Giessen.

DR. FUSAKICHI OMORI, professor of seismology at the University of Tokyo, president of the Imperial Earthquake Investigation Committee, died at Tokyo on November 8.

PROFESSOR C. C. O. R. TIGERSTEDT, professor of physiology in the University of Helsingfors, Finland, author of works on the physiology of the blood circulation, died on December 2, aged seventy years.

A MURAL tablet in memory of the late Professor James W. H. Trail, F.R.S., Regius professor of botany in the University of Aberdeen from 1877 until his death in 1919, has been placed in the classroom of the new department of botany, and was unveiled and presented to the university, on behalf of the subscribers, by Sir David Prain, on December 7. The tablet is mounted on a slab of slate. A portrait plaque in dull green bronze is surrounded by a wreath of oak leaves, acorns and galls. It is flanked by two Brazilian palms, and a decorative panel shows other natural objects representing the varied interests of Professor Trail. The tablet is the work of Miss Alice B. Woodward. The subscribers have also issued a memorial volume which, besides biographical and bibliographical matter, includes the "Flora of the City Parish of Aberdeen," a comparative and historical work of great detail which had occupied Professor Trail for many years, and had been completed shortly before his death.

AS was announced last June, the friends, fellow workers, and pupils of the late Professor Augustus D. Waller, F.R.S., and Mrs. Waller, have resolved to establish a memorial in recognition of their lifelong devotion to physiological investigation. The memorial is to take the form of a fund, to be used for the encouragement of scientific research. The fund will be administered by the council of the London School of Medicine for Women, where Professor Waller was a lecturer in physiology, where Mrs. Waller was first a student, then demonstrator, and later a member of the council until her death, and where their daughter is lecturer in physics. Dr. Waller was lecturer in physiology at St. Mary's Hospital Medical School for nineteen years, and it has now been suggested that an additional memorial should be established in the form of a research room to be called the Waller Research Laboratory in connection with the physiological department.

Nature writes: "At the request of the local committee arranging the meeting of the British Association at Toronto next year, the Council of the association has changed the date of the meeting from September to August 6–13. The main party will leave England about July 25, and the excursion tour will be after the meeting instead of before it. The new arrangements will, we believe, be preferred to the old by most of the members who propose to attend the meeting, which is likely to be large and successful, as many members of the American Association also intend to take part in it. The British Association will meet in Southampton in 1925, and has received an invitation from the University and city of Oxford to meet there in 1926."

ANNOUNCEMENT is made by the Carnegie Institution of Washington that the Marine Biological Laboratory at Tortugas, Florida, will be open for use by a limited number of investigators in the summer season of 1924. It is expected that Mr. John W. Mills, engineer of the laboratory, will leave Key West with the *Anton Dohrn* for the initial trip to Tortugas about June 15. Further information concerning the proposed work may be obtained by addressing communications directly to the Carnegie Institution of Washington, Washington, D. C.

THE first building of the Army Medical School, located at the Walter Reed General Hospital, in Washington, is completed and is nearly ready for occupancy. The cost of the unit was $450,000. It contains laboratories for the various sections, operating rooms and a roentgen-ray unit. All typhoid vaccine for the army and U. S. Public Health Service will be made in one of the laboratories.

J. HARRISON BELKNAP, formerly assistant professor of electrical engineering at the Oregon State Agricultural College, has joined the control engineering division of the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

UNIVERSITY AND EDUCATIONAL NOTES

AT the December meeting of the Rockefeller Foundation a total sum of $2,725,000 was appropriated in fulfillment of various pledges given previously by the foundation. In addition it was voted to continue certain fellowships in United States educational institutions. Of these appropriations, $1,000,000 will go to the medical school of the University of Chicago, $1,000,000 to the medical school of the University of Toronto, and $225,000 to the medical school of the University of Iowa. The remaining $500,000 is for the endowment of the medical school of the University of Alberta. The fellowships to be continued are in physics, chemistry, medicine and the biological sciences under the auspices of the National Research Council.

ST. STEPHEN'S COLLEGE, at Annandale on Hudson, N. Y., has received $125,000 from the estate of the late John R. Hegeman, of New York.

DR. JAMES ARTHUR HARRIS, of the Cold Spring Harbor Biological Laboratory, with which he has been associated since 1907, has been elected professor of botany and head of the department of botany of the University of Minnesota. He will take up his new work in September, 1924.

DR. JAMES H. MEANS, formerly assistant professor of medicine, has been appointed Jackson professor of clinical medicine, in the Harvard Medical School, to succeed Dr. David L. Edsall, the dean of the Medical School. Dr. Means is chief of the medical service at the Massachusetts General Hospital, Boston, in which capacity also he succeeds Dr. Edsall.

R. T. HASLAM has been promoted to a full professorship in the School of Chemical Engineering Practice, Massachusetts Institute of Technology.

PROFESSOR O. W. ALBERT, of Grinnell College, has been appointed head of the department of mathematics at the University of Redlands.

DISCUSSION AND CORRESPONDENCE

A SUGGESTION AS TO THE APPROXIMATE CHARACTER OF THE PRINCIPLE OF RELATIVITY

THE special principle of Relativity may be formulated partially somewhat as follows: In all systems moving with uniform velocity with respect to the fixed stars (called inertial systems by definition) the "laws of nature" take an especially simple form, and are the same for all the inertial systems.

Something equivalent to this seems to be an essential part of any rigorous formulation of the special principle. Now such a formulation demands an examination of what we mean by "laws of nature." Obviously we can not include among our laws of nature a statement that the stellar system has a certain apparent velocity, for this velocity is different for different inertial systems. We evidently mean that the laws of nature are the laws governing the happenings which take place solely in any one of the inertial systems, supposed isolated from the rest of the universe.

These considerations allow us incidentally to make an alternative formulation of the principle of relativity as follows: "It is actually impossible to detect uniform motion with respect to the fixed stars except by looking at them."

The necessity of supposing our inertial system isolated from the rest of the universe must arouse considerable misgiving, for it is not at all certain that it is physically possible to isolate a part of the universe from the rest. On the contrary, in such experiments as the gyroscopic compass and Foucault's pendulum, we have important evidence that happenings in our own system are essentially connected with all the rest of the universe, for the only significance which can be attached to an invariable direction, which these experiments show to exist, is a direction invariable with respect to the stellar universe. (Perhaps one reason that this connection is not more often prominent in our minds is that we are still very far indeed from being able to give that mechanistic account of the connection that our minds so insistently demand.) Admitting then the fact of such a connection, we find the ignoring of it by the principle of relativity logically difficult to justify. But we may physically justify the neglect of it if we can see any reason to expect that the effect of a translation may be very much smaller than that of a rotation. Such a difference is at once found in the enormous difference of actual velocities of translation and rotation when measured in cosmic units. In dealing with phenomena of connection with the entire universe, we naturally expect to employ coordinates relative to the entire universe. Now the earth in rotating about its axis runs through the entire possible range of co-