bear them to the sea, is the place from which such gravity is removed; it will make itself lighter and in consequence will make itself more remote from the center of gravity of the earth, that is from the center of gravity of the universe which is always concentric with the center of gravity of the earth. . . . The summits of the mountains in course of time rise continually.[2]

JOHN P. DELANEY

LOYOLA COLLEGE

JOSEPH LOUIS LAGRANGE

I AM preparing a study on the great mathematician, Joseph Louis Lagrange (1736–1813), and would welcome any information concerning MSS (letters from him or to him) in public or private libraries. I would gladly pay for photostatic copies of such MSS and the owner's courtesy would be fully acknowledged.

GEORGE SARTON

QUOTATIONS

INTERNATIONAL COOPERATION IN SCIENCE

ONE occasionally hears the statement that the trend of intellectual leadership is westward across the Atlantic. In proof of the assertion specific fields are mentioned, such as neuro-surgery, astronomy, dentistry and perhaps orthopedics, in which America has won pre-eminent standing. But this argument overlooks the many fields in which leadership, certainly until the war began, was still in Europe and the many others in which genius and stimulation are as potent on one side of the ocean as on the other. In physiology, for example, it would be difficult to determine whether the leadership lies in Europe or in the United States. The same is true of anatomy and pathology. In fields like pharmacology, tropical medicine, ophthalmology, legal medicine, social medicine and dermatology—to mention only a few—leadership is unquestionably still in Europe, or was in 1939. In mathematics, the English are indisputably pre-eminent in analytic number theory; the Russians are making important contributions in topology and probability, the French in algebra. America can not match the group of European scientists in the important fields of enzyme chemistry and the organic chemistry of natural products. Nowhere else in the world can one duplicate or even approach the coordinated and cooperating Scandinavian group which is focusing so many precise techniques of chemistry and physics on problems of biology.

If one is tempted to question the vitality of science in Europe, it is interesting to note that the most dramatic scientific development of the year 1939 originated there, *i.e.*, the splitting of the atom of the heavy element uranium and its transmutation into barium and other light elements. This realization of the old dream of the alchemists was based upon results obtained in 1934 by the Italian physicist Fermi; but the disintegration products of uranium were first directly observed in 1939, by Hahn and Strassmann of Berlin.

[2] The Notebooks of Leonardo da Vinci, Edw. MacCurdy, Vol. 1, p. 344.

America needs to be humble about this question of intellectual leadership. In spite of the anxiety and insecurity abroad during these recent years, of the six Nobel prizes awarded in science in 1939, five went to Europe and one to the United States. In countless ways we are dependent upon Europe for stimulation and leadership in relation to many segments of our intellectual and cultural activity.

If because of war-exhaustion or chaos the universities and laboratories of Europe should be forced to suspend their fundamental activities for even half a decade, the consequences to the intellectual life of America would be immediate and disastrous. For scientific growth is almost invariably the result of cross-fertilization between laboratories and groups in widely separated parts of the world. Only rarely does one man or one group of men recite with clear, loud tones a whole important chapter, or even a whole important paragraph, in the epic of science. Much more often the start comes from some isolated and perhaps timid voice, making an inspired suggestion, raising a stimulating question. This first whisper echoes about the world of science, the reverberation from each laboratory purifying and strengthening the message, until presently the voice of science is decisive and authoritative. Thus, in the case of the breakdown of uranium during the past year, the early tentative questionings came from Rome; they were caught up at Berlin, were eagerly heard at Paris and Copenhagen and then spanned the Atlantic and were seized upon here so enthusiastically that literally within hours, rather than within days, the critical experiments had been checked and extended at Columbia University, at the Carnegie Institution of Washington and in Lawrence's laboratory at the University of California.

Similarly, the amazing development and application of sulfanilamide—that beneficent gift to mankind—has been the result of a collaboration in which flags and boundary lines have been non-existent. The first hint of it was discovered in Germany, oddly enough in connection with the commercial dye industry, and the drug was given the name prontosil. With this

hint as a basis, in 1935 a German scientist—Dr. Gerhard Domagk—published the results of his experiments with mice under carefully controlled laboratory conditions, showing the extraordinary effect of prontosil on streptococcus. The Pasteur Institute in Paris then picked the matter up, and subjecting prontosil to organic analysis discovered that its activity was localized in one distinctive part of its molecular structure. This potent factor in prontosil, separated from the rest of the molecule, is what we now know as sulfanilamide. At this point Queen Charlotte's Hospital in London, with a grant from The Rockefeller Foundation, tried the drug on women suffering from streptococcal infection associated with puerperal or childbirth fever, immediately reducing the death rate from such infections by 25 per cent. The Johns Hopkins School of Medicine was the next institution to carry forward the experiments, and in the last three years research on this drug has been developed, with brilliant results, in laboratories and hospitals on both sides of the Atlantic.

Achievement in science, more often than not, is the result of the sustained thinking of many minds in many countries driving toward a common goal. The creative spirit of man can not successfully be localized or nationalized. Ideas are starved when they are fenced in behind frontiers. The fundamental unity of modern civilization is the unity of its intellectual life, and that life can not without disaster be broken up into separate parts. If, as a result of the present cataclysm on the other side of the Atlantic, Europe freezes into an Arctic night, we shall not easily keep the fires lit in the universities and laboratories of America.—*Raymond B. Fosdick in the Review of the Rockefeller Foundation for 1939.*

SOCIETIES AND MEETINGS

THE KANSAS ACADEMY OF SCIENCE

THE seventy-second annual meeting of the Kansas Academy of Science was held from March 28 to 30 at the University of Wichita, Wichita, Kansas, with Dr. H. H. Hall, professor of biology, Kansas State Teachers College, Pittsburg, as president. Affiliated with the academy and meeting as a section, the Kansas Entomological Society held its sixteenth annual meeting, but the Weather-Crops Seminar held its meeting at Wichita last fall. The Kansas and Southern Nebraska chapter of the American Association of University Professors, the Kansas Section of the Mathematical Association of America and the Kansas Association of Teachers of Mathematics met in cooperation with the academy. The meetings are summarized in Table I.

The Junior Academy of Science, under the direction of an academy committee consisting of J. A. Brownlee, Edith Beach and J. R. Wells, had a program consisting of demonstrations from 13 Junior Academy groups out of the 28 clubs enrolled.

Special features for the general meetings were the lecture on Thursday evening on March 28, on "Meteorites" by Dr. H. H. Nininger, curator of meteorites, Colorado Museum of Natural History, Denver; the public lecture on Friday evening by Dr. E. C. Auchter, chief of the Bureau of Plant Industry, Washington, D. C., on the subject, "Plant Research and Human Welfare," and the banquet with Dean E. O. Deere, Bethany College, as toastmaster, who introduced the life and honorary members present and read letters of greeting from absent ones. President W. M. Jardine, of the University of Wichita, gave a short but forceful address of welcome in which "more research" and "more light" were said to be needed to solve the stubborn problems of the nation.

The academy decided to begin the publication of a series of handbooks of pocket size. The handbook committee has recommended "Winter Twigs," by Dr. F. C. Gates, professor of botany, Kansas State College of Agriculture and Applied Science, Manhattan, and editor of the "Transactions" of the academy, as the first of the series.

The committee on conservation and ecology recommended, followed by academy approval, that an un-

TABLE I

Section or group	Presiding chairmen	Number of papers on program	Persons attending meeting	Chairmen for 1940–1941
Biology Teachers	John Breukelman	7	60	A. N. Gentry
Botany	M. W. Mayberry	26	62	F. W. Albertson
Chemistry	Harold P. Brown	10	90	K. S. Bergstresser
Physics	A. B. Cardwell	16	48	S. Winston Cram
Psychology	W. H. Mikesell	15	55	Geo. Kelly
Zoology	A. B. Leonard	34	80	Robert Bugbee
Geology	A. C. Carpenter	20	45	Carl Barnhart
Phy. Science Teachers	Lawrence Oncley	6	25	Lawrence Oncley
Entomology	R. T. Cotton	28	45	R. L. Parker
Junior Acad. Com.	J. A. Brownlee	13	400	J. R. Wells
Weather-Crops Sem.	...	...	...	W. A. Cochel
Amer. Asn. Univ. Professors	Robert Conover	6	40	Robert Conover
Mathematical Asn. of America	Cecil B. Read	9	44	C. B. Price
Kans. Asn. of Teachers of Math.	Gilbert Ulmer	9	65	Mrs. Adelle Davis