circulars including monographs on white pine, the southern timber pines; results of tests and studies in timber physics, the first complete discussion of the metal railway tie as a possible substitute; studies on timber impregnation and other subjects all of immediate value in wood utilization are evidences to-day of the painstaking work of the guiding spirit which directed them and edited their results for publication.

Throughout the twelve years in the Department of Agriculture Dr. Fernow never ceased to write articles and addresses. In these years the larger part of two hundred articles and addresses, over twenty circulars, and over thirty bulletins and reports were prepared and edited.

In 1898 Dr. Fernow was called to Cornell to organize the first forestry school in the new world. Here he inaugurated the beginnings of professional education. The school grew rapidly, but the forest operations in the college forest in the Adirondacks met with opposition of wealthy camp owners. In 1903 the Governor vetoed the appropriations of the forestry school and this resulted in its discontinuance. After leaving Cornell he worked for four years as consulting forester. During these four years he continued the *Forestry Quarterly;* delivered lectures at Yale University, and started the forest school at Pennsylvania State College. In 1907 Dr. Fernow accepted an invitation to Toronto University and organized the first forest school in the Dominion. At the time of his death he was professor emeritus of that institution.

His well-known "History of Forestry" is a masterpiece of its kind, covering the subject for both the Old and New World.

Three years ago when Dr. Fernow retired from active teaching there was published in *American Forestry* a tribute by Raphael Zon to the father of forestry in the new world. To-day the words assume an added significance. "While the period which Dr. Fernow typifies is rapidly becoming history, his teachings and his contributions have the equality of permanence. They have been always a source of inspiration and guidance to the pioneers of forestry; they will be infinitely more so to the actual managers of our forest lands as soon as real woods forestry comes into general practice. As with any great teacher, it is not the kind of theory that he happens to advocate that really counts, but the ability to teach how to think in his particular field. Theories come and go, but the ability to orient oneself in the details of complex problems is a lasting asset; he who teaches to meet ever-changing problems, not by a ready-made theory or hypothesis, but by a critical attitude and ability to discern between the essential and non-essential, is building on a solid foundation. With him forestry was not merely theory but a movement ever changing as life itself, and for him problems became soluble not in ready-made formulas, but in the forces, economic and natural, that are at work." X.

## GEORGE LEFEVRE

GEORGE LEFEVRE, professor of zoology in the University of Missouri and chairman of the department, died on January 24, after a brief illness with pneumonia. The foregoing announcement marks the passing of one who was probably the best loved man in the American Society of Zoologists, a man whose brilliant intellectual endowment and gifted nature marked him as a unique personality. Born of old American stock and inheriting his name from a Huguenot ancestor who immigrated at an early date, he was the son of a prominent Presbyterian clergyman who raised his children on good English, the Classics and the Shorter Catechism, and who read his original Greek and Hebrew almost to the day of his death.

After Professor Lefevre's graduation from a famous boys' school in Baltimore, the family spent a year in European travel; and although he was too young to profit scientifically by the experience, this European sojourn became an invaluable part of his cultural education. During his earlier boyhood the family spent long vacations in the country near Baltimore, where he acquired an interest in natural history and became an ardent amateur naturalist. It is, therefore, not surprising that he should have been attracted to zoology after his entrance to the Johns Hopkins University. Here he received a fundamental scientific training under the influence of Remsen, Rowland, Martin,

Brooks and others of that generation. Throughout his life he remembered with pride that as an undergraduate he studied under such influences. His graduate work in zoology was pursued in the same institution and after an unusually thorough training extending from 1891 to 1896 he received the doctor's degree. After a further apprenticeship as an assistant at the Hopkins, he taught in Atlanta, Georgia, in the year 1898-99; and in the fall of 1899, was appointed professor of zoology in the University of Missouri, which position he held until his death. At the Hopkins he was commonly regarded as one of the most brilliant men who had ever been enrolled in zoology. His ten years as undergraduate and graduate he sometimes regretted because of the continuity of associations. But they gave him a foundation that few men obtain and one that was in evidence throughout his life.

From the beginning he occupied a prominent place upon the faculty of the University of Missouri. Probably no man not in one of the major administrative positions exercised greater influence, and personally there was none who equalled him. He was always loaded with a burden of committee work of the most diverse sort from which he was never released, because his idealism, good judgment, courtesy, and unquenchable humor rendered his services indispensable. In his own department his personality was unfailing and the tradition of its *esprit de corps* is known throughout the country. The present biological building with its admirable arrangement and equipment is his creation more than that of any other man, for he enjoyed the confidence alike of architect and university administration and his leadership in the team-work of his department yielded a remarkable return for the investment. But more than this his name is written in the hearts of students and colleagues through his ideals as a scholar and a man and through the charm of his personality. Among his associates on the faculty he was universally recognized as a man of the finest intellectual quality. His keenness of wit, his gift in conversation, and his social graciousness made him a marked man, whose friendship was prized and who was admired by all who understood the spirit within him.

The Lefevre laugh will be remembered by every one who knew him; also his stories, for he possessed a gift of mimicry along with his sense of humor. One of his friends who knew him best once dedicated the following lines to his brave spirit of laughter that often masked an unsuspected burden:

TO THE MAN WHO LAUGHS

A health to my friend
With spirit blythe!
  From Cavaliers of old
Who laughed at fate,
Perchance came down
  That spirit which makes him bold.

Let Roundheads sigh
Sit sourly by
  And scorn the fleeting show
But men like you
They dare and do
  And jest 'neath stinging blow.

Who hath seen his dead,
But with spirit uncrushed
  Hath faced his life anew
With a smile on lip,
Though the heart went white,
  And won to happiness new.

Who when death comes,
Though others quail
  And silent its bitterness quaff,
Shall laugh at death—
So all may know
  What glory it is to laugh.

In the matter of publications, what he did was done with the finish of a master workman, and those of us who were associated with him know that his scientific mind was eternally active. Studies upon the morphology and embryology of the Tunicata constituted the work of his student days. A paper upon "Artificial parthenogenesis in Thalassema" (1907) is representative of his interests from 1902 to 1906. An extended investigation of the "Artificial propagation of fresh-water mussels," in collaboration with the writer of this article, occupied some half dozen years before it was finally published in 1912; while lesser papers in cytology by himself and his students marked his dearest interest. Cytology and genetics absorbed his attention in recent years. Under the auspices of the agricultural experiment station at the University of Missouri he carried

out an investigation of the inheritance of certain coat colors in poultry, the last paper of which was on his desk completed and ready for mailing at the time of his death.

In recent years his physical well-being was seriously impaired, and no doubt his untimely end was the indirect result of a long-standing disability. When a graduate student he underwent a serious operation supposedly for appendicitis. What was actually done was to drain an abscess and save his life. The abnormal conditions thus produced followed him throughout the remainder of his life. This circumstance, and the tragic death of his first wife in 1900, the year following their marriage, laid upon him a burden that many men could not have endured. But he was outwardly cheerful and uncomplaining. In 1914 increasing difficulties rendered an exploratory operation imperative. Gall stones and his supposedly absent appendix were then removed. A year for recovery and a few years of comparative comfort, then further intestinal disorders, more comfort when he was assured in 1921 that it was nothing more serious than adhesions of the old wounds, but an obvious frailness of body that alarmed his friends, until in recent months he seemed fit to succumb to any serious disturbance, although there was no flagging of spirit.

On Monday, January 15, he presided at a departmental meeting in his inimitable fashion, on Wednesday he conducted his seminary and seemed at his best, a week in bed and he died on the evening of the Wednesday following, at the time for the customary assemblage of students at his home. Would that it could be given to all of us to go out of life like that, having fought so good a fight and having preserved such spirit to the end.

Professor Lefevre leaves a wife, having married Julia Faris in 1914. A son, who bears his name, already shows many of the traits that so endeared the father to his associates. The loss is irreparable. But the present George Lefevre will never lack devoted friends. His father was a scholar—and more than that, he was, to those of us who loved him best, the finest gentleman we ever knew.

W. C. CURTIS

UNIVERSITY OF MISSOURI,
FEBRUARY 1, 1923

# SCIENTIFIC EVENTS

## THE NEW ELEMENT HAFNIUM

DRS. COSTER and G. HEVESEY write from the laboratory of theoretical physics of the University of Copenhagen to *Nature* on January 21 as follows:

In a former letter to *Nature* (January 20) we announced the discovery of a new element with atomic number 72, for which the name hafnium was proposed. Evidence was given that this element is a homologue of zirconium in accordance with theoretical expectations (Bohr, "Theory of Spectra and Atomic Constitution," p. 114, Camb. Univ. Press, 1922). Continued experiments enable us to complete the statements in the former letter. By the addition of a known quantity of tantalum (73) to our samples, and by a comparison of the intensity of the Ta-lines with the Hf-lines, a closer estimate of the amount of hafnium present has been obtained. We have investigated a great number of zirconium minerals from different parts of the world. They all contained between five and ten per cent. of hafnium. In samples of commercial zirconium oxide investigated, we have found the new element, amounting in one case to as much as five per cent. Starting from the latter substance, by means of a chemical method which is also adapted to separate zirconium from the other tetravalent elements, we have been able to obtain several grams of a preparation in which the presence of about fifty per cent. of hafnium could be established. Conversely, we have succeeded in preparing zirconium in which no hafnium lines could be observed. Further particulars about the method of preparation and provisional determination of the atomic weight will be published shortly in the communications of the Copenhagen Academy.

In an editorial note *Nature* says:

Since the publication of the letter "On the Missing Element of Atomic Number 72," by Dr. Coster and Professor Hevesey, in *Nature* of January 20, p. 79, it has been announced that Dr. Alexander Scott detected and separated the oxide several years ago. It appears that while examining in 1913 a specimen of titaniferous iron sand (75 per cent. $Fe_3O_4$, 25 per cent. $TiO_2$) from near Maketu in the North Island, New Zealand, Dr. Scott noticed that in the titanium dioxide separated in the ordinary methods of analysis there was always a small residue which resisted all attempts to get it into solution, either as sulfate, chloride or nitrate. Neither would it go into solution after prolonged fusion with caustic soda. No trace of the many "rare earths" was found