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

in the sand. The insoluble residue remaining after repeated and alternated fusions with sodium bisulfate and caustic soda was labeled "New Oxide" in 1918. Its properties and mode of occurrence indicated that it was an oxide of the titanium-zirconium group, and that it was the oxide of the missing element, of which the atomic number is 72. Some of its properties showed a resemblance to tantalum, its next neighbor, with the atomic number 73; but all traces of this element would be removed by the repeated fusions with caustic soda. As none of the ordinary salts were available for the purpose of determining the atomic weight, recourse was had to the double fluoride with potassium, which closely resembles those of titanium and zirconium. The rough determinations with material imperfectly purified for such a purpose indicated that the atomic weight of the element was between one and one half and two times that of zirconium (90.6). The oxide resulting from these determinations was of a cinnamon-brown color, not white as was expected. We understand that Dr. Scott wrote on January 28 to Drs. Coster and Hevesey offering to send them specimens of his separated material to compare with their own, and received a reply from them on Saturday night last (February 3) saying they would be very glad to do so. On Monday Dr. Scott sent to them practically all his purified material, and not only he, but also all scientific men, must await with keen interest the result of the searching examination by means of the powerful appliances in their hands for spectral analysis by X-rays. In view of the source of his oxide and its association with much titanium oxide, Dr. Scott has suggested, as Oceanus was one of the Titans, that "Oceanium" would be a suitable name for the element. This name would also recall that the sand came from Oceania, of which New Zealand is one of the component parts.

GEODETIC AND TIDAL SURVEYS

A CONFERENCE was held in Ottawa on January 2, 3 and 4, at which officers of the United States service discussed with Canadian officials problems common to the two countries. The visitors were Dr. William Bowie, chief of the Division of Geodesy of the United States Coast and Geodetic Survey, who conferred on geodetic work with Dr. E. Deville, director general of surveys, and Mr. Noel Ogilvie, director of the Geodetic Survey of Canada, and Mr. G. T. Rude, chief of the Division of Tides and Currents, who met Dr. Bell Dawson, superintendent of the Tides and Current Surveys of Canada, and discussed tidal data.

The cooperative geodetic plan includes primary or precise triangulation along the international boundary from Lake Superior to the Pacific coast, and extension of triangulation in Idaho, Oregon and Washington to the Canadian boundary. On the Pacific coast similar cooperative work is being carried on from northern Washington through British Columbia to the Yukon territory and Alaska. The plan also includes several lines of precise leveling for strengthening the precise level nets of both countries.

The triangulation and precise leveling will be available to both countries for all classes of work needing precise control. The result will be coordination in the surveys of the two countries, and the geographical positions of boundary monuments will be the same on the maps of each. Accurate maps are possible only after the precise establishment of geodetic control points, and on accurate maps the development and prosperity of any country largely depend. Accurate maps have also an important influence in promoting cordial international relations.

Referring in one of his public addresses in Ottawa to cooperative geodetic work, Dr. Bowie stated that, as far as triangulation and precise leveling were concerned, there was one geographical unit for Canada, the United States and Mexico. He added that North America was the only continent that could boast of this uniformity, and that Europe for years had been struggling, so far unsuccessfully, to obtain the same result. Geodetic cooperation between Canada and the United States was most conspicuous and most happy.

Mr. Rude spoke of the importance of accurate charts and of a thorough investigation of facts relating to tides and currents. He referred also to the cooperation that existed between Great Britain, Canada and the United States in regard to the interchange of such knowledge.

COLLOID CHEMISTRY

WITH the assistance of prominent specialists the world over, I am preparing a comprehensive book on Colloid Chemistry, Theoretical