

## **MUND Walter**

Born: January 22, 1892 (Antwerp)

Died: August 15, 1956 (Heverlee)

Walter is the youngest son of the seven children of Max Mund and Marie-Thérèse Windthorst. They call him *Abendskind*. The cousin of his mother is Ludwig Windthorst (1812-1891), founder of the Catholic German Centrum party and opponent to the protestant oriented *Kulturkampf* politics of chancellor Otto von Bismarck (1815-1898). Walters grandfather Edmond was a German doctor in Duisburg. Two sons settle in Antwerp: Adolf (1841-1904) as a ship chandler and Max (1846-1919), Walters father. The elder brother Rodolf has his office of ship chandler in London.

### **A Bright student**

After his secondary studies at the Jesuit college in Antwerp (a fellow pupil will become a governor of the Belgian Congo: Pierre Ryckmans – 1886-1950), he establishes a personal laboratory in a garden shed and is fascinated by scientific experiments. As a student at the faculty of sciences at the University of Leuven (1910), he prepares his doctorate under the mentorship of the (only) seven year older professor Pierre Bruylants (1886-1950) on a subject of physical chemistry viz. the vapor pressure of SO<sub>2</sub> at low temperatures. He graduates summa cum laude as a Ph.D. on July 24, 1914.

When the First World War breaks out he flees to Manchester with his brother and obtains a job as chemist in the food industry. He volunteers for the Belgian army in 1915 but is turned down as a frontline soldier on the Ijzer because of his German descent. He is kept away from the frontline in a number of encampments (a.o. at Vernon) and works in a factory of synthetic dyes. For this reason he will turn down in 1935 his knighthood in the Belgian Order of Leopold. Nevertheless, Walter joins up with the frontline troops as a corporal to prepare for a last and almost suicidal crossing of the Scheldt on November 10, 1918. Fortunately the next day the Armistice comes in force. Mund will often declare that “churches should sing the Requiem rather than the Te Deum”! The aftermath of the war is disenchanting: his father has died, the other members of the family have returned to Germany and the family properties are confiscated. However, professor of industrial chemistry Gustave Delmacel (1886-1923) welcomes him as his assistant in Leuven. At the same time he tries to establish a factory of dyes.

In 1919 he specializes in a new field: the study of the chemical effects of radioactivity, which he calls “radiochemistry”. He even applies to the “Institut du Radium” in Paris, where Madame Curie (1867-1934) provides him with a sample of radium.

Walter is also interested in photochemistry and azeotropy.

### **An Eccentric Professor**

In 1919 Mund is appointed professor of physical chemistry at the Université Catholique de Louvain and in 1925 also starts his lectures on physics. He never prepares his lessons, never refers to a textbook or notes, starts from a practical problem or an experiment and elaborates his chosen subject with reference to related disciplines: mechanics, hydrodynamics, optics, thermodynamics, electromagnetism, relativity, probability, etc.

He has a prodigious memory. He thinks up his weekly exercises in physical chemistry on the last moment. This is a spur for the students to think hard and enthusiastically come up with their solution. This pragmatic approach reveals itself when Mund has to design a new apparatus. He prefers wood to copper, copper to steel and old-fashioned glass to Pyrex!

### **A Relevant Clash of Ideas**

In the early days of the research on the phenomenon of radioactivity, the question is whether to consider radioactive radiation as a photochemical or as an electrochemical reaction. The American Samuel Lind (1879-1965) and Mund prefer the electrochemical point of view: radioactive radiation leads to the formation of ions surrounded by clusters of neutral molecules. Eyring, Hirschfelder and Taylor opt for the photochemical hypothesis: the excitation of molecules. In the light of further research Mund later admits his erroneous view.

Around 1950 he postulates the following synthesis: radioactive radiation loses its energy by withdrawing electrons from surrounding molecules or by bringing them in a level of higher energy. The electrons are absorbed by other molecules and turn them into anions. Those anions or free-moving electrons react with positive ions and lead to molecules in a higher energetic state, which break up into radicals, who again react with neutral molecules or with other radicals to make new stable molecules.

### **Scientific contacts and international reputation**

When Albert Einstein (1879-1955) leaves Nazi Germany in 1933, he remains a few weeks in Belgium (De Haan) on his way to the USA and during this period he meets Mund at his home in Leuven. Georges Lemaître (1894-1966) and Auguste Piccard (1884-1962) also belong to Mund's inner circle.

Letters by Mund to Maurice de Broglie (1875-1960) in 1932 at the Laboratoire de Physique des Rayons X in Paris still exist (Maurice is the brother of Louis – 1892-1987)

In connection with the trial of Han Van Meegeren (1889-1947), the master-forgery of Vermeer's paintings (1632-1675), the family Van Beuningen asks for his scientific expertise. Mund casts doubts on the superficial way the experts have acted. There remains an exhaustive correspondence about this subject.

In 1924 he designs an apparatus to enrich radium from Katanga. In South-Kivu (Congo) ex-students of Mund have discovered a new mineral of aluminium-uranylphosphate,  $\text{Al}(\text{UO}_2)_3(\text{PO}_4)_2(\text{OH})_3$  and in his honor call it *mundite*. In the Museum of Middle-Africa in Tervuren, there are 6 samples on view of this lightish-yellow orthorhombic mineral.

Mund is seen as the pioneer of the medical applications of radioactivity. He designs an apparatus to make the waters of Spa and Montecatini-Terme radioactive. He already has found a way to extract and purify radon.

In 1942 a serious explosion of a stock of ammonium nitrate destroys a wing of the plant at Tessenderlo. Mund is designed as an expert and proves that the plant is not to blame. Mund remains active as an adviser in Tessenderlo, as well as to the Union Minière du Katanga.

The *Institut Supérieur de Philosophie* of Leuven publishes his lecture: “*Le Language de la Physique*”. The other lectures in the same spirit are written by Louis de Raeymaeker and Jean Ladrière, respectively about « *La relativité de notre Connaissance* » and « *Concepts Scientifiques et Idées Philosophiques* ».

Mund is a well-known guest-speaker on international meetings of industrial chemistry. He is awarded the Decennial prize for Chemistry of the Belgian Government in 1939; a prize presented by the Société Chimique de Belgique bears his name.

On August 13, 1923 Mund marries Ludmilla Donchillo (1901-1976), of Russian-Rumanian descent and one of his first female graduates. They have 4 children; their son Robert is a well-known painter and psychiatrist who dies near Paris in 1993.

Mund is found by his wife at the bottom of the stairs in their house after an excruciating evening at the laboratory in the early hours of August 15, 1956.

Paul Balduck – May 2009 - Transl. Yves De Cock