

WALTER LWOWSKI, NEW MEXICO'S GREAT ORGANIC CHEMIST

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ABSTRACT

Walter Lwowski was born in 1928 in Garmisch, Bavaria, Germany and passed away in Las Cruces, New Mexico, USA in 2010. He received a doctorate in organic chemistry (Dr. Rer. Nat.) from the University of Heidelberg in 1955. He held faculty positions at Yale University and New Mexico State University. His main research activities dealt with nitrene chemistry and nitrogen heterocyclic chemistry. His wide and important contributions gained him national and international recognition and he may be rightfully considered New Mexico's greatest and most illustrious organic chemist.

KEYWORDS: History of Chemistry, Organic Chemistry, Nitrenes, Nitrogen Heterocyclic Chemistry, Chemistry in New Mexico

RESUMO

Walter Lwowski nasceu em Garmisch, Bavaria, Alemanha em 1928 e faleceu em Las Cruces, Novo México, Estados Unidos em 2010. Ele recebeu o título de Doutor em Química Orgânica (Doctor Rerum Naturae) da Universidade de Heidelberg em 1955. Ocupou cargos de professor em Yale University e New Mexico State University. As suas atividades de pesquisa trataram da química do nitreno e da química dos compostos heterocíclicos do nitrogênio, As suas contribuições amplas e importantes levaram a seu reconhecimento nacional e internacional e ele pode ser considerado o químico orgânico mais ilustre do Estado do Novo México.

PALAVRAS CHAVE: História da Química, Química Orgânica, Nitrenos, Compostos Heterocíclicos do Nitrogênio, Química no Novo México

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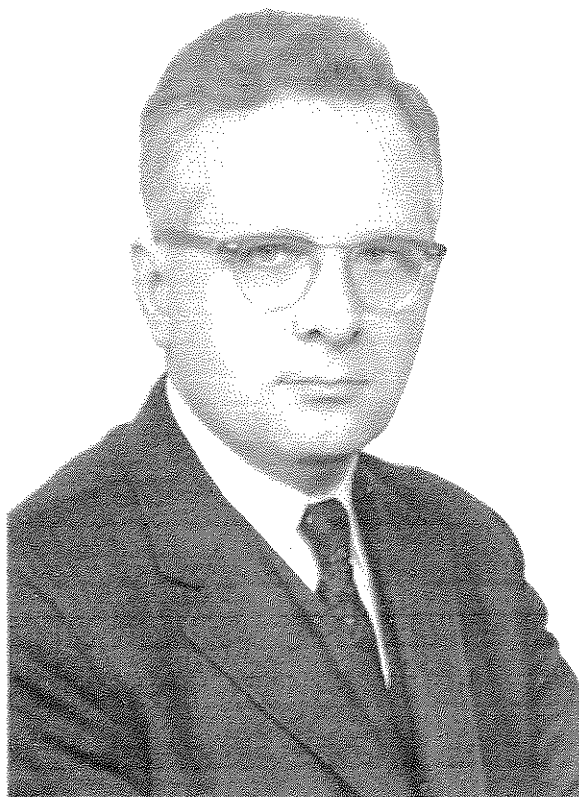
Walter Lwowski was born in Garmisch, Bavaria, Germany on December 28, 1928 and passed away in Las Cruces, New Mexico, USA on April 19, 2010. Garmisch is a beautiful town in the Bavarian Alps and is also the birth place of Richard Strauss and Karl Popper.

He received the degree of Diplom Chemiker from the University of Heidelberg in 1954 and the Doctorate in Organic Chemistry (*Doctor Rerum Naturae*) also from Heidelberg in 1955. During the same year he immigrated to the United States. Many promising young scientists from throughout the world were attracted to America during this period, very much alike to what happened during the golden age of the Roman Empire when the world's best scientists went to Rome.

Walter Lwowski did postdoctoral work with Donald J. Cram (Nobel Prize in Chemistry in 1987) from 1955 to 1957 and with Robert B. Woodward at Harvard University from 1957 to 1960. At Harvard , he was part of a team that worked on the total synthesis of chlorophyll, a research for which R.B. Woodward received the Nobel Prize in Chemistry in 1965.

From 1960 to 1966 he was a faculty member of the Chemistry Department of Yale University .

In 1966 Walter Lwowski joined New Mexico State University



PROF. Dr. WALTER LWOWSKI (1928-2010)

as *Research Professor of Chemistry*, a position that he held until his formal retirement in 1991. His help and effort was instrumental in the development of the Graduate Program in Chemistry that began at NMSU in 1964. After formal retirement, Dr. W. Lwowski stayed as Emeritus Research Professor, retained an office and laboratory in the Chemistry Department and remained active until his death. In addition to research, he helped maintain research instruments and helped develop chemistry demonstration equipment for undergraduate instruction.

His research interest dealt mainly with nitrene and nitrogen heterocyclic chemistry. Specifically, it treated electron deficient species, especially nitrenes and their generation, reaction mechanisms and synthetic applications. The construction of nitrenes with various reactivities, insertion into C-H bonds, reaction with unshared electron pairs on sulfur and modification of nucleosides by reaction with nitrenes received special attention.

Other topics of research involved the migration of heteroatoms such as N and O, aminimides containing adjacent N⁺ and N⁻ in five-membered rings, mesoionic heterocycles and large heterocycles.



Garmisch, Bavaria, Germany, Birthplace of Prof. W. Lwowski.



Garmisch in the Bavarian Alps is also the Birthplace of Richard Strauss and Karl Popper.

Prof. Dr. Walter Lwowski trained a large number of master and doctoral students and postdoctoral fellows. His research was supported by substantial grants, especially from the National Institutes of Health and the National Science Foundation.

A list of representative publications is given at the end of this article.

Prof. Dr. Walter Lwowski was a widely respected person at New State University. He came to Las Cruces in 1966 after leaving the Chemistry Department of Yale University and accepting the position of *Research Professor of Chemistry* at NMSU.

At the time, New Mexico State University had a special and somewhat unique way of promoting high quality research and propagating the name of the University in the highest scholarly circles.

This was the Research Center. It had its own building with first class laboratories and auxiliary facilities and with special attention from the administration.

The first *Research Professor* was Clyde W. Tombaugh, discoverer of Pluto, our illustrious teacher and world famous astronomer. He discovered Pluto in 1930 at the age of 24. This explains in part why

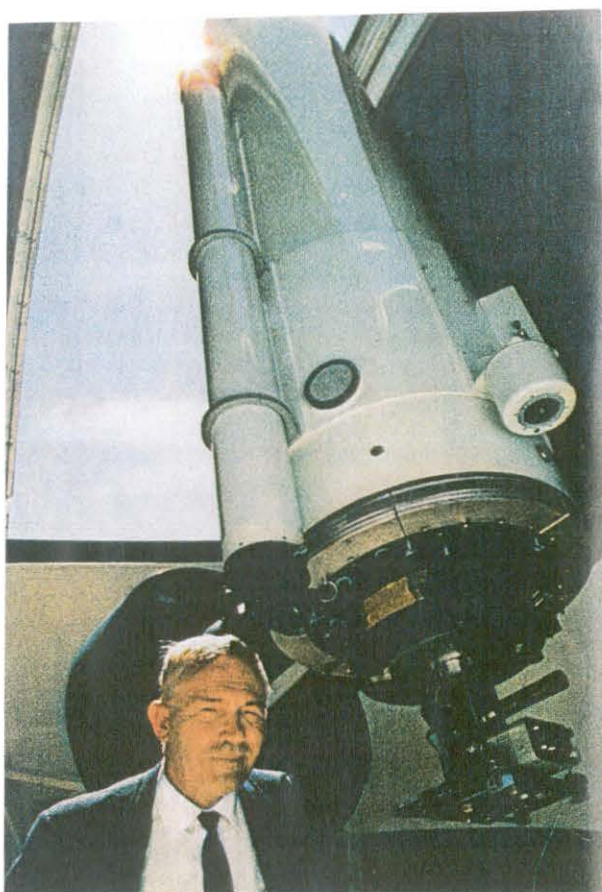
the Department of Astronomy was one of the best at New Mexico State University. In the 1960's there were also Research Professors in Mathematics and Biology.

Clyde W. Tombaugh (1906-1997) was a great, friendly, humble and very knowledgeable person. He was always present at the of meetings of the Astronomical Society of Las Cruces, where he was often the main attraction and the center of attention. His comments and reflections about extra-terrestrial life, space travel, astronomy and life on Earth were always full of insight, deep perception and wisdom. In Mesilla Park, where he used to live, he was the most distinguished and widely respected member of the community.

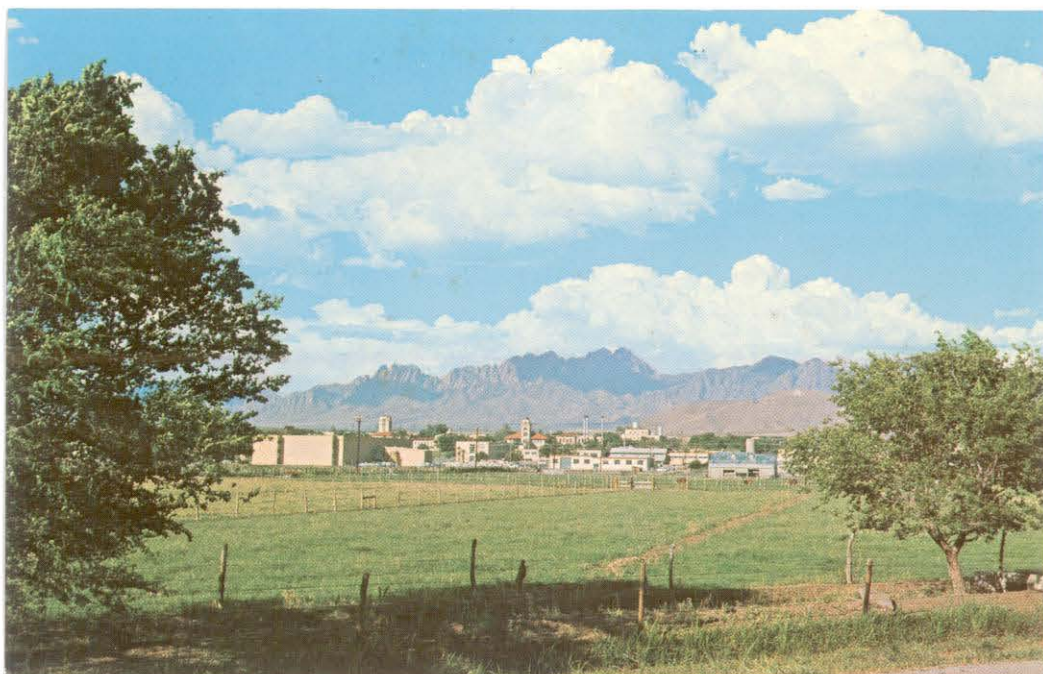
His office at the Research Center was always open to students and we still remember when we visited him in the 1960's and he gave us reprints of some articles about the discovery of Pluto and voyage to the planets.

Clyde W. Tombaugh and Walter Lwowski eventually became good friends and they used to go to lunch together very often. Later, the two of them and other researchers formed an almost formal "lunch group". Frank Harary, of Department of Computer Science at New Mexico State University, gave a detailed description of the highly

scholarly lunch group in an article published in *Solstice*, Vol. 8, No.1, Summer 1997 ("To the Memory of Clyde Tombaugh, 1906-1997").



Prof. Clyde W. Tombaugh, Discoverer of Pluto, W. Lwowski's Friend and Our Illustrious Teacher of Astronomy.



General view of New Mexico State University. Picture taken from Mesilla Park, New Mexico in the 1960's.



Organ Mountains near Las Cruces, New Mexico .

Prof. Dr. Walter Lwowski was a very formal person, a "*Hern Professor*" of the Old School. He was almost always using a suit and tie. His daily rounds in the laboratory, where he verified the progress in the work of the graduate students and postdoctoral fellows were twice a day, about nine o'clock in the morning and early in the afternoon. Most of his collaborators tried to be at their posts at their laboratory benches during these visits.

Among his many graduate students, we remember two that were very different. One of them was Richard Moore, now deceased, who completed his Ph. D. Degree in the early 1970's. He was the biggest and probably the strongest person on the NMSU campus. The other was a Chinese student who completed the M.S. Degree and whose name we shall not mention. He was often absent at Prof. Lwowski's daily rounds and caused him some preoccupation. This fellow spent a lot of time, especially at the beginning of each month at the horse track or the dog races in Ciudad Juarez, Chihuahua, Mexico. Both of them gave Prof. Lwowski some extra work and worries.

Among his postdoctoral fellows we remember two, mainly because they worked very hard and were very serious and responsible. One was Dr. Siegfried Linke from Germany. The other was Dr. Walter Judd from New Zealand.

All chemistry students at New Mexico State University had high respect and admiration for Professor Lwowski and in some way he represented the image of a great chemist, the important scientist that they wanted and dreamed to be some day.

The graduate students made a point of greeting him when they met in the hallways of the Chemistry Building saying loudly “*Good morning* “ or “*Good afternoon Dr. Lwowski*”. At times he would answer the greetings. Other times, it appeared that he did not notice the person or persons that just passed by him and simply ignored them. He might have been distracted, involved in deep thoughts or reflections or in a stern mood. What was really happening is still a mystery.

One day, two of his collaborators (S.M. Abdul Hai, a doctoral student from Pakistan and Dr. Walter Judd, a postdoctoral fellow from New Zealand) successfully completed a synthesis that was very difficult. They decided to celebrate and invited me to lunch. The three of us went to Len’s, at the time one of the best restaurants in Las Cruces. It had a unique setting and decoration with a stairway descending into a cavern with an artificial stream and fish.

As we stood in line, waiting to be seated, Walter Lwowski and Clyde W. Tombaugh passed by us. They had special and preferential treatment. The three of us, including his two collaborators, greeted them. Prof. Lwowski passed by us and seemed not to have noticed or heard anything. After they were a few steps away, Prof. Clyde W. Tombaugh stopped, returned and came in our direction. He gave me a tap on the shoulder and said *"Hi Lavinel, how are you doing?"*. Walter Lwowski looked amazed and very surprised, but continued on his way. Of course, I knew Prof. Clyde W. Tombaugh very well from the meetings of the Astronomical Society of Las Cruces, the Department of Astronomy at NMSU and from Mesilla Park, where we both used to live.

One of the excellent events at New Mexico State University was the Chemistry Seminars Program.

Unlike many institutions throughout the world, at NMSU the guest speakers were encouraged to interact and speak to as many faculty members and students as possible. The seminars were attended by all faculty and all graduate students and usually included the serving of refreshments.

Unfortunately, we remember many institutions in three continents

where the guest speaker was literally hidden or shown off by his host and was kept away from the students, considered second class citizens. Some were rushed to the airport as soon as they finished the lecture. Attendance at seminars was not compulsory and at times the audience was very small since the topic was physical chemistry or was too specialized.

In the 1960's at New Mexico State University, all the faculty members and graduate students were strongly encouraged to attend all seminars. We still remember guest speakers such as Fred Basolo, Stanley L. Miller and Harry B. Gray.

All visitors received special, "vip" treatment. They usually landed at the International Airport in El Paso, Texas and dined at the best restaurants in El Paso, Ciudad Juarez or the Las Cruces area.

We remember places like the Camino Real in Cd. Juarez and La Hacienda in Mesilla , where the Wells Fargo Coaches used to stop one and a half centuries ago. During his stay in Las Cruces, the guest speaker had some time reserved to go to lunch with a small group of graduate students.

During Harry B. Gray's visit to Las Cruces, Prof. Lwowski was one of his hosts. The story goes that they went to dinner at La Hacienda,

an excellent restaurant in La Mesilla, with beautiful settings, gardens and wild birds. Walter Lwowski was a good connoisseur of wines. When the wine list came, Harry Gray gave it to Lwowski to choose the wine. After much selection and no decision, the guest became a little impatient and said: "*The hell Walter, let's take a gallon of Gallo !*". At the time, Gallo was one of the cheapest wines produced and sold in California.

The next day, Harry Gray asked some graduate students to take him to lunch to the cheapest restaurant in Las Cruces. They accompanied him to La Casita, where a sopaipilla and a coke costed 25 cents. He liked it and enjoyed the lunch and the company of the graduate students very much.

As far as we know, Prof. Dr. Walter Lwowski never married. His main devotion in life was chemistry. He liked very much chemical instruments, especially NMR spectrometers. One of his hobbies was to repair instruments and cars. When the Chemistry Department at the University of Texas at El Paso (UTEP) acquired the first NMR instrument, the workers managed to drop it and damaged it while unloading. Prof. Dr. Walter Lwowski went to El Paso and got it working in perfect conditions in a few hours.

Tetrahedron
Volume 46, Issue 22, 1990, Pages 7599-7659

The total synthesis of chlorophyll a

Robert Burns Woodward¹, William A. Ayer, John M. Beaton, Friedrich Bickelhaupt, Raymond Bonnett, Paul Buchschacher, Gerhard L. Closs, Hans Dutler, John Hannah, Fred P. Hauck, Shō Itō, Albert Langemann, Eugene Le Goff, Willy Leimgruber², Walter Lwowski, Jürgen Sauer, Zdenek Valenta and Heinrich Volz

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**The author in front of the Old Chemistry Building
at New Mexico State University in the mid 1960's.**

Being from the Bavarian Alps, Walter Lwowski liked mountain climbing. He hiked the Organ Mountains near Las Cruces from one end to the other.

Having been born the same city as Richard Strauss, Prof. Walter Lwowski liked classical music and was a patron of the Las Cruces and El Paso Symphony Orchestras.

Prof. Dr. Walter Lwowski bequeathed a major portion of his estate to New Mexico State University to create an endowment for the maintenance, repair and purchase of chemical research instruments for the Department of Chemistry and Biochemistry.

Prof. Dr. Walter Lwowski was a member of the Editorial Board of several journals including the *Journal of Organic Chemistry* and the *Journal of Heterocyclic Chemistry*.

He was also a member of the Editorial Board of the *Southern Brazilian Journal of Chemistry* since its founding and gave us special assistance, especially during the early stages.

Prof. Dr. Walter Lwowski made fundamental and important contributions to chemistry and earned widespread national and international recognition. He may be rightfully considered New Mexico's greatest and most illustrious organic chemist.

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