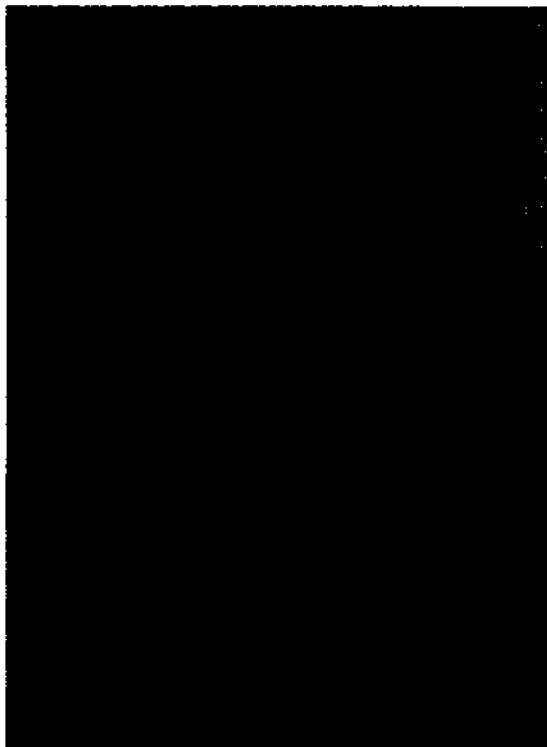


## Preface



### **Luigi Sacconi** **February 1911–September 1992**

Luigi Sacconi was born on 28 February 1911 in S. Croce sull'Arno, between Florence and Pisa, Italy. This volume is intended to be a tribute to the Maestro from most of his pupils. It is a witness of the results of his teaching.

In the 1950s, progress in chemical sciences profited from the explosion of initiatives and results in the field of inorganic chemistry. The popularization of Pauling's ideas on the chemical bond involving transition metal ions, and a rediscovery of the crystal field theory furnished the theoretical tools for the planned synthesis of new, and at that time bizarre, compounds and for their characterization. This field is now a heritage of chemistry as a whole and is known as the chemistry of coordination compounds. At the beginning of the second half of the century, electron-

ics and computers provided scientists with new powerful tools for understanding the electronic structure of chemical compounds, tools which had not been conceivable up to then and which allowed the rapid scientific and technological progress of our civilization.

Sacconi was ready from 1947 to contribute to the progress of science with his personality, characterized by imagination, critical evaluation of the scientific projects, and charm, which allowed him to establish personal contacts at national and international levels. Finally, he was gifted in judging people, a characteristic which helped in the success of the School. He also had a deep sense of honesty which soon made him sympathetic to the American world.

Until 1947, his life was quite adventurous. The son of a primary school teacher who never joined the fascist party and was persecuted by the political establishment, Luigi breathed from infancy the air of liberalism and free-thinking. In 1928, he joined the Navy and studied to become an engineer. In the Navy, he was protected from swearing loyalty to fascism. In 1931, the political events affecting his family, and personal reasons, kept him away from official life. In 1938, he was among the founders of an underground anti-fascist group in Florence. During the war, he joined the underground movement against the Germans, fighting in favour of the Anglo-American Allies. After the war, he was engaged in the reconstruction of the democratic structures of the country; he had positions as opinion leader in the national press and in the administration of the University of Florence.

In 1941, he obtained the degree of Doctor of Pharmacy at the University of Florence, obtained a position at the University of Parma and, in 1942, moved to Turin where he obtained the degree of Doctor of Chemistry. During the negotiations for the surrender of Italy in the war, the Faculty of Science of the University of Florence offered him a position that he accepted.

Following the war, all of his talent was devoted to research and teaching. Many of the best students studied under him and some of them are now in key positions in various national and international institutions. Maria Bencini graduated with him in January 1945 and enjoyed her tutor so much that she became his companion for life. She also shared his political passion and played the game of the anti-fascist resistance.

Among the contributors to this volume, Calderazzo graduated in 1952, Paoletti in 1954, and Ciampolini, Orioli and Sabatini joined Sacconi between 1956 and 1958. Vacca obtained his degree with Sacconi in 1961, Di Vaira in 1963, myself in 1964, Barbucci and Mani in 1965, Midollini in 1966, Fabbrizzi, Gatteschi and Mealli in 1969, Benelli and Scozzafava in 1971, Bianchini and Micheloni in 1973, Bencini in 1975, Luchinat in 1976, Banci in 1978, etc.

Sacconi became full professor in 1954 in Palermo and from 1960 he joined the Faculty of Science in Florence. He retired from active teaching in 1981, but maintained his chair, and became emeritus in 1986.

During and just after the war, there was nothing in the chemistry department

to do research with. There were some electric accumulators which had been used for contacting the allies during the 11 days of the liberation of Florence. This is now witnessed by a stone in the facade of the Chemistry building.

Since essentially nothing was available for research, he started working on the absorption of compounds on alumina. He did not need much indeed. His first paper in English, on the mechanism of inorganic chromatographic absorption on activated alumina, dates back to 1949 and was published in the *Transactions of the Faraday Society*.

Finally, he discovered in the cellar, a balance for magnetic measurements. It consisted of a current rectifier to generate a magnetic field and a balance. Renato Cini, now Professor of Technical Physical Chemistry, adapted it for magnetic measurements by the Gouy method. In 1949, he published a paper in Italian on the magnetic properties of uranium(IV) complexes with coordination number eight. In 1950, he published a paper in the *Journal of Chemical Physics* on hydrated molybdenum blue and in 1954 one in the *Journal of the American Chemical Society* on acidic solutions of molybdenum(V). He suggested the dimeric nature of the latter and a direct Mo—Mo bond on the basis of magnetic susceptibility measurements. Lately, during the ICCS in Stockholm in 1960, Harry Gray mentioned these results during his talk, referencing Sacconi's work properly. Sacconi did not catch what Harry was saying. At the end of Harry's talk, Sacconi went to him saying that he had already studied these systems. Harry explained to him that this was just what he had said and so Sacconi calmed down. Since then, the friendship between Luigi and Harry has been very deep and touching.

Soon Sacconi developed his interests in absorption spectroscopy. His first paper dates back to 1954 in the *Journal of the Chemical Society*. In 1960, he started publishing, first with Paoletti and then also with Ciampolini, results obtained with a calorimeter and, together with Sabatini, results on the vibrational spectroscopy of metal complexes.

These biographical notes give the dimension of the scientist who used all the techniques available on the market for the investigation of the structure of coordination compounds. It would do no justice to his contribution to science to attribute to any one of these techniques a pre-eminent role in his research. Indeed, he used to refer to himself as a synthetic chemist and all of his students had to start by preparing some coordination compounds.

He approached X-ray with Orioli in 1962. Orioli then visited Lingafelter in Seattle and learned to solve three-dimensional structures. In 1963, both the characterization and the X-ray structure of the "first tetrahedral nickel complex with bidentate ligands" appeared in the literature. I was a young student but could catch the exciting atmosphere in the laboratory. Sacconi's laboratory had succeeded in clarifying the structure of bis salicylaldiminato nickel(II) complexes beating (according to Florence and to history) the laboratory of Dick Holm at MIT (!).

In 1965, he published the characterization of the "first high-spin five-coordinate

nickel(II) complex". Research on the new branch of five-coordinate coordination compounds was pursued till 1975, providing a large variety of five-coordinate compounds with many donor atoms and with unusual magnetic properties. This gave great international prominence to the School of Florence. Such compounds were subsequently taken as models for the coordination polyhedra of metalloproteins. I joined part of these researches between 1966 and 1975 by helping in the chemical synthesis and performing ligand field calculations. Most importantly for me, Sacconi decided to develop the technique of NMR as applied to paramagnetic complexes in 1965 and he sent me to ETH, Zürich, to perform NMR measurements on the "first high-spin five-coordinate nickel(II) complex".

In the final years of his research activity, he was attracted by low oxidation states of nickel and cobalt. He prepared and characterized very many peculiar compounds such as those containing the tetrahedral-tetraphosphorus and cyclo-triphosphorus ligands, and those described as triple-decker sandwiches.

Al Cotton, in a letter to Fred Basolo dated 23 August 1979, wrote: "I think Sacconi has been running a first class operation for a long time, more consistently than anyone in Italy. The work they are doing today is better than ever; it is absolutely first class...".

In one of the latest interviews to a local newspaper, Sacconi said: "My pupils are a good number and, if they will keep on the right track, the Florentine tradition of coordination chemistry will still flourish. That makes me happy".

Ivano Bertini  
28 February 1992