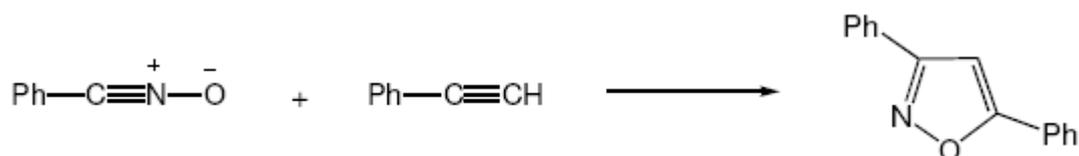


Giovanni SPERONI

Giovanni Speroni (1910-1984) graduated in Chemistry in 1932 with a thesis on the synthesis of organo-selenium compounds under the supervision of Raoul Poggi, and continued these studies in the following years. In 1933 he graduated also in Pharmacy. When in 1937 Adolfo Quilico arrived in Florence as professor of General Chemistry, the young assistant Speroni became involved in the research line on isoxazole developed in Milan since 1929 by Quilico and his scholars. The formation of isoxazole derivatives without 3-substituents, observed in reactions of nitric acid with acetylene and other organic compounds, suggested that fulminic acid (HCNO) could be a key intermediate. Indeed, Quilico and Speroni found that fulminic acid and acetylene produced isoxazole derivatives, the solvent acetone being involved in the reaction: the result was encouraging [*Gazz. Chim. Ital.* **69**, 508 (1939)]. Similar remarks concerned benzonitrile oxide (C₆H₅-CNO), an aromatic analogue of fulminic acid: the presence of diphenylfuroxan, dimer of benzonitrile oxide, as a side product in the known synthesis of isoxazole derivatives from benzohydroxamoyl chloride and sodium enolates, suggested that benzonitrile oxide might be a reaction intermediate. In fact the same products were obtained by using isolated benzonitrile oxide instead of benzohydroxamoyl chloride. Moreover,



SCHEME 1

compounds with a carbon carbon triple bond reacted with benzonitrile oxide leading to the expected isoxazole derivatives [*Gazz. Chim. Ital.* **76**, 148 (1946)]: these methods were indicated as “fulminic synthesis of isoxazole”. The analogy with reactions of diazoalkanes to pyrazoles and of azides to triazoles, previously described, was emphasized, thus opening the way to the concept of 1,3-dipolar cycloaddition reactions. Speroni gave other important contributions to the chemistry of isoxazole, by elucidating the structure of Betti’s acids [*Gazz. Chim. Ital.* **82**, 691 (1952); *ibid.* **83**, 192 (1953)] and with extended studies of physical properties of isoxazole and of its derivatives (see below).

After the war Speroni became assistant to Giorgio Piccardi as in the meantime Quilico had moved to Milan University. In 1948 he resigned, maintaining reduced teaching commitments, while he became Director of the Centre on Phytodrugs of the Società Montecatini, located near Signa (not far from Florence). He presented a review on this topic at “Le giornate della Chimica” at the Fiera di Milano in 1956 [*La Chim. e l’Ind.* **38**, 944 (1956); *ibid.* **39**, 184 (1957)]. This activity led to the preparation of a phytodrug of the family of thiophosphoric esters patented under the name of ROGOR: “the active matter is N-monomethylamide of O,O-dimethyldithiophosphorylacetic acid [(CH₃O)₂PS-S-CH₂-CO-NH-CH₃]. Since it has a strong antiparasitic activity combined with a low toxicity against warm-blooded animals, it is very useful for spraying fruit trees” [Patent US 3004055, *Chem. Abs.* **55**, 34641 (1961)].

Giovanni Speroni’s scientific interest focused not only on synthetic Organic Chemistry but also on the physical properties of organic compounds, in view of the important structural information that these could provide. Thus, in the review by Quilico on Isoxazoles [A. Quilico in “The Chemistry of Heterocyclic Compounds” (ed. A. Weissberger), vol. XVII, Part I: Isoxazoles and related Compounds, N.Y. Interscience 1962], Giovanni Speroni is author of the chapter on “The Physico-Chemical Properties of Isoxazole and Its Derivatives” [p. 177-222, references therein]. Several

properties of isoxazole and its derivatives are to be found therein: density, surface tension, water solubility and their dependence on temperature suggest an enhanced self-association of compounds with a free 3-position. Extended investigations were devoted to the measurement of dipole moments of isoxazoles in benzene vs dioxane solution. Speroni developed and constructed the apparatus for the evaluation of dielectric constant and dipole moments of organic molecules [Fig.1 and Fig. 4 in G. Speroni, "Misura di costante dielettrica di liquidi non conduttori", Marzocco, Firenze 1950].

Measured dipole moments of functionalized isoxazoles support the rationalisation of structure and properties of "Betti's acids" [*Atti Accad. naz. Lincei, classe Sci. fis. mat. nat.*, **13**, 75 (1952); *Gazz.*

Chim. Ital., **82**, 691 (1952)] and of isoxazole carboxylic acids [*Atti Accad. naz. Lincei, classe Sci. fis. mat. nat.*, **12**, 704 (1952) ; **13**, 39 (1952)].

More information concerning the conjugation patterns are obtained from UV spectra of isoxazole derivatives. In systems susceptible to tautomerism, such as isoxazolin-5-one derivatives, UV spectra are compared with those of the methyl derivatives corresponding to each tautomer in the same solvent. Thus, equilibria in different solvents can be approximately evaluated [VIII Congresso Naz. di Chimica, Torino, 1958, Atti, p.137]. This method has been exploited later by other Authors. When Speroni became full Professor of Organic Chemistry in Naples University (1952), a fruitful cooperation and a life-long friendship was established with Salvatore Califano, giving rise to research on IR and Raman spectra of isoxazole and nitrile oxides [*J. Chem. Phys.* **26**, 1777 (1957); *Atti Accad. naz. Lincei, classe Sci. fis. mat. nat.*, **23**, 263 (1958); *Spectrochimica Acta*, **15**, 86 (1959); **19**, 1145 (1963)]. In the same period, some isoxazolin-5-one acetals were obtained by cycloaddition of nitrile oxides to ketene acetals [*Gazz. Chim. Ital.*, **89**, 1511 (1959)].

In the course of his life Speroni has always been deeply interested in cultural heritage: as early as in the late thirties he studied archaeological findings from Etruria. A bronze vase, analysed by gravimetry as well as by spectroscopic and polarographic methods, revealed that the alloys of the vase and of the handle had different compositions, suitable for different modelling procedures [*Studi etruschi*, vol. XIII, 351 (1939)]. Several lead objects from the Archaeological Museum in Florence were similarly analysed, showing minor impurities (Cu, Bi, Ag and in some cases Sn or Sb) besides Pb, pure over 99%: these might provide a clue as to the origin of the material [*ibid.*, vol. XIII, 355 (1939)]. From the same Museum, Speroni studied a large terracotta jar found near Populonia [*ibid.*, vol. XIV, 309 (1940)] and, later, the composition of 40 silver coins from the "Populonia treasure", including the patinous deterioration [*ibid.*, vol. XXI, 241 (1950-51)].

Speroni's interest in cultural heritage turned to concern for the precious works of art damaged during the 1966 flood that hit the city of Florence. He put his vast experience at the disposal of the community, facing unprecedented problems in restoration. On his advice, a commercial acrylic resin called Paraloid B 72 was used as a transparent and removable glue for reinforcing paintings. Since then this particular resin has come to be used widely for this purpose. Speroni suggested also storing the paintings that had been done on wooden panels in a large hall with controlled humidity, in order to create a gradual drying process.

He was awarded several medals and received acknowledgements among which, on the occasion of the first anniversary of the flood, a testimonial and a medal from the Ministry of Public Education for his contribution to the preservation of cultural heritage during the emergency.



Speroni receives the testimonial from the Ministry of Public Education

Speroni had a rare ability for organization and far-sighted initiatives. Thus, he contributed to the outset of periodic meetings on Organic Chemistry which later became the Conferences of the Organic Chemistry Division of S.C.I., and to the organization of National Conferences on Pericyclic Reactions. The C.N.R. Centres on Heterocyclic compounds and on Preservation and Restoration of Cultural Heritage were created in Florence under his impulse. He contributed also to the management of Florence University as a vice-Rector and as Dean of the Faculty of Sciences in the seventies, during a delicate period of transition within the University.

He did not dislike manual work such as carpentry, gardening, cookery, with excellent results. However, among his hobbies, music had a privileged position, possibly originating from childhood, because his mother had been a piano and singing teacher at the “L. Cherubini” Conservatory in Florence. Once he was asked what music meant for him. After a while, he answered: “Music is the most important thing in my life”.

Francesco De Sarlo