

More than a Founding Father

Walter Kohn in flesh and bone

I first met Walter Kohn during the summer of 1994, when I attended the ITP program on Quantum Many-Body Computations for Condensed Matter Physics, at the invitation of David Ceperley, one of its Directors. It is always a great emotion to meet a Founding Father of your field of research at long last. More so if the meeting venue happens to be named after him – the Kohn Hall. You may not realize that, but you secretly expect a wise man with a long white beard and a halo shining above his head; or at least, extrapolating from previous experiences with much less prominent colleagues, an infinitely busy and self-conscious person who will barely notice your presence. Well, Walter's look and his way of attending seminars and meeting people were antipodal with respect to these expectations: he would appear genuinely interested in people and arguments, and would often be the first to nicely introduce himself to younger ground-state scientists like myself. However, I was not the only one who saw the halo, judging from the way the eyes of all attendees (not to mention the speaker) would turn to him whenever he quietly asked some questions or made some comments. Meeting him personally certainly refined, but ultimately increased my religious reverence, as witnessed by my little poem in Italian and my drawing below. Both were done right after coming back from a brunch at Mara and Walter's, where I had the very pleasant surprise of being invited together with a few other participants in the program. My art work was shown to some of the Italian colleagues there (Stefano Baroni, Roberto Car, Raffele Resta, Annabella Selloni, Gaetano Senatore) and has since been hanging in my office in Rome. It was not until last year that I dared give a copy to Walter.

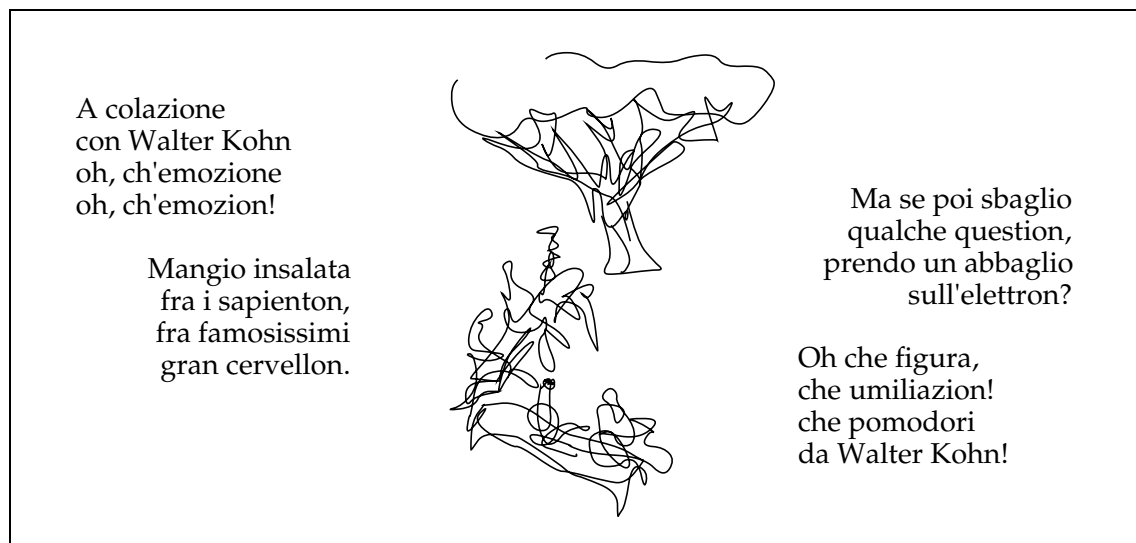


FIG. 1: Drawing and poem after my first visit at Mara and Walter's home (and garden) in Santa Barbara, July 1994. The English translation reads: A brunch at Walter Kohn's / how exciting, how exciting! / I'm eating salad among wise guys / among most famous Big Brains. / But what if I miss some question / I make a blunder on the electron? / What a poor figure, what a humiliation! / Rotten tomatoes from Walter Kohn!

The Nobel prize

The news that Walter had won the Nobel Prize in Chemistry reached me in China, where together with Mario Tosi and Norman March I was attending the 9th International Symposium on the Physics of Materials. I was very proud to add a handwritten line of breaking news near Walter's name in one of my first viewgraphs. Proud? Of course I was not the inventor of the Density Functional Theory – I was just one of the hundreds, maybe thousands of its users and developers in the field of condensed matter physics. And besides, when Michael Schlüter and Don Hamann had introduced me to its mysteries, that marvelous theory was already fifteen years old. But even so, I felt that a tiny fraction of that glory was bouncing back to me as my memories went back, again and again, to the brunch in the Kohns' delightful garden.

The Holy Year

Back in Rome, I was invited by Umberto Grassano, a good friend of my thesis advisor Franco Bassani, to join the program committee of one of the many academic events scheduled for the Holy Year 2000. Though an active Church member and a physicist, I was not sure I was the right man for the job. But Umberto was very serene when he insisted that my presence was needed because he was sick and might not be able to follow the work through (as a matter of fact, he died in May 2000). I decided to join in and the committee agreed that, rather than having a conference of 'Catholic scientists', we would ask a top-level, religion-blind set of speakers to illustrate the 'Physics of the 21st century', with just one panel session devoted to religious and philosophical discussions. Each one of us was supposed to find speakers of appropriate standing within his or her own field of research. The first person that came to my mind was Walter Kohn, so I wrote him an e-mail message that Walter immediately answered.¹ His reply was very friendly: Walter told me that he had been raised in an ecumenical spirit and had many Catholic friends, but in his view the Vatican had missed the opportunity offered by the Jubilee to come to terms with its great failures during the Holocaust, some of which Walter had experienced firsthand (e.g. Vienna's Cardinal Innitzer greeting Hitler's envoy with the Heil Hitler salute). He reminded me that his parents and other dear ones had been murdered, and suggested putting together – and bringing to the participants' attention – a list of Jewish physicists who had been victims of the Holocaust, including his high-school teacher Emil Nohel, who had been Einstein's assistant. What could I reply? I admitted with shame that in the early stages of Fascism in Italy (and Nazism in Germany) the prevailing reaction of our highest authorities, but also of our local church leaders – and, alas, of ground-state Christians – had ranged from silent to enthusiastic. That certainly was not balanced by the few and soon exterminated Christian opposers of Nazism, such as the White Rose group in Munich, or by the Christians, nuns, priests and bishops who during the war had helped people chased by the Fascists and Nazis, as described for instance in Ben Cross' movie 'Assisi Underground', or as testified by the list of names displayed on the Avenue of the Righteous at the Yad va-Shem memorial in Jerusalem. I added that the Pope was expected to make a detailed, public apology for the historical responsibilities of the Catholic Church in early 2000. Finally I wrote Walter that in inviting him, besides obvious scientific considerations, I had hoped that our (bad) habits could be improved by a little help from 'good people' outside our Church. Again, Walter surprised me by replying almost immediately. And even more surprisingly, he wrote that one of his neighbors and friends in Santa Barbara was George Wittenstein of Hamburg, the only survivor of the White Rose group, whose name was totally unknown to me (all I knew was that all the group's members had been beheaded). Walter said he would like to wait for the Pope's

statements on the mistakes of the Catholics before a final decision on his participation. He added that he, in his scientific talk, was going to include a brief remembrance of the Holocaust victims, particularly his own teacher; to mention the responsibilities of all those who had kept silent in spite of the moral authority they possessed; and to emphasize, for the future, individual and collective responsibility when human rights are violated or threatened. To make a long story short, in the end Walter came and gave a wonderful talk exactly in these terms. Rather than blaming anyone for failing to speak out, he asked the audience a constructive and much more poignant question: ‘What are you going to do next time?’ The conference was followed by a large papal audience in the Vatican, at the end of which Walter was one of the few who were admitted to see the Pope, while most of us watched them from a distance on a large TV screen. I remember that his exchange with the Pope seemed to last longer than any other. Back to St. Peter's Square, on our way to the hotel, David Mermin and I were quite curious to hear about it. In his own recollection, Walter's words had been something like, ‘Your Holiness, I appreciated all your efforts towards a better understanding between the Christian and Jewish people’, to which the Pope had smiled and replied with a repeated ‘Thank you’. On the TV screen, that handshake had seemed to last forever. In remembering the time I had invited Walter, I was very touched by such a conclusion – but was that really a conclusion? On that very same day the Vatican document *Dominus Jesus* was published, which raised many comments both within and outside the Catholic Church. Walter in particular did not view it as a terribly promising new step in the direction of inter-religious relationships. Back in Santa Barbara, he felt the urge to express his concern directly to his new friend the Pope, so I gladly assisted him in the most unusual task of trying to have his personal letter delivered to the Holy Father. Monsignor Zycinsky, the Archbishop of Lublin and a Physics Ph.D., who had met Walter in Rome at the Jubilee of the Physicists² was of great help, so that a few weeks later, to my surprise, Walter told me that he had already received a (nice) answer from the Vatican. A longer account of this experience, in Walter's words, can be found in his talk, ‘Reflections of a Physicist after an Encounter with the Vatican and Pope John Paul II,’ given at UCSB in April 2001.³

Last summer in Santa Barbara

After that memorable time Walter and I kept in touch. Last summer, the ITP program on Realistic Theories of Correlated Electron Materials, headed by Ole Andersen, Antoine Georges and Gabi Kotliar, offered an opportunity to spend some more time together. When my turn came to give a talk, not only was Walter the first one to enter the room: he also threw me a life ring after a difficult question from Werner Weber. Apart from the official program, I learned a lot on new physics both at the Chemistry lunchtime seminar, to which he invited me, and in private conversations in his office, one of which was accompanied by Chinese tea of a very exclusive brand, prepared with his own hands. Another time, the Einstein pictures hanging in his office were the starting point for a moving and intellectually amazing account of the life of their author, a famous biologist and photographer who had first fled into Berlin from Russia after the Revolution, then from Berlin to the USA after the rise of Nazism. The photographer was none other than his father-in-law Roman Vishniac.

The rest of my family also had the privilege of Walter and Mara's company as they generously gave additional informal parties at their place besides the official ones. In such occasions Walter will deliberately leave physics out and allow everybody to enjoy his company and his humorous way of sharing his amazingly vast and profound human experience. At our program's social dinner I remember Walter walking into the AppThai restaurant, just by chance, among our four kids; his

first joke was to tell the waiter that he was their grandfather – *il Nonno*, he explained to them in Italian. In the following weeks we enjoyed many more happy times with Mara and Walter. The guacamole prepared by Walter's hands was as delicious as the conversation. The hats and sunglasses offered to the guests made the hospitality perfect. My wife Silvia was surprised to see that the only visible sign of Walter's Nobel Prize in their home was a small picture⁴ stuck with a magnet to the fridge among other family pictures and notes. In Silvia's view, that was very revealing of the Kohns' style and approach – it showed how proud Mara was of her husband, but also that their children and grandchildren were no less important to them than the King of Sweden. Even my children felt as important as kings when, on our last day in Santa Barbara, Mara paid us a surprise visit and brought them many farewell gifts including a few beautiful pictures of dolphins which are now hanging in their rooms at home.

Thank you, Mara; thank you and happy birthday, *Nonno* Walter! A spiritual and moral guide, a father and a grandfather—not just the Founding Father of the Density Functional Theory.

About the Author: Giovanni Bachelet is professor of Physics at the University La Sapienza of Rome. His research interests are in condensed-matter physics, and have covered the development of norm-conserving pseudopotentials within the Density Functional Theory, their application to a variety of solid-state systems and their extension to quantum Monte Carlo simulations. His most recent activity concerns the 3D and 2D electron gas and the electron-phonon interaction in magnesium diboride and related compounds. Contact: Dipartimento di Fisica, Università La Sapienza, piazzale Aldo Moro 2, I-00185 Roma, Italy; Giovanni.Bachelet@roma1.infn.it; <http://www.giovanibachelet.it/>.

¹ another scientist whom I thought of inviting – and who was fortunately able to attend – was David Mermin; his contribution is included in this book

² a contribution by Mons. Zycinsky is also to be found in this book

³ see <http://www.srhe.ucsb.edu/lectures/info/kohn.html>

⁴ similar to that appearing on the first page of this book