

Mentors, Memories, and Motivation...

Finding scientists who have not benefited from the encouragement and assistance of a mentor—at one point or another in their career—is, indeed, quite a daunting task. Most of us do not have to think very long or very hard to identify individuals who unselfishly devoted their time and energy to our development as scientists and engineers. Mentors are frequently, but not always, teachers who were willing to give that extra guidance, help, or encouragement that sometimes made the critical difference.

One of my early mentors was, in fact, not a teacher, but our family physician, Dr. Robert Slade. Often, I think that he found it difficult to treat my illnesses in the face of a barrage of questions about chemistry and acids and blood and the lenses in one's eyes. Once he realized how very serious I was, he took time to discuss my questions—often at length. (Well, ok, let's face it, M.D.'s today are not what they used to be!) Robert Slade practiced medicine in his hometown (that is, my hometown), and his little "high-school-days" laboratory—of the kind that so many of us had in our youth—still survived in the garret of his parents' home. Once I discovered this, I began to plot a way to get to see this old lab and perhaps convert some of the remaining apparatus to my own use—since Dr. Slade clearly had no need for any surviving equipment of this sort.

Finally, the day did come when Dr. Slade and I climbed the stairs to the attic that contained the scientific objects that had eventually and ultimately directed their youthful owner into the path of medicine. When I left that day, I carried incredibly exciting cardboard boxes full of clinking, dusty beakers and test tubes, Erlenmeyer flasks, and alcohol lamps. I also carried away two books: one on the life of Pasteur by Vallery-Radot and a second on the life of Marie Curie written by her daughter, Eve. Shortly after this, Dr. Slade became a U.S. Army physician in the 10th Mountain Division, which at that time was headquartered between Leadville and Vail, Colo. He moved his family to Colorado, and I lost my mentor.

The beakers and flasks and labware that I carried out of the attic that day, like Bobby Slade, M.D., are now all gone and broken. Books are more enduring than glassware and people, however, and recently, while looking for something else entirely in one of my bookcases, I accidentally came across the volume on the life of Madame Curie. When I pulled the book from the shelf, it automatically and magically opened to pages whose creasing had been long remembered and retained as a result of having been read and re-read by me and probably by the original owner. I share with you now some telling quotes from this remarkable biography that relate to the work of Pierre and Marie Curie on the isolation of radium, and in particular, to the conditions under which they did their research (see Excerpts).

Various reactions can occur on reading these passages. Three of my own thoughts are:

1. It amazes me how little motivation and encouragement scientists and engineers actually need to get them to work like mad.
2. Where in the world were all of the safety, industrial-hygiene, and radiological-protection people when this was going on? Certainly, any one of these groups would have instantly put an end to this nonsense once and for all, and we simply wouldn't ever have had to worry about radium and all that stuff.
3. Sometimes—in the face of vicious colleagues who live every day just to try to expose you in a mistake so they can build their own egos and prove how much smarter they are than you; in the face of weeks of work writing scientific proposals that receive outstanding ratings, and then are not funded anyway; in the face of administrators and managers constantly manipulating hidden agendas in the pursuit of blind ambition; in the face of all of these and the many other bad things that can and do

Excerpts from Madame Curie: A Biography (Doubleday, New York, 1938).

The room gave on a courtyard, and on the other side of the yard there was a wooden shack, an abandoned shed, with a skylight roof in such bad condition that it admitted the rain. The faculty of medicine had formerly used the place as a dissecting room, but for a long time now it had not even been considered fit to house the cadavers. No floor: an uncertain layer of bitumen covered the earth. It was furnished with some worn kitchen tables, a blackboard which had landed there for no known reason, and an old cast-iron stove with a rusty pipe....The shed in the Rue Lhomond surpassed the most pessimistic expectations of discomfort. In summer...it was stifling as a hothouse. In winter one did not know whether to wish for rain or frost; if it rained, the water fell, drop by drop... on the worktables, in places which the physicists had to mark in order to avoid putting apparatus there. If it froze, one froze....The stove...if one went near enough to touch it one received a little heat, but two steps away and one was back in the zone of ice.

It was almost better for Marie and Pierre to get used to the cruelty of the outside temperature, since their technical installation—hardly existent—possessed no chimneys to carry off noxious gases, and the greater part of their treatment had to be made in open air....When a shower came, the physicists moved their apparatus inside: to keep on working without being suffocated, they set up draughts between the opened door and windows....In such conditions, M. and Mme Curie worked for four years from 1898 to 1902.

In the division of labor, Marie had chosen the "man's job"....Marie continued to treat, kilogram by kilogram, the tons of pitchblende residue which were sent her on several occasions from St Joachimsthal. With her terrible patience, she was able to be, every day for four years, a physicist, a chemist, a specialized worker, an engineer and a laboring man all at once. Thanks to her brain and muscle, the old tables in the shed held more and more concentrated products—products more and more rich in radium....She was now at the stage of purification...of strongly radioactive solutions. But the poverty of her haphazard equipment hindered her work more than ever...she needed a spotlessly clean workroom and apparatus perfectly protected against cold, heat and dirt. In this shed, open to every wind, iron and coal dust was afloat which...mixed itself into the products purified with so much care.

They arrived in the Rue Lhomond and crossed the little courtyard. Pierre put the key in the lock. The door squeaked, as it had thousands of times and admitted them to their realm, to their dream....'don't light the lamps' Marie said in the darkness. Then she added... 'do you remember the day when you said: "I should like radium to have a beautiful color?"' The reality was more entrancing than the simple wish of long ago. Radium had something better than a 'beautiful color': it was spontaneously luminous. And in the somber shed where, in the absence of cupboards, the precious particles in their tiny glass receivers were placed on tables or on shelves nailed to the wall, their phosphorescent bluish outlines gleamed, suspended in the night.... She was to remember forever this evening of glowworms, this magic.

happen—it sometimes becomes easy to forget why one ever got into this business to begin with.

Then, purely by chance, I read the few pages excerpted here.

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