



Scientific Papers

REMARKS IN HONOR OF PROFESSOR SIR HANS KREBS

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I am proud to be able to participate in this delightful venture, but I feel like an imposter, or at least an interloper. For as most of you will know, and those of you that do not ought to know, I started out early in my career as a biochemist, receiving, I think I may say not immodestly, the very best training, but, perhaps regrettably, left that discipline immediately after my training, never to return.

I say that by way of explanation that my memories of Sir Hans cover only a short space of time from the mid- to late 1930's and of the Sheffield Laboratory only, and it is unfortunate that 40 years have dimmed the capacity for total recall.

Perhaps those of you who have only known him since he became an established figure in the biochemical world wonder what he was like in the early days. True, when I first met him he was by no means an unknown figure, having already had the renowned urea cycle to his credit, but he had not yet reached the dizzy heights he was so soon to attain. What then was he like? Here, I would like to refer to a BBC talk Sir Hans gave a few months ago, when he was being questioned about his early days at the Kaiser Wilhelm Institute in the late 1920's and early 1930's, and was asked "What was Warburg like?" His reply came that "Warburg was a martinet." Well, Sir Hans didn't exactly tolerate slackness in those days. Two things come to mind during my very early introduction, when he was explaining my duties. One thing was: ".....and I want you to keep fully abreast of the literature, but if I ever see you in the library, I shall think you are wasting your time." The other was: "The lab starts at 9:00 A.M. and finishes when your experiments finish, but I then want all the results worked out and your next days protocols drawn up. But no matter if you are here until midnight, work starts at 9 o'clock." And if I did get into the lab some morning (not very often, I think I can say) at five past nine, there would be a gimlet eye fixed on me, ostentatiously looking at his wrist watch and the clock on the wall, his gaze following me as I slunk for my lab coat.

That, of course, does not make him a martinet and I am sure he would say, and I certainly would agree with him, that this was just sensible training. No, I think the appropriate word is single-mindedness.

I remember overhearing a conversation between Sir Hands and the Professor of Pharmacology. I should explain in those early days in Sheffield we had no Department of Biochemistry and the lab was housed in the Pharmacology Department. Sir Hans' official position was, if I remember rightly, lecturer in pharmacology. The Professor was suggesting, not unreasonably perhaps, that he wanted some help with the lectures, only to be told with great finality that Sir Hans had more important work to do than lecture to medical students - as indeed we would all agree he had. I

suppose another example of single-mindedness, I recollect, is that he spent his honeymoon at a biochemical conference!

Single-mindedness and high standards. He set himself very high standards, which he was able to keep - but alas, some of us found it impossible. By way of illustration, I recall writing my Ph.D. thesis. As you can imagine, two and a half years work in manometry had produced a list of results to be sorted out, and to use the phrase of another famous man of those days, there were three months of "blood, sweat, and tears" to produce what I thought was a reasonable final draft. In fear and trepidation I took it to the great man, who retired to his cubbyhole of an office to read it. About an hour later he called me into the office with the opening words "Did you write this in a hurry?"

But please don't think life was all seriousness and censure. So let me recall some of the lighter moments that come back to me.

You all know how much work was done in those days on pigeon breast muscle. He had demonstrated to me how easy it was to extract the bird from the cage and cut the necessary tissue slices. And of course, as demonstrated by an expert, it looked quite easy. My first attempt at this was done with a nonchalance that was rudely shattered. I had grossly underestimated the power of those same muscles if the bird was not grasped properly and firmly with the result that on his first attempt it struggled free. Imagine this menace diving like a Stuka bomber, almost impaling itself on some upturned pipettes and scattering bottles of reagents as it swooped down. Fortunately, it soon came to rest on a top window ledge, where Leonard Eggleston, with great presence of mind, gently wound open the skylight and out the bird flew to join its comrades in the quadrangle. Fortunately Sir Hans was out at the time and we had a chance to straighten up the lab before his return. How Leonard managed to cook the books and provide me with another pigeon I shall never know.

Which brings me to my next little anecdote. We wished to try out frog's thigh muscle as a possible alternative high-performance tissue. As the streets round industrial Sheffield did not lend themselves easily to going out and picking up a few frogs, they were ordered from some Middle Eastern country. (The phrase "Iron Curtain Country" had not been invented in those days.) One day a wooden box arrived in the lab that clearly contained the frogs, and I set about jemmying up the lid. Whether I expected in my innocence the frogs to be sitting staring up at with friendly grins on their faces I now don't remember, but I have a vivid recollection, as soon as the lid was off, of about 50 huge frogs launching themselves into space, like miniature Cape Canaveral, with the great man, Leonard, and I chasing them all round to get them back under cover.

My last little story concerns an apparatus we had, crude but effective making gas mixtures, e.g., 5% oxygen in nitrogen. This was simply a couple of cylinders linked together at the bottom with a stout rubber tube and containing a large amount of mercury. Wanting to familiarize myself with it, I went in one Saturday afternoon to play around with it but in the middle of a trial the wire holding the rubber tube broke and about a litre of mercury cascaded over the bench and onto the floor. I spent the next three or four hours trying to retrieve and filter it (it is not called quicksilver for nothing) and finally everything was swept up, cleaned and replaced.

It was only some time later when I went into industry that I learned that mercury at ambient temperatures has sufficient vapor pressure to be extremely toxic and for some time I was haunted by the thought of Sir Hans standing in the lab with the possibility of large globules of mercury under the floorboards. History does not recall whether there was marked improvement in his

health on moving from Sheffield to Oxford but I can now see that my fears for his health on this score were quite unjustified.

I realize if I go wandering on much longer there will be no time for others to give their recollections. So may I just end on a personal note?

In the broadcast I referred to earlier, Sir Hans is asked "What is the use of biochemistry." In trying to answer this rather inane question, he it really depends on who is answering, and mentions that one of colleagues, a President of the Royal College of Physicians of England, once said that "a knowledge of the citric acid cycle was no more important to a physician than a knowledge of Anglo-Saxon would be to an appreciation of Shakespeare." That is a point of view. So to one who left biochemistry for 40 years, it is perhaps worth asking the question "What has biochemistry done for me?" As for a long time I was intimately connected with the large-scale smelting of metals (zinc, lead, cadmium, etc.) and as the most fanatical biochemist would find it hard to find a close parallel between metabolic reactions and the pyrometallurgical reactions occurring in a blast furnace at 1000°C, it is a fair question. My reply would be that it gave me, at an early and impressionable age, the opportunity of working with one of the world's finest minds, to see the speed at which he reached conclusions, to try - and I say this advisedly - to try and understand his thought processes; and it gave me a yardstick to measure greatness in other people I have met in later years. Throughout the years I have occasionally been asked - and it happened about six months ago - "Didn't you once work with Krebs?" and I smile a superior smile and say - "Yes, I did." That is what biochemistry did for me, and for that, Sir Hans, I thank you.