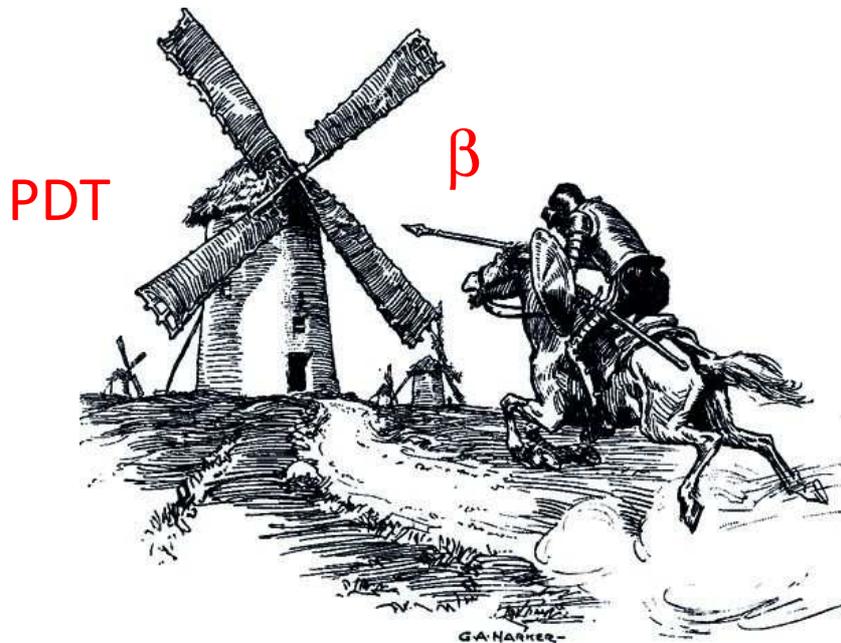


**Mössbauer Effect in Proteins by Young, Frauenfelder and Fenimore PRL(2001), 107, 158102**

Here they are again, the three muske"tiers". They never performed Mössbauer experiments themselves. Frauenfelder, now 90 years old, is still on a mission riding against the PDT. The referees obviously cannot get enough bashing of the bad critic that downgraded their own work.

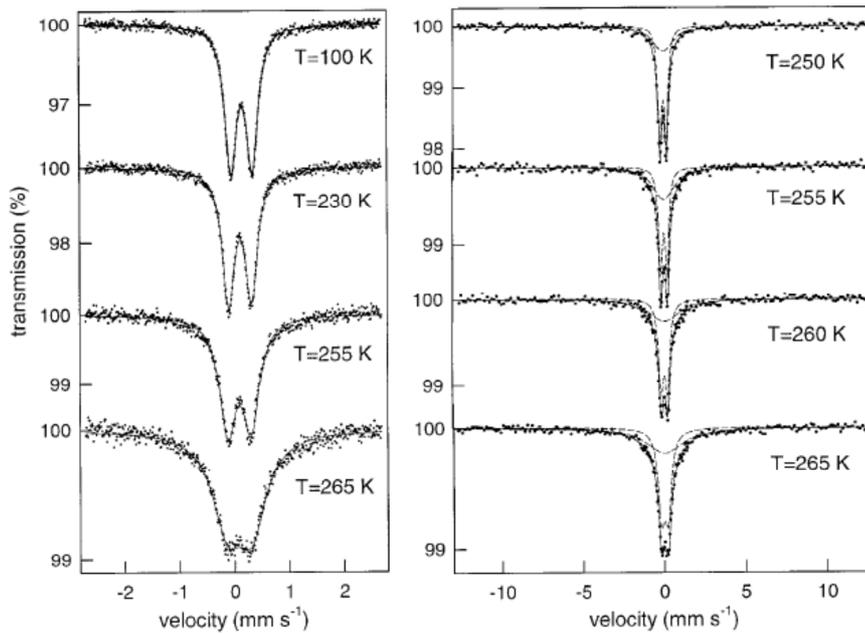


The Mössbauer expert F. Parak, who provided the data, is not even coauthor of this work. It is also striking that a highly relevant paper by Lichtenegger et al. ( Bioph. J. (1999) 76, 414) is not cited. The material looks like a copy: Lichtenegger et al. had shown, that the PDT onset records the solvent relaxation time, which becomes comparable to the nuclear life time:

*“The line broadening **at the onset temperature** reflects diffusive motions that become resolved when the corresponding relaxation times have reached the level of 10 times the nuclear life time, a few microseconds...”*

That’s what they are riding for in this paper.

This result was discussed by us in many publications before, which are not cited: Doster et al. 2005 BBA, Doster et al. BBA 2010 in various solvents, crystal, glycerol-water and sucrose. The spectra, which are displayed here, do not prove much. Check instead Doster et al. PRL (2010) 104, 198101, showing spectra on a log-log scale, not just tiny linear spectra, Frauenfelder should know. He never understood (or was it just polemics) that the spectra for glass transitions are always continuous. Only the second order thermodynamic quantities show a step. He disproves only what was never claimed.



These are Mössbauer data and fits of myoglobin in a glass forming liquid published by Lichtenegger (1999) *Bioph. J.* Do you see a discontinuity? I don't. These data should be compared with fig. 1 of Young et al.

With his view of the PDT Frauenfelder defines what he wants to disprove, which is of course very different from our original and still persisting view (Doster et al. *Nature* 1989). People who cannot read should not publish letters in *Physical Review*. The PDT was from the beginning introduced as two-step process, fast local hydrogen bond motions of water and protein residues combined with collective viscosity dependent structural relaxation. Frauenfelder never referred to the physical concept, which is not dubbed, but is part of modern condensed matter physics. There are two types of well-defined dynamical transitions in the literature: the glass transition and the percolation transition. Its still is disputed, which one applies to hydration water. By contrast "slaving" is a dubbed term. It is even stolen from Hermann Haken, who introduced it to characterize the coupling of fast to slow motions. This concept has nothing to do with the viscosity dependence of rate coefficients.

Since the Mössbauer effect never showed the two-step behavior, it is wrong to say that the PDT was "discovered" with Mössbauer. Any simple molecular process that will be observed with a fixed window method will show such "anharmonic onset." But this is not a PDT as defined by us in relation to a glass transition. The PDT is concerned with viscous structural relaxation of the protein solvent shell on a short time scale in contrast to slow calorimetry. But all PDTs can be observed also with calorimetry at the appropriate time scale (Doster, *BBA* 2010).