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**Thermoluminescence as an experimental tool to investigate the " structure " of
High Dilutions
: Glimpses into the potential role of the gas phase during succussion**

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It has been known for a long time that water, a most simple chemical, shows however many abnormal properties. Most scientists do believe that this is due to the fact that polar water molecules are able to build complex 3-D structures around foreign compounds and between themselves thanks to what has been called " hydrogen bonds ". Generally combined in tetrahedric arrays around a single central molecule, these bonds maintain together large " clusters " or " reference domains " which are specific of their initial history . Another interesting feature is that, though their life-time is only of a few tens of picoseconds and that, accordingly, they do not constitute permanent features, they are able to reconstitute almost continuously within a given identical pattern giving, thus, to the liquid some kind of a statistical " finger-print". This looks to be particularly true for ultra-high dilutions because it is felt that, during the very violent mechanical stirring (succussion), an essential part of their preparation process, the gas phase overlying the liquid is dispersed into trillions of "nano-bubbles" surrounded by successive shells of water molecules which might very well bear the identity of the dilution.

Since water, as an ever moving fluid, is very difficult to observe, we thought that by turning it into a stable solid by low-temperature freezing (in liquid Nitrogen -196°C) the " statistically structured " areas would be converted into corresponding "permanent defects" within the crystalline lattice. These "odd points" could, then, be further "activated" by low-temperature irradiation and become light emission centers during controlled rewarming in a process of thermally activated luminescence . Our experiments, during the last 10 years, did confirm that hypothesis and showed that ultra-high dilutions (even beyond the Avogadro number) could be discriminated between themselves as well as from their dilution fluid, thus giving a credible physical basis to the long-lasting claims of the practitioners of homeopathic remedies.