Although Portland cement has been made into concrete for about 200 years the fundamental structure of cement paste is still not understood. Lack of durability in concrete can be directly related to its ability to transmit water, and, in the USA alone, about a billion dollars per year are spent on replacement of infrastructure. It is considered that some of the gel water in cement paste is very similar to the interlayer water in clays, thus quasi-elastic neutron scattering and neutron spin echo have been used to study these related problems [1-3]. The interpretation of our results on the diffusivity of water in the interlayer in clays and in the pore structure of concrete will be carefully described. Moreover our view on how to improve water transport in the pore structure in cement paste, which could have potential practical benefits, will also be presented.

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References