

Howard J. M. Hanley

The Behavior of Liquids; Milton; Turner



Born in 1937 in Sussex, England. B. Sc. and Ph. D. (1963), University of London. At present: Fellow, National Institute of Standards and Technology (formerly, The National Bureau of Standards), Boulder, Colorado, and Adjoint Professor Chemical Engineering Dept., University of Colorado. Major long term visiting appointments at The Australian National University and the *Institut Max Von Laue — Paul Langevin*, Grenoble, France. Scientific interests include the theory of liquids, computer simulation of the structure of matter, and investigations of atomic and molecular structure by neutron scattering. Author and editor of two books and many scientific articles. Serious hobbies include English literature, and English and European landscape painting of the 18th and 19th century. Address: Thermophysics Division, National Bureau of Standards, 325 Broadway, Boulder, CO 80303, USA.

Within two days of my arrival, the wall was breached. I do not claim the credit but this, and the other extraordinary happenings in Europe, overshadowed the projects that I had in mind. I felt lucky and privileged to be present in Germany for the kind of event that can only occur once or twice in a century. Further, I feel very fortunate to have witnessed the three periods of East and West Berlin; the old days, the euphoric transition period, and now the exciting but somewhat apprehensive reality of unification.

I had work planned for the Wissenschaftskolleg. I wanted to start a book on the behavior of liquids which had been in my mind for two years. Also, I wished to pursue two very serious hobbies, a study of Milton's *Paradise Lost*, and a study of the series of watercolours drawn between 1811 and 1826 by J. M. W Turner for *The Picturesque Views of the Southern Coast*. I considered that the chance to work on these latter topics would not come again. But I was apprehensive that I could combine these apparently diverse topics.

The book is well under way but, ironically, progress was erratic because my regular research on the structure of liquids was successful and had to be pursued. The interaction with my colleagues at the Kolleg who were interested in liquid crystals was a chance I had to accept. I had the opportunity to work with the Theoretical Physics faculty of the Technische Universität Berlin, and I had an unexpected chance to use the neutron facilities at the *Institut Max Von Laue* — *Paul Langevin*, Grenoble.

The research involved investigating the structure of liquid mixtures — that is the local spatial distribution of a mixture component (an atom, a molecule, a segment of a molecule, or group of atoms or molecules) with respect to the other components. We developed an experimental technique to isolate the component and thus can investigate how a particular species behaves in a mixture and contrast this behavior with that of the component as a pure species.

Fluids subjected to a mechanical stress are especially interesting since their flow behavior can then be very exotic. Understanding how liquids behave under these conditions gives a clue to the nature of irreversibility in a physical system in general, and to all the associated difficulties of defining a nonequilibrium state. We pursued this approach. The implication to biological systems will obviously be interesting and relevant.

In short, the research, and several speaking engagements related to it, kept me fully occupied. Thus my regret is that I did not spend more time on the book.

I was pleased with the project on Milton. I wanted to show how the illustrations to the various editions of *Paradise Lost* changed with time, and how the change can be interpreted. To quote the abstract of an article prepared during the stay at the Kolleg; *Paradise Lost* is Milton's conception of Satan's rebellion against God, and his story of the Creation and the Fall of Man. The poem was published in 1667 in ten books. The twelve book version appeared in the year of Milton's death, and the first illustrated edition was published fourteen years later in 1688. Most of the subsequent editions were illustrated. The illustrations to *Paradise Lost* are of the style and fashion of their time, but reflect as well how the poem was regarded and interpreted by contemporaries. How the interpretation evolved can be seen by comparing illustrations from four of the books taken from editions from 1688 to the present day. This task was most pleasant and I benefited to the full in being at the Wissenschaftskolleg. I am most grateful to my colleagues for their encouragement and, in many cases, for their participation of this task.

Finally, I prepared material for the Turner Project. The work entailed visiting the sites of the Turner drawings on the South Coast of England — a

visit carried out between the end of my stay at the Kolleg and my return to the USA. The object was to interpret Turner's artistic licence when he depicted a particular view; also to compare and contrast the sketch, the watercolour, and the final etching that appeared in *The Picturesque Views of the Southern Coast* of 1826.

It was a productive and exciting year. My problem was that I was never sure in my mind whether to work at a set task, or to absorb the atmosphere and allow events to dictate what to do. Overall, perhaps, the part of my stay at the Kolleg that I most enjoyed was the chance to learn from people whose disciplines differed from mine.