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My Interactions with John Lumley on the Subject of Passive Scalars

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In the mid nineteen seventies, John Lumley and others were making rapid progress in the development of second order and other models for the prediction of turbulent flows. It became apparent that experiments on the decay of passive scalars (such as temperature fluctuations) in grid turbulence showed large variations, with important consequences for single scale models. With Lumley, I carried out scalar decay measurements and found dependence of the scalar variance decay rate on the initial scalar length scale. These experiments led to many more on passive scalars, both on their large and small-scale characteristics. Here I describe my interactions with John Lumley during this period, and relate it to the work of other groups. I also show that there are still unresolved problems in this area.