In 1966 when I was an officer in the Coast Survey working out of Woods Hole on the survey ship Whiting, I asked Columbus Iselin, the director of Woods Hole Oceanographic Institution (WHOI), about graduate schools. He recommended that I talk to John Knauss, the new Dean of the Graduate School of Oceanography (GSO) at the University of Rhode Island and an excellent physical oceanographer. My father who happened to be visiting the east coast at the time of my visit to URI joined me and talked through most of my interview with John (to my mortification). At one point John replied to one of my father's questions, "You know, I don't think a graduate degree in oceanography will hurt Phil's career." John later told me that I was the only student who had ever brought along a parent to an interview. Perhaps in spite of this inauspicious start I was eventually accepted to work with John.

After two years at sea in the Coast Survey, I was excited to be at URI. John had hired Mel Stern, Tony Sturges, Dick Lambert and Kern Kenyon who made a lively, interesting group of physical oceanographers. After my undergraduate days at Berkeley, GSO seemed a small friendly place and John became a supportive mentor. For a few years I was the teaching assistant in John's introductory course on physical oceanography that the physicists thought was too simple and the biologists thought impossibly difficult. I dreaded John's travels when I could be stuck trying to explain problem sets and answer tough questions with simple explanations. However, working for John, whom we all referred to as "The Dean," had some great-added benefits. When I needed to get someone to do something I could say, "the Dean would like..." which often got prompt action.

In July 1967 I joined John on his last major research cruise to the Gulf Stream. He had developed a free-fall transport float that we used to directly measure the transport and velocity structure of the Stream in the complicated region where the Stream crosses over or through the southward flowing deep western boundary current near Cape Hatteras, North Carolina. Shortly after deploying the first set of transport floats John instructed his graduate students to maneuver the ship close to the point where the floats would surface after their several-hour-long mission. This forced us into some quick hard figuring since we were then drifting downstream at several knots. Eventually we got it right and often the floats surfaced nearby the ship. By that time he had very effectively melded his motley crew into rather efficient watches that worked well.

John put together a small technical group consisting of Phil Bedard, Bob Sexton and some marine technicians who were responsible for building floats, preparing current meters and moorings. At the time, floats, current meters, releases, and deep sea moorings were in their infancy. It was difficult to make them work correctly and hard to get them back. On the 1967 cruise the transport floats were tracked by HIFIX and worked very well. The current meter results were poor due to release problems, and we could not track the Swallow floats due to weak signals and poor reception using the Trident's directional sonar. Today it is easy to forget how hard it was to obtain good measurements in the 1960s. It was a pleasure working with this group and learning about instruments.

After the cruise John very generously gave me the transport float data to work up as part of my Master's thesis. This initiated me into how freely drifting floats could be used to learn new things about the ocean. I now realize that I have subsequently spent most of my career using floats to measure aspects of the ocean circulation. I have John to thank for turning me into a drifter.

In 1967 physical oceanography was in its early years – the deep western boundary current and energetic deep eddy field of the ocean had only recently been discovered. Gulf Stream rings were known to form but not much was known about them or other ocean eddies. John made some of the very first direct velocity measurements of the transport of the Gulf Stream in deep water and he obtained some of the first moored current meter velocities in the deep western boundary current. In 1969 he published a very nice synthesis of the transport of the Gulf Stream by combining all available transport measurements to show its increase in transport from 30 Sverdrups off Florida to around 150 Sverdrups south of Nova Scotia. The large transport which was five times larger than the estimated wind-driven subtropical gyre transport raised many questions. It has taken a long time to figure out how to explain these observations. The 1960s were an exciting time to be working with John on these scientific issues when new measurements were radically changing our ideas about ocean circulation.

I have many memories of John during my URI days: I remember John apparently sleeping through my first seminar but offering excellent criticism afterward; lively parties John and Lynn hosted for the Office of Naval Research (ONR) site visit team (ONR provided virtually all our funding in those days – John got it from them and doled it out); John and a few other Saunderstowners coming around on Halloween, cups in hand, for a "trick or drink;" and there were John's ineffectual dog memos (see Bob Duce's article in this issue)–his attempts to resolve the conflicts between dog lovers and most of the rest of the community (my German Shepherd followed me to work and was an offender); but most of all I remember starting a career with the help of a great mentor and excellent scientist. I am ever thankful I went to URI to work with John. At the time I knew I was fortunate, and years later I have to admit that a graduate degree from URI did not hurt my career as John had the prescience to realize.

Phil Richardson
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts USA