A Tribute to Jack Wendte

As some of you know, Dr. John C. Wendte passed away last December in Calgary.

During my career, I have been fortunate to be mentored by a number of outstanding geologists, including my thesis advisors, Harold R. Wanless (Master's, at the University of Miami) and James Lee Wilson (Doctorate, at Rice University), and by Noel P. James, when he was a research scientist at the University of Miami. I also include Jack Wendte in that special group.

Jack and I were close friends and colleagues for over 35 years. Jack was a consummate scientist and a great mentor. He loved carbonate geology and was one of the most well-read geologists that I have come across, and it showed in his research.

I want to use this forum to publicly honor his contributions to carbonate geology in general, and to the Devonian/Mississippian of western Canada, in particular. And I would like to share some tidbits about our personal relationship over the years.

First, below are many of his key scientific publications. Hope these help you appreciate the important contributions Jack made to carbonate geology, particularly in Western Canada. If you have not read some of his papers, I encourage you to do so.

1982: Evolution and corresponding porosity distribution of the Judy Creek reef complex, Upper Devonian, central Alberta. Co-authored by Frank Stoakes.
In: Canada's Giant Hydrocarbon Reservoirs, Core Conference Manual. W.G. Cutler (ed.). Canadian Society of Petroleum Geologists, p. 63-84.

This paper documented the distribution of reservoir porosity within a depositional facies and cyclicity framework in the giant Judy Creek oil field, with a primary focus on the tilted eastern side of the complex, where most development drilling occurred.

1990: Devonian Carbonate Sequence Evolution of Western Canada.
Co-authored by P. Wong, I. Muir, J. Weissenberger, M. Gilhooly, F. Stoakes.
AAPG Bull, v. 74 (5), p. 789.

After Jack left Esso Resources for Canadian Hunter, he presented a 1990 AAPG talk in San Francisco, co-authored with several of his former Esso colleagues. It showed the folly of using sea level to predict systems tracts, or, conversely, using systems tracts to predict what sea level did in the past.

1992: Devonian- Early Mississippian Carbonates of the Western Canada Sedimentary Basin: A Sequence Stratigraphic Framework.
Co-authored by Frank Stoakes and Clarence Campbell
(SEPM Short Course No. 28).

This seminal 255-page publication evolved from Wendte's AAPG talk in 1990 and was a culmination of extensive core and outcrop work by Esso Resources Canada and others. A must-read document for anyone working Western Canada carbonates.

1994: Cooking Lake platform evolution and its control on Late Devonian Leduc Reef Inception and Localization, Redwater, Alberta. (Bull. CSPG, v. 42, p. 499-528).

This paper summarizes Jack's doctoral research at UC Santa Cruz under the direction of Bob Garrison, which was long overdue. He fell in love with western Canadian geology while a graduate student, and that love eventually drew him back to Calgary in 1979 to pursue core-based studies with Esso Resources Canada.

1995: Recognition and Significance of an intraformational unconformity in Late Devonian Swan Hills Reef Complexes, Alberta. Co-authored by Iain Muir.
(In: Unconformities and Porosity in Carbonate Strata. D.A. Budd, A.H. Saller, and P.M Harris (eds). American Association of Petroleum Geologists, Memoir 63, p. 259-278).

This paper was an offshoot of the work of Jack and Frank at Judy Creek and Iain at Snipe Lake, both productive isolated reef complexes on the Swan Hills platform. It discusses the problem of using stacking patterns in sequence stratigraphy to predict where subaerial unconformities (i.e., "sequence boundaries") should occur.

1998: High-temperature saline (thermoflux) dolomitization of Devonian Swan Hills platform and bank carbonates, Wild River area, west-central Alberta.
Co-authored by H. Qing, J. Dravis, S. Moore, L. Stasiuk, and G. Ward.
(Bull. Canadian Petroleum Geology, v. 46, p. 210-265).

This paper integrated detailed standard and enhanced petrographic techniques (principally fluorescence microscopy and diffused plane-polarized light) to constrain the interpretation of geochemical data in dolostones. While the "thermoflux" dolomite model explains fluid flow, a more practical outcome of this study was showing that smaller replacive dolomite crystals that exhibit undulose extinctions were also of burial origin, representing a continuum toward the classical high-temperature saddle dolomites. The paper contains lots of thin-section photomicrographs, unusual for a dolostone diagenesis paper.

2005: Sequence stratigraphy and evolution of Middle to Upper Devonian Beaverhill Lake strata, south-central Alberta. Co-authored by Tom Uyeno.
(Bulletin of Canadian Petroleum Geology, v. 52, p. 250-354).

In one of Jack's longest published papers, he delved into the stratigraphic evolution of the Beaverhill Lake Group in Alberta, melding physical stratigraphy with conodont biostratigraphy. They also addressed the interplay between carbonate deposition and a fine-grained siliciclastic sediment influx.

2006: Origin of molds in dolostones formed by the dissolution of calcitic grains: Evidence from the Swan Hills Formation in west-central Alberta and other Devonian formations in Alberta and northeastern British Columbia.
(Bull. Canadian Petroleum Geology, v. 54, p. 91-109).

Iain Muir and I argued with Jack for many years, trying to convince him that Keg River dolostones in the NW Alberta could be leached on a grand scale to create reservoir quality. We half-jokingly thought that Jack wrote this paper to further convince us we were wrong about the Keg River! This paper was groundbreaking for documenting the typical style of porosity evolution in dolostones. Significantly, Jack also explained the evolution of secondary microporosity in limestones that undergo only partial dolomitization, a phenomenon commonly observed in many dolomitic carbonate sequences.

2009: Depositional facies framework, evolution, and reservoir architecture of the Upper Devonian Jean Marie Member (Redknife Formation) in the July Lake area of northeastern British Columbia. Co-authored by D. Sargent, A. Byrnes, and I Al-Aasm.
(Bull. Canadian Petroleum Geology, v. 57, p. 209-250).

This paper nicely documents the distribution of Jean Marie reservoir quality within a core-based depositional facies and cyclicity framework. They noted greater calcite dissolution where the matrix contained higher amounts of replacement dolomites.

All of these examples of his work illustrate the significant contributions he made to carbonate geology, particularly in Western Canada.

A Bit of History Between Wendte and Dravis:

I first met Jack Wendte on December 15, 1977, after a talk I gave on my master's research on Eleuthera Bank in the Bahamas, at a Rice University carbonate symposium organized by James Lee Wilson. Jack worked at Exxon's Production Research lab in Houston ("EPR"). He introduced himself after the symposium ended and then proceeded to pepper me with questions, a characteristic of Jack's that I would come to expect (and very much appreciate) in our later collaborative research and teaching efforts.

The following spring, at Jack's urging, EPR offered me a summer job, but I would have to move to Calgary to work on a Devonian reef project under Jack's guidance. When I reported for work in Houston, Jack informed me that the project had evaporated because Exxon could not obtain a work permit for me. Having nothing to work on, Jack and his colleagues decided I should continue working on my dissertation, a regional study of the Austin Chalk in Texas and northern Mexico, since Exxon was interested in the trend. Those four months were a godsend, as they gave me access to the EPR's analytical facilities, enabling me to complete a year's worth of research and data analysis. Jack was an incredible sounding board, and during this time, I began to appreciate his keen insights into carbonate geology. He knew the in-depth questions to ask, and whether you agreed with him or not, it forced you to be a much better scientist.

In the fall of 1978, EPR offered me permanent employment starting in January of 1979, which I accepted. I then learned that Jack would be transferring to the Esso office in Calgary later that summer to work on modeling (zoning) Devonian reef reservoirs in western Canada, and that I was his "replacement" (a scary thought).

Part of EPR's mission for the corporation was to provide formal training to Exxon's operating affiliates, both domestic and foreign. With little experience, I was thrust into teaching formal in-house and field carbonate courses. Jack was my mentor, along with my colleague and long-time friend, Don Yurewicz. Jack was an excellent teacher who clearly conveyed key concepts, and often he did so humorously in his lectures. In the Spring of 1979, our group of four was asked to teach two overseas carbonate seminars, one in France and one in Venezuela. Harry Mueller and I went to Lagunillas, on the eastern shore of Lake Maracaibo. Jack and Don got the plum assignment (it's called seniority!) – an in-house and field seminar focused on Jurassic carbonates outcropping in the wine region of Bordeaux, along the periphery of the Paris Basin. You know, the typical French field trip with a few hours of work, followed by hours-long lunches with wine. I mention this because Jack came back from France, enamored with a new French name, "Jean Pierre," a name that would surface, literally, in every seminar we later taught together. Sometimes, as the co-teacher, I was referred to as "Jean Pierre," but more often, Jack assigned that name to one of the male participants he chose to make a point with. Out of this trip to France, obviously, came his enhanced appreciation of wine (I recall Châteauneuf-du-Pape being one of his favorites to order).

Jack taught me the ropes for teaching both the Exxon in-house courses and the ancient part of Exxon's 25-day Advanced Carbonate Seminar (Houston lectures; modern carbonates in Florida and the Bahamas; ancient field trips to central and west Texas and New Mexico).

Jack was physically challenged, which limited him in the field, whether snorkeling in the Bahamas or trying to climb outcrops in West Texas or Alberta. But Jack was tough, determined, and always tried to plow through those situations, even if he had to shimmy up the side of an outcrop on his rear end.

When I started at EPR, Jack's research focused on the evolution of porosity in the Upper Jurassic Smackover Formation around the northern rim of the ancestral Gulf of Mexico. He presented a 1979 AAPG talk in Houston with co-author Alan Gensamer entitled "Pore Systems in Jurassic Carbonate Reservoirs, United States Gulf Coast." Proof that their research was seminal: others later replicated much of their work. Given his pending departure for Calgary later that year, Jack spent many hours with me discussing aspects of his research that ultimately led to my opportunity to try to document burial dissolution in Upper Jurassic Haynesville limestones in East Texas, which he thought was more common than industry thought.

When Jack transferred to Calgary, he began working with Frank Stoakes on modeling the stratigraphic architecture of Judy Creek, one of Esso's major Devonian limestone reservoirs. They could do this because of the incredible core database available in Alberta. As noted earlier,

they termed their rock-based approach “Actualistic Sequence Stratigraphy,” using established principles of carbonate geology to build detailed stratigraphic facies models for more effective water flooding or other enhanced recovery efforts. As a result of their work, reserves at Judy Creek were eventually increased from 830 MMBO to 1.1 BBO. Many other limestone reservoirs were successfully modeled by Jack and his colleagues at Esso.

It was around this time that EPR began developing the so-called “Exxonian Sequence Stratigraphy” model. It reflected Peter Vail’s long-held personal belief that eustatic sea-level changes controlled stratal geometries in sedimentary sequences. Mac Jervey, an EPR siliciclastic geologist, wanted to model how siliciclastic stratal architecture would respond to a sinusoidal (wave-like) sea-level rise and fall, rather than the prevailing saw-toothed pattern Exxon published in 1997. But EPR management would not support this research, so Mac pursued it on his own time. He did the modeling, published his research report internally at EPR, and then transferred to Esso Resources in Calgary, where he became the supervisor of Jack’s and Frank’s modeling efforts.

Eventually, Vail and his group of seismic stratigraphers latched onto Mac’s report, and it became the foundation for Exxonian Sequence Stratigraphy. Interestingly, Mac cautioned in his study that the idea of a sinusoidal sea-level curve was purely hypothetical and needed to be tested rather than rubber-stamped onto a database. But Vail and his subordinates went even further and treated carbonates and siliciclastics as responding the same way to these hypothetical sinusoidal sea level changes. As you can imagine, it generated considerable controversy within EPR and among Exxon affiliates, including Esso Resources Canada.

Jack and many of his Esso colleagues were outspoken about this new EPR model and the “revised” interpretations that were emerging with the application of this conceptual model. Jack viewed this ideological approach with disdain; people were now taking a hypothetical model, with its confusing lingo, plastering it onto a database, and calling the results a newly established relationship. Jack described EPR sequence stratigraphers as “parachuting into” the Esso office in Calgary, revising established stratigraphic relationships using the model, and then “parachuting out.” This process required no support from rock data - just apply the model. This led to several internal meetings between EPR and Esso, but they failed to resolve the differences. Vail had the support of EPR’s top management, and it became highly political. The bottom line: Jack was not afraid to push back on this type of corporate shenanigans. He always backed up his criticisms with rock-based observations. I admired that trait and strength of character in Jack. After Jack left Esso Resources to work at Canadian Hunter, he presented the 1990 AAPG talk in San Francisco I referred to earlier. It was one of the best talks I have ever heard at a professional meeting – a logical and direct refutation of Exxonian Sequence Stratigraphy. It was based on 50 man-years of studying Devonian outcrops and subsurface reservoirs, letting the rocks tell the story!

Jack was not only my mentor at EPR, but his counseling continued after I left EPR. In 1987, Jack gave me my first teaching gig as a consultant by bringing me in to teach part of an Esso in-house seminar. Later, I twice took Esso to Caicos Platform in the southern Bahamas and then did both an in-house and a Caicos seminar for Canadian Hunter after Jack joined them. We last formally taught a 2002 CSPG seminar called "Comparison of Upper Devonian Cairn Dolostones, Canmore, Alberta, and Middle Cambrian Hydrothermal Dolostones, Field, British Columbia." A 3-day seminar of lectures, a core workshop, and an all-day field trip. I think it was one of the best seminars. As part of these teaching interactions, I benefited immeasurably from his extensive experience working Devonian and Mississippian carbonates, including the many days I viewed cores with him, either formally or informally, as part of our prepping for these seminars.

There was no better mentor than Jack! Jack loved geology and lived it to its fullest. After I left EPR and became a consultant, Jack and I kept in touch by phone at least every few weeks for the next 25 years. In my early years as a consultant, Jack graciously put me up in his house and almost always drove me to the airport. Jack loved to fish for salmon near Vancouver, and I got to eat many tins of his canned salmon over the years. Jack was always so very generous. I tried to repay him whenever he visited my home in Houston. The most memorable and intense visit was a week-long trip in 1997 when he was working with the Geological Survey. We literally spent most days and nights examining and photographing numerous thin sections in my office to establish a diagenetic framework that would constrain the subsequent geochemistry of the Swan Hills carbonates for our 1998 CSPG paper on "Thermoflux dolomitization." In the end, it was worth the time spent. Along with the prerequisite outings to Houston restaurants. Whenever Jack was in Houston, we would go to an Astros game or a college baseball game at Rice University. Many of Jack's colleagues have noted his love of baseball and his support of minor league teams in Calgary, several of which I got to attend with Jack over the years. His love of baseball extended to attending spring training games in Arizona just about every year. He always told me that there was nothing better in life than to watch a Spring Training game with a glass of wine!

The last time I saw Jack was for dinner in 2013, when I was in Calgary to teach a seminar. Sadly, after that encounter, I never saw him again. He stopped communicating and disappeared socially.

I was very lucky to meet Jack Wendte and work with him for decades. He made a positive impact on my life and career, for which I will always be grateful. He will be missed but never forgotten. Thank you, Jack.