Thursday, March 16, 2006

Petroleum Club • 800 Bell (downtown)
Social 11:30 a.m., Lunch 11:45 a.m.

Register online, call, fax or e-mail your reservation to Mrs. B.K. Buongiorno at Tel: 713-651-1639, Fax: 713-951-9659, e-mail: bkspee@aol.com by 12:00 Noon, Tuesday Jan 17, 2005. **Members and Affiliates who register by Jan 17 pay $30. The cost is $35 for guests, non-members, and new registrations at the door.** No-shows will be billed. You can now sign up for SIPES Meetings online at www.sipeshouston.org, but payment is still required by regular mail or at the door.

SIPES Luncheon Meeting

*by **J. Bee Bednar***
Panorama Technologies Inc.

Migration Without the Math: Did the Greeks Really Know All This?

Forming a subsurface image from recorded seismic data has truly become a mathematical physicist's delight. Today, virtually every seismic imaging module is based on someone's favorite very complex coupled first-order or second-order partial-differential equation or equations. To the not-so-mathematically inclined, the algorithmic hierarchy is a bewildering diagram of confusing labels, terminology and, worse, complicated underlying explanations.

Therefore, it might be surprising to current practitioners of the art to learn that this was not always the case. Seismic imaging has progressed from some simple geometric principles (things the Greeks were well aware of) to the more complex formulations we understand today. The reason this was possible is that the same principles underlie today's complex equations some of us seem to love. It seems reasonable to decide that if the simple concepts worked well in the past, they might be sufficient to explain the more complicated approach of the modern era.

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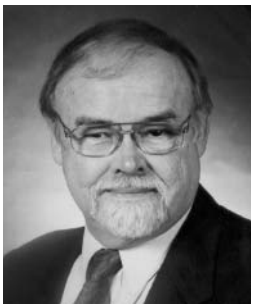
What I try to do in this short presentation is use this approach to generate some insight into what we do today along with what works, why we need it and why it sometime is not as successful as we would like. I end with a recipe for what seismic imagers will be trying to do in the future, and explain why computers have become such an integral part of the search for subsurface hydrocarbons. Along the way I hope to at least attempt to shed some light on available algorithms, how acquisition affects output results why some algorithms are very sensitive to incorrect velocities, as well as how we usually get the velocities in the first place. However, I promise not to use any equations more complex than what your favorite Greek might put in a Trojan horse. ■



Biographical Sketch

After receiving a PhD in mathematics from the University of Texas at Austin, J. Bee Bednar did research in anti-submarine warfare and taught mathematics at Drexel University and the University of Tulsa. Bee was Manager of Seismic Research at Cities Service Company and later became Manager and then Director of Geophysical Sciences at Amerada Hess, where he was instrumental in development of distributed seismic processing software and led Amerada to the forefront of prestack depth imaging and computer-assisted interpretation. He has participated in over 100 prestack depth imaging and interpretation projects and has published over 75 papers in mathematics, electrical engineering, geophysics and computer science. After retiring from Amerada Hess he became Vice President of Research and Development at Advanced Data Solutions, where he was instrumental in introducing LINUX-based cluster computers to the energy industry. He founded 3dBee Tech in 1997 to do consulting and geophysical software development. Bee is currently one of the founders of Panorama Technologies Inc, where he is Senior Executive Vice President. He still consults for companies engaged in the exploration for and production of hydrocarbons and manages development of geophysical software on modern cluster computers.