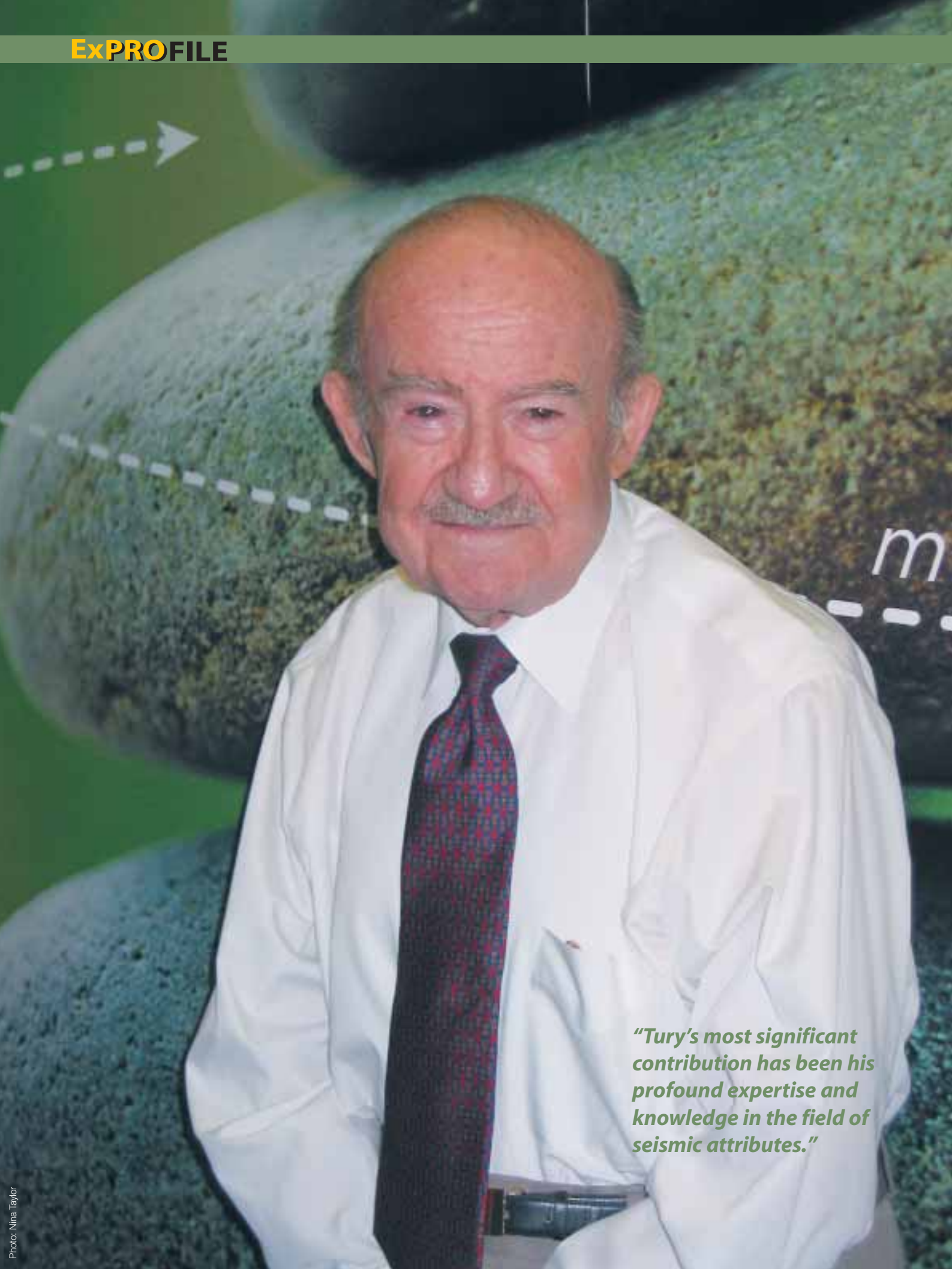

*"Tury's most significant contribution has been his profound expertise and knowledge in the field of seismic attributes."*

Photo: Nina Taylor

# A lucky switch benefits the seismic industry

**By his own admission, prominent geophysicist Dr. M. Turhan Taner, known throughout the industry for his expertise in seismic attributes and seismic velocity computation, entered the field of geophysics by mistake, albeit a lucky one.**

*Nina Taylor*

Armed with a section of seismic data he had no clue about, Dr. M. Turhan Taner along with Dr. Fulton Koehler, extracted a geophysical signal by utilizing sine and cosine functions as filters, which resulted in a contract offer from geophysicist Dr. Burton McCullum; Dr. Taner was elated.

"We had a $10,000 a month research contract. In those days if we had a $1,000 worth of jobs we would open a champagne bottle."

## Fast Reader

Born in Akhisar, Turkey, Dr. Taner moved to Istanbul while in the fourth grade, completing a master's degree in structural engineering at the Technical University of Istanbul in 1950. During his college years and while accompanying his topographer father during fieldwork for the Turkish government, geophysics never entered his mind.

Arriving in the United Stated in 1953 to pursue a doctorate at the University of Minnesota, Dr. Taner employed computers for his engineering calculations and in 1959 co-founded Scientific Computers with his former mathematics professor, Dr. Koehler.

He relocated to Houston, Texas in 1962 to open a branch office, and at the recommendation of his friend Jim McGregor paid a visit to Dr. McCullum to offer the company's computer problem solving services.

Dr. M. Turhan Taner, who will be 80 next year, has spent more than half of his life innovating seismic techniques.

"I went to see him; he was about 73 years old, and he was just having fun researching geophysics. At the time I had no idea what in the world I was talking about, and Dr. McCullum looked at me and said, 'what do you know about geophysics?' I said nothing sir. 'Oh, he said, that's good; we know where we start from then.'"

Dr. Taner devoured every book about geophysics, 'reading them a 100 miles an hour,' the result of doctor-prescribed pills for weight reduction, which turned out to be amphetamines.

With Dr. McCollum's advice and support and Dr. Koehler's collaboration, he began creating geophysical processes on the computer.

## Time To Move On

In 1964, Dr. Taner launched a new enterprise with Scott Kelso and Dr. Koehler named Seiscom Computing Corporation, serving as chairman and senior vice president director of research. He became chairman emeritus in 1973 to allow him to focus on research, including the development of seismic attributes, which was originated by Nigel Anstey of their London office. He procured a contract from AGIP for further innovation and in 1990 established The Seismic Attribute Consortium comprising 25 companies that endured 14 years.

Dr. Taner moved on once again and in 1980, and at the request of several clients for his consulting services, established Seismic Research Corporation.

"I went and got myself five folders, because I was going to give them 20 percent of my time. After I filled up the folders I got one more client, so I ended up selling 120 percent of myself, developing all kinds of seismic processing methodologies for these companies."

In 1998 Dr. Taner merged his Seismic Research Corporation with Petrosoft of California and Discovery Bay of Houston to form Rock Solid Images, a unique service company that combines geophysical, rock physics and computer technologies for seismic reservoir characterization.

## The Changing Industry

During his lengthy career Dr. Taner has experienced great strides in the seismic acquisition and processing industry, especially with the introduction of computers.

"The big jump was the digital revolution when they went from analogue to digital in the sixties, and with color graphics attributes all of a sudden became useful in the late eighties."

He believes that because petroleum is now more difficult to unearth, and industry competition is becoming tighter, development must constantly move forward in order for service companies to stay competitive.

"Many giants have been found; now we're going to be looking at smaller reservoirs, and that means the exploration business has to be more refined from the technology side, acquisition side and interpretation side. It's like anything else in science; we'll be getting more and more into the specific."

Currently, one of Dr. Taner's pet projects includes developing methods for fracture detection and permeability in the carbonate environment such as that found in the Middle East, for which he and Evgeny Landa, research professor at the University of Pau in France, acquired a patent in 2005.

"We're looking for permeability; unfortunately right now we don't know how to

measure permeability with the seismic data but maybe in the future. It is one of those things that rock physicists and us are cooperating. If we're able to map those we'll be quite a bit ahead of everybody else, and then they're going to catch up with us, and we'll get into something else. It's been that way all my life in geophysics."

In August 2006, Dr. Taner and Evgeny Landa were awarded another patent for a novel method of detecting earth formation fractures by seismic imaging of diffractors.

Another subject Dr. Taner finds fascinating is neural networks, the creation of artificial intelligence by allowing computers to think and make decisions, and he has developed several supervised and unsupervised neural network modules for reservoir characterization.

Although striving to discover new answers to geophysical questions, Dr. Taner finds himself returning to old information, because he believes earlier papers did not benefit from the computer age and 'what was impossible yesterday is just child's play today.'

"Looking back they did have a little bit different point of view on the problem. For example when you're doing some kind of process like filter design you may think there is nothing else to do. When you think there is nothing else to do, it's time to start anew, with a different way, because knowledge doesn't end."

## The Birth Of Seismic Velocity Analysis

Besides developing seismic attributes, Dr. Taner has produced widely recognized work concerning seismic velocity computation in collaboration with Dr. Koehler.

"We were working on measuring similarity between traces, later called semblance, Dr. Koehler and I. While we were talking about this velocity analysis, all of a sudden it dawned on us that we could scan the data and compute the semblance, and whenever the semblance is maximum, there is the velocity. That Friday afternoon we were talking, and I stayed, and by Sunday afternoon I had the first velocity analysis on the computer."

Taner said he performed eleven velocity analyses on one seismic line instead of using the standard single velocity function for the entire project that was consistent with Gulf Coast seismic processing practice.

"You should have seen the difference between that and what we were doing standard; it's astounding. Everything was crystal clear. I didn't get a patent; it was very funny. I gave a paper, and after my paper there were three oil companies that came out with three different patents on the velocity analysis. I gave the paper freely for everybody to use."

## Sharing The Knowledge

Dr. Taner's views concerning the sharing of knowledge has allowed the industry to benefit from his many accomplishments: "When we find a new formula or a solution of a problem we call it discovery. Discovery means the solution existed, but we didn't know it was there, and anybody could have thought about it. I feel knowledge belongs to everyone, and for that reason I don't mind sharing what I know."

During his more than four decades in geophysics, Dr. Taner has contributed numerous chapters in geophysical books and co-authored papers on a wide variety of topics. He has also lectured extensively for the AAPG and served as continuing education lecturer for the SEG since 1972. He was inducted as an honorary member of the EAGE at their 1999 meeting in Helsinki and given honorary membership in the Society of Exploration Geophysics for his significant contribution to geophysics in 1978.

*"When you think there is nothing else to do, it's time to start anew, with a different way, because knowledge doesn't end."*

The European Association of Geoscientists and Engineers (EAGE) recognized his lifetime achievements by presenting Dr. Taner with the esteemed Erasmus Medal in Paris in 2004, and he received the Maurice Ewing Gold Medal from the Society of Exploration Geophysics for his scientific contributions in 1993.

Dr. Taner continues to lecture during his travels as he did this May in Pisa and at his former university in Istanbul. He finds it rather humorous that although he graduated from the civil engineering faculty, he conducts his lectures for the geophysical faculty. In 1991 the Technical University of Istanbul awarded Dr. Taner an honorary doctorate for his contributions to geophysics and geophysical education in Turkey.

## A Time For Travel

Although Dr. Taner feels deeply for his native Turkey, where he often returns to lecture and reunite with family, he finds the cuisine and countryside of Italy irresistible. His appreciation of great masters such as Vincent van Gogh, Monet and Renoir have inspired him to reproduce numerous art works that adorn the walls of his home and office. He is also an accomplished musician and has played jazz guitar with a band on Turkish radio and in Amsterdam after an EAGE annual conference.

"Though Tury is a scientist, I think he'd prefer to be recognized as an artist. He has a great love of all things culinary, especially super-Tuscans to complement. He's an accomplished painter and musician and is equally at home with a FORTRAN program or a music score," said president of Rock Solid Images, Richard Cooper.

Dr. Taner is the father of a daughter, two sons, and a grandfather of four. His eldest son, Jeff Taner, who has worked with his father for twenty years, commencing at Seismic Research Corporation, now serves as manager of IT at Rock Solid Images.

Richard Cooper, who has always found Dr. Taner gracious, approachable and extremely knowledgeable, sums up his career in the field of exploration geophysics: "He has made contributions in diverse areas such as deconvolution, imaging, velocity analysis, refraction statics, seismic attributes and neural networks. Tury's most significant contribution has been his profound expertise and knowledge in the field of seismic attributes. He has continued to refine the work he began at Seismic Research Corporation. Most recently, he has developed a number of novel methods for attenuation or "Q" analysis and compensation, resulting in the issuance of several patents, and commercial software and service products."

Dr. Taner confessed he is elated he made the move from engineering to geophysics and harbors no regrets. He recalled his surprise when in 1962, Dr. Burton McCullum awarded Scientific Computers its first contract.

"I thought there must be something good about this; well, that was the beginning."