insisted. "On that wall, roof control consisted of frames made up of two pairs of two-legged hydraulic props in tandem open at the back. One operator was required for a set of frames. Today, two to three operators run an entire longwall—huge longwalls compared to the early ones—and it could be done with fewer than that if they would let us."

According to Syd, those early longwall panels were only 300 to 400 ft wide, and seldom exceeded 3,000 ft long. "Today," he said, "panel faces normally are greater than 800-900 ft—to a maximum of 1,500 ft wide—and 10,000 ft long, or longer, with the largest now being 18,000 ft in Illinois and Colorado.

"What has made this possible are the shields used today, and those Consol did introduce to the industry at its Northern West Virginia Shoemaker Mine in 1975," he said. "In 1986, we had undertaken a research project to evaluate various types of shields for U.S. Steel at its Cumberland Mine, just across the West Virginia-Pennsylvania border. Three years we worked on that. When we started, Cumberland was producing 1200 tons per shift. When we were done, they were at 3,000 tps. After we presented our paper on the superiority of two-legged shields from that project, those were the only supports the industry ordered from there on out.

"In my opinion, that—those shields—was the first major improvement made in longwall mining since its introduction to America, and that’s what caused the industry to be more receptive to longwall mining. By the mid-1990s, other forms of longwall roof supports completely disappeared.

"Back in the 70s," Syd recalled, "there were those who took pleasure in derisively saying we had ‘imported’ this technology, but look how long it took us to become the leader in longwall mining worldwide—15 years to become the best in the world. I tell everyone I can every chance I get, this innovative, can-do spirit is what makes this country so great, and coal people are at the front of it."

Eastern, Dr. Peng noted, always had been a very progressive company. "In 1975 or so, I was involved in a Bureau of Mines research project at Eastern’s Federal No. 2 Mine, not far from here in Morgantown. I had joined the Bureau at its Twin Cities Research Center in St. Paul, MN, after receiving my PhD from Stanford in 1970, leaving the Bureau four years later to join WVU. But back to Federal No. 2.

"There we were attempting to apply tunnel boring technology to drive an 18-ft diameter tunnel in lieu of the conventional multiple main entries. That project, being the first of its kind, and on which my first two Master Degree students worked, encountered many technical and legal difficulties, in large part because Federal No. 2 was a very gassy mine. Five years ago, I had occasion to be back into that part of the mine, and then it still was no gas—the possibility being that the tunnel might have de-gassed the highly gassy reserve during that time. I tell my students today, if we could have maintained that funding, we might have developed advanced technologies to possible could have prevented two of the industry’s recent accidents; the dismantling of the Bureau of Mines indeed was a terrible, terrible mistake.

"When the Sago Mine disaster occurred in West Virginia (January 2, 2006)," Syd recounted, "I received a telephone call asking me to speak on-air to Bill O’Reilly of Fox Network News. I wouldn’t do it; I was so mad at how I sensed they wanted to portray us, the industry. Why, with electro-hydraulics in 1984, the longwall at Consol’s Loveridge Mine was computer controlled at the time PCs barely had made their debut, and they wanted to call us backwards.

"Crandall Canyon (Utah, August 6, 2007) was even worse," Syd continued unabated. "I remember it was a Monday, about 4 o’clock in the afternoon, and I got a call from a New York Times editor who wanted me to explain longwall mining. ‘What about it?’ I asked. ‘There’s been a mine collapse,’ the caller said. ‘Where?’ ‘About 5 a.m. in Utah.’ ‘Utah where?’ ‘Price, Utah.’ ‘What mine?’ ‘That’s not that important...’ Right away I knew it most likely was a Murray Energy Mine as they just recently had purchased three mines in that area.

"At 11 o’clock that night, he called again. ‘Dr. Peng, it doesn’t involve longwall mining but room and pillar extraction, we want you to talk about room and pillar extraction.’ Then I got real quiet, I didn’t want to get into that, but they did quote me, and fairly accurately. I told them (The Times) the first time when I explained longwall mining, there was one condition, let me review what was written and quoted, and they did. They were general comments, how a longwall works; nothing technical, very general information. A week and half later, upon returning from Australia, I found 20 messages waiting for me from lawyers..."
representing different parties, TV and newspaper reporters and radio announcers from all over the country.

"I remember in 1982 when I offered the first longwall short course at SME (Society of Engineers) Annual Meeting, Bob Murray was one of my first students," Syd recalled. "I said to him: 'You're president of North American Coal, what are you doing here?' He replied: 'Well, we're getting into longwall mining and I want to know something about it.' Bob, who subsequently sent his three sons to go through our program, is a close personal friend to this day. I often wished as a mining engineer that I could have done what he has done: he started with nothing and he built an empire, providing jobs for more than 3,000 coal miners."

Which, to some, Syd has done, though his empire is not counted in mines he owns but rather in mines he has helped, having been involved in coal and hard rock ground control and other problems in more than 240 U.S. mines and 65 mines in 16 foreign countries, and in mining engineers, having personally supervised 36 PhD and 44 Master of Science students, along with hundreds of undergraduate students. "Over the last 30 years," he pointed out, "our program has been a major producer of advanced degrees, averaging two PhD and three Master Degree graduates every year."

While chairman of the department, Dr. Peng diligently attended all the University's official functions, as he put it, "getting to know people and getting people to know me. Our social life," he added, "is much more private now." But his professional life is no less active.

"One of the pleasures of this phase of my life is having more time to think," Syd offered. "Now, instead of being an administrator I'm a researcher-teacher-consultant. The three need to be all mixed together. In research, Dr. Peng has received 11 national and international awards for his research accomplishments, including election to the National Academy of Engineering, the first ever from WVU in its 145 year history and just the fourth person from the State of West Virginia.) I find something new or improved and give that to my students and, in the mechanics of that, serve the industry.

"One semester," he continued, "I teach senior year undergraduates and one semester graduate course; in the spring it's Longwall, two days a week. In the fall it's Advanced Ground Control, three days a week. When not in the classroom, there typically are three or four research projects underway. If the industry asks me to do something, and if I can do it myself, I undertake it as a consultant. If I need graduate student involvement, then the project is undertaken through the University," Syd explained.

"I think the students appreciate that this way they always have the latest knowledge of what is going on in the industry," he continued. "Additionally, most of my students work the summers, either with a coal company or an equipment manufacturer or supplier to the industry. Those in my longwall class always have a lot of questions when they come back, and I can answer those questions because, through research and consulting, I have the latest knowledge."

That knowledge has translated into four books authored by Dr.
Peng: Coal Mine Ground Control, 3rd Edition (2008); Longwall Mining 2nd Edition (2006); Ground Control Failures, a Peng-photographed pictorial view of case studies (2007), and Surface Subsidence Engineering 1st Edition (1992), which is to be revised this year. In addition to West Virginia University, Dr. Peng's books are in use at the University of Kentucky, University of Pittsburgh, and Penn-State Fayette.

"I published the books myself," Syd noted. "Working with a local printer in Morgantown, we annually publish The International Ground Control Conference proceedings. I thought, 'If we can print that, why not a book?' Now I hire an editor to fine-tune the prose and ask graduate students to help with figures and formatting.

"Marketing the books has not been a problem," he said. "I'm not bragging, but I am well-known in the industry; the market is not that big, and I know where the books are needed, so I don't need a publishing house and that additional overhead. I do it myself."

These four are not Dr. Peng's first literary efforts. "As a young man in China I was a fiction writer of sorts, but not now, though I did get some questions about that at the 50th reunion. I wrote mostly about kung-fu characters, the Chinese equivalent to the American Wild West. In China, volumes upon volumes are written about kung-fu characters. As a boy, as soon as you opened a book, you wanted to finish it so you could open the next volume. You didn't sleep. These were our super heroes who could fly, run like a speeding sports car, jump buildings, do just about anything, or anything you wanted them to do.

"To tell you the truth," he admitted, "I can't remember if I wrote about one continuing character or if I had new characters each time; they were just short stories and it was a very long time ago. Perhaps when I retire..."

"That," he said, "will be next year some time, maybe. But, when I say retirement, I just mean slow down.

I see a lot of friends retire and completely stop, and that's really not healthy. I am looking forward to more traveling, but leisure traveling. Among my many students, there are two factions giving me advice. One saying you should not retire because it would be the waste of a great mind, the other saying you have done enough, take your well-deserved retirement. Students counsel their teacher.

"To me, no matter how old, how successful they have become, they always remain 'my students',' Syd offered. "Many of them are Chinese students and understand, they were raised that way, to have respect for their teacher, accepting your teacher as your role model.

"I am lucky," he continued. "My former students are very supportive of me, of what I do, and they stay in touch. One student from 1985, now on the West Coast, still calls periodically and asks how I am doing, how I feel. Others, though living abroad, do the same through e-mails. Even my best friends right now are former students. What I think I'm lucky in is that many of my students I selected personally. I've been blessed in that there are a lot of things in which I am involved that they can help me with, as well as a lot of things I want to do, even after I retire."
Dr. Syd Peng

“The first floor,” Syd continued, “would be for a well and livestock and the second for food storage. The upper levels were divided into living quarters and as many as 400 families would live in one building, with several buildings clustered together. Some of the remaining sites are big tourism spots today, with people still living there, old people like us; young people move to the city. We’re talking very remote areas in South China and, back in the 1970s, as one of our spy satellites was orbiting over China, observers thought the buildings were missile silos. It seemed quite a stir.

"But I digress, back to Taiwan and my years of study in junior high school. Back then, the geography teachers told us that China, not Taiwan, is a big country, rich in mineral resources but with little exploration. At that time, I, all the people in Taiwan, believed we were the legitimate China. It was not until I came here to America that I realized Taiwan was not really China. Chan Kai-shek told us Taiwan was one of 35 provinces of the Republic of China and that one day we would take over all of China.

“Everything in Taiwan was controlled by the Nationalists, all communications, and we were not told the whole truth. If I had not come here to America and had not been exposed to free speech, to the freedoms here, no doubt I would have been perfectly satisfied living that way. However, after 45 years, I realize in no way could I now get used to it.

“I used to go back to China very often,” Syd said, “up to 1998, while my parents still were alive, then for six years I did not until the last four years when again I returned, in particular to my alma mater, Taipei Institute of Technology. I began to think back very fondly, that after more than four decades, now I should help them (China) out, both Taiwan as well as Mainland China—the People’s Republic of China. Now every year I go back and help at two universities—Henan—pronounced ‘Hou-nan’, meaning ‘south of the river’, which would be the Yellow River, China’s second major river after the Yangtze River—Polytechnic University and Taipei University of Technology, my alma mater, working with both mining engineering colleges and mineral resources institute. I also work with the governments and the mining industries.

“Mining in Taiwan is minimal,” Syd explained, “mostly construction materials, a few minerals, but no longer for coal. Upon graduation, I went to work for the Coal Mine Administration at the Sinchu Coal Mine. Coal had been mined in Taiwan for more than 100 years, with production peaking at 5 million metric tons in 1965, but then declining steadily thereafter. The beginning of the end though came in 1982 when there were three major coal mine disasters, and by 2000 a mere 83,000 tons of coal was being mined. The following year the government closed the last of the coal mines. Mining engineers, actually called mineral resource engineers, still are trained in Taiwan, but then they go to different countries in Southeast Asia, primarily Indonesia and Philippines.

“As a result, my work in China and Taiwan now mainly is in helping to develop the faculties and train graduate students at both the universities I mentioned, along with working on some research projects and with China coal companies developing mines. In China, there no longer is a Ministry of Coal Industry overseeing the coal industry; the industry was privatized in 1996-97 and the Ministry was dissolved,” Syd explained.

“Prior to that,” he continued, “there were some 2,000 people employed under that system in Beijing alone. After some discussions with friends in the former Ministry, I wrote a letter to the then Prime Minister, Shu Rongji and asked, why not do like the United States and establish an MSHA (Mine Safety and Health Administration), putting all mining regulations in one place that will be safety oriented? Don’t,” I wrote, “just lay off 2,000 people; form an MSHA organization. Which is what they did, calling it the State Administration of Work Safety.

“In doing so, the former Minister of Coal was put over the organization, and the first thing they had the Administration do? Work on the investigation of some sort of ship disaster; they don’t have an OSHA group and the Administrator was put over the investigation. Now, after 10 years, the agency has expanded to cover all other industries, with coal now being but a part of the group within that equation.
Have they had any success?" Syd posed. "Well, the official number of annual fatalities in coal mining used to be 10,000. I believe the official number today is 4,000. They have made tremendous progress under the new system. One of the major problems still remaining in their coal mine safety, however, is that they have too many small mines equivalent to our mom-and-pop operations that aren't even on the map.

"I'll be going to China and Taiwan for a period of time. I'll be lecturing and visiting mines in and around Jiaozuo in Henan/Shaanxi Province in Central China, 14 hours by train from Beijing but one hour by air," Syd offered. "You wouldn't think language would be a problem for me but Hakka is but one dialect, and I found I couldn't even speak that when I first returned to Taiwan. After a week or two, I could hear it and understand it, but I still couldn't speak it to be understood."

Of Syd's two brothers and four sisters, none are in this country. "In 1979, I did bring my parents here for a visit," Syd recalled. "After two weeks, my father had had enough and told me, 'I'm going home, there's nobody to talk to here.' In turn, I took my sons there several times when they were young kids but, once they grew up, they didn't want to go back. I guess they had no one to talk to either.

"Neither Chinese nor English are easy languages," Syd observed. "When I was asked to write an article about my professional life for my university class's 50th Reunion last year, they wanted me to write it in Chinese, to which I said, 'No way'; I had to have a Chinese graduate student here translate it for me," he said.

"America is my second home, but I really grew up here, and most of that was in West Virginia," he continued. "I was 20 years old when I came to America. As the oldest of seven brothers and sisters, my parents wanted me to marry and provide them with grandchildren, therefore they would have preferred I remained in Taiwan and got married there. Marriage, however, waited until I returned to school for my PhD in California."

For Syd, it was a case of being half way around the world to "re-meet" the girl who would be his wife. "We had attended the same university but, even though we both were from Taiwan, we spoke different dialects. Besides," Syd recalled, "there were very few girls in engineering schools back and Felicia, who was majoring in textile engineering, was very active, very popular, so I knew her, at least by name, but she didn't know me. We met again in America, at Stanford University. There were other Chinese students there and we would have socials, which is where we really met. When Felicia had graduated Taipe Institute of Technology she went to Japan to study, eventually changing her major to chemical engineering; her parents, older brothers, and sisters all were Japanese educated."

Felicia and Syd have two sons. "Our elder son Stanford, continue
Dr. Syd Peng

In a Brazilian coal mine. The shrine is believed to protect the miners who stop by to pray on their way to the working faces. Peng, third from left.

Mine tour with undergraduates. Peng, far left.

appropriately named after our beloved Stanford University, also attended there, completing two degrees in three years and then continuing on to Yale University to obtain both his MD and PhD in six years. Today he is a rheumatologist specializing in immunization and lupus with his medical practice in Seattle, my daughter-in-law's home town," Syd related.

"I still try to convince him he should study old Chinese herbal medicine, but he doesn't believe me. When I was a child and would become ill with a fever, my mother would go out to the paddy field that had walkways through it where herbs would grow. With these, my mother would cook a very bitter soup, very difficult to drink but very effective, and with no side effects. I've tried to convince my son to go to China to study, to broaden his knowledge with herbal medicines, but I have yet to change his mind.

"Our younger son, Wildon, completed his MS in chemical engineering from Southern California University and currently is taking a leave of absence from his PhD studies at Ohio State University in Columbus. While I had allowed my older son to do what he wanted, I did try to guide his brother," Syd said. "Now both sons graduated Morgantown High School. When I tried to talk to the younger son about mining, he said, 'Oh, you're talking about the industry that is making our environment a mess.' That's when I said to myself, 'Boy, do we have a problem as a profession.' I couldn't convince him to take up mining engineering, but being close to his mother, he has taken her field of study; his mother teaches here in this department, coal preparation and computer application to mining engineering.

"At least now Wildon doesn't say that about mining any more, I have had some success there. At the outset, he had had the same misconceptions of mining, and coal mining in particular, as does most of the general public. That's why, wherever I have gone recruiting students at high schools in West Virginia and surrounding states I always emphasize coal, trying to explain that it is not what they think. Apparently some of them listened, 90-95 percent of our graduate students typically have gone into coal mining. Today, there are 90 undergraduate and 20 graduate students enrolled in the WVU mining engineering program.

"The last three years, since I stepped down as Department Chairman, I haven't been doing student recruiting," Syd continued. "During the 1985-2005 period, as with all nation's mining schools, there were not that many graduate students in our program. However, every year, I was able to get all of those wanting one a summer job in the coal industry, primarily to keep up their interest in coal. Certain companies are much more understanding of the need for that connection, others have had to be convinced.

"I don't know if it's exclusive to the coal mining or even the mining industry," Syd offered, "but it seems part of our culture that
we don’t have to hire and retain mining engineers in tight times, all we have to do is spend enough money in good times and we’ll be able to get whatever, or whoever, we want. Mining does differ from all other engineering majors in that we serve only one industry.

“In the late 1990s, the industry was crying for graduates. I tried to tell them then, and I still tell them now, education is a long-term business, it’s not a spigot that can be turned on and off as needed. On average, it takes four-and-a-half years to earn a four-year engineering degree. If we recruit a student for the fall semester now, you’re looking at five years down the road to get him or her. If, half way through that, there is a downturn (in the coal industry), the industry says they don’t want to have this guy or gal, and that person transfers to something else.

“Consol!”, Syd added, “is one company that always is there, bad times as well as good, and Murray Energy, Foundation Coal, Patriot Coal, Arch Coal and a few others, including some equipment manufacturers, also continually support our efforts.

“Among the latter,” he continued, “was Long-Airdox, which at one time was very involved with us. Though Long-Airdox is gone, having been acquired by DBT a few years back and, in turn, has been purchased by Bucyrus, Calvin Kidd, who had been Long-Airdox vice president sales, has remained involved. Now that he is with Continental Conveyor, he continues to host student tours and arrange mine trips for them. Other manufacturers continue to support us as well, including Bucyrus and Joy Mining Machinery, as well as ground control manufacturers, such as Fletcher Roof Bolt and other roof support and bit manufacturers.

“On the other hand, a lot of graduates are concerned by companies that stress bringing engineers into the supervisory ranks because you wind up with more engineers than opportunities. That turns off a lot of graduates; they don’t see their future. Today, people are far more short-term oriented; they expect progression in a few years and fear they will have to wait a long time for advancement. The younger generation,” Syd observed, “really is different. When I came to America I had an objective, not so much the money or where I would be in a year or two, but what I would contribute over a lifetime. Today, if they aren’t going to be upper or senior management team members within a few years, they are reluctant to go there. A generational thing? I suppose it’s debatable.”

On the subject of debates, according to the person who arguably has been on more different longwalls than most experts in the industry, it was not Consol who first brought longwall mining to the States, as has been debated, nor was it Kaiser Steel in Utah, as suggested by Dan Baker of American West Resources in Coal People. It was Eastern Associated Coal Corp.

“It was Eastern who first brought Westfalla Lunen longwall mining from Germany to America in 1951 at its Kopperston operations in Boone County, WV,” Syd
As just a teenager half a world away in Taiwan, Syd Peng (pronounced "Pung") knew where he wanted to go with his life, he just had no idea then how far that eventually would take him, both geographically and professionally. "I was a student in junior high school when I first learned how large the country China was, how rich in natural resources, and how under-explored. Even then, I knew it was in that world I wanted to make my mark."

And make his mark he would, though not in China, not then anyway, and not in mineral exploration, but rather in mineral exploitation as a teacher, researcher, consultant, and author. Today, headquarted in the Mineral Resources Building at West Virginia University, Dr. Syd Peng holds the Charles E. Lawall Chair of Mining Engineering. He is
the former Chairman of the WVU Department of Mining Engineering; has authored four books; has lectured, taught, consulted, and conducted research nationally and internationally, and has been considered by his peers and the mining industry to be one of the world’s foremost experts in ground control, longwall mining, and surface subsidence.

After 45 years in America, and 33 years as an American citizen, the Dr. Syd Peng chronicle still begins in China – his China, Taiwan. Syd Peng was born Syh Deng Peng, a seventh generation Taiwanese in Miaoli. “Miaoli was a small town,” said Syd, “smaller than Morgantown, but today it has become a city of more than 100,000 people.

“My ancestors were Hakkas, a subculture of the Hans and one of the nine ancient ethnic groups of China that now constitutes 7 percent of the country’s population, which, they say, now is comprised of some 300 ethnic groups. The Hakkas,” he continued, “have produced a number of history-making personages in modern China, including Prime Minister Deng Xio Ping who led China’s reform from the late 1970s to the late 1980s.

“The Hakkas were situated in northern China,” Syd related, “but due to many invasions and wars, they went through four major migrations south, beginning around the Third Century AD until the final migration to Hainan Island, Guangxi and Taiwan, and overseas in the last half of the Nineteenth Century. Interestingly,” Syd noted, "they had their own architectural style, considered unique to China and the world. Called tulous, literally ‘earthen structures’, they were built entirely of dirt—‘rammed earth’, a mixture of sand, gravel and clay sometimes stabilized with lime or animal blood. These buildings were circular in construction, typically four-stories high with only one door and no windows on the ground floor for defensive purposes."

continue