Predicting the mine of the future:
SME keynote looks toward the next generation

by William Gleason

The 2015 keynote "The mine of the future: Forecasting opportunities and challenges for the global mining industry," included, from the left, Peter Bryant, Dean Gehring, Red Conger, Bryan Galli, Barry Hudson and Gwenne Hennricks.

What will the mine of the future look like? Will it resemble the current operations that supply the world with the products it needs to function, or will it be something totally different?

How will the demands from the communities that are most affected by mining operations shape the mine of the future? How will technology and innovation be used to help miners reach deposits that are getting harder to access, and what are the dangers of this new world? Who will work at the mine of the future and what will that work look like?

These are questions that do not have definitive answers, not yet, but questions that need to be asked for the mining industry to move into a future that is as filled with uncertainty and challenge as it is with promise and opportunity.

On Feb. 16, the 2015 SME Annual Conference and Expo and 117th CMA National Western Mining Association conference began with a keynote address "The mine of the future: Forecasting opportunities and challenges for the global mining industry." Panelists from five sectors of the mining industry participated in the session, which was followed by the conference and expo, that in large part, were also trying to answer the question of what the mine of the future will look like.

In coming months, *Mining Engineering* will continue the discussions and answer some of the questions submitted by members of the 2,000-person audience during the keynote address in a monthly feature called, "Predicting the Mine of the Future," and in Thought Leaders Podcasts with the panelists and other industry experts.

Forecasting opportunities and challenges

Slower demand from China, India and other emerging markets, lower prices for commodities, political and social pressures and alternative fuel sources have all played a part in the challenging times that have put many sectors of the mining industry in to a slump in recent years.

But, as was pointed out in the keynote session by Red Conger, president Americas, Freeport-McMoRan, gloom and doom forecasts are nothing new for the industry. To illustrate his point, he showed the infamous cover from *BusinessWeek* magazine in 1982 that proclaimed "The Death of Mining," as if the publication assumed the world already had enough raw materials in supply.

Conger pointed out that his company, and the industry, survived the downturn then, and it will again. What might be different for this cycle though, is the role that technology and innovation will play in shaping the mine of the future.

"We typically don't develop new technology, we tend to adopt and adapt, which is different from being innovative," keynote panelist Dean Gehring, president and chief executive officer, Rio Tinto Minerals, told *Mining Engineering*. "Innovation is largely applying technology in new ways than we have before. And to realize continuous improvement, or to make large step changes, we will have to be as innovative as we have been."

Gehring predicted that the next big change for the industry will come through the ability to collect data and act on that information. During his presentation, he noted that he could receive real time data from haul trucks operating at remote sites around the world through his cell

phone. He also cautioned that such data needs to have context with it, otherwise it paints an incomplete picture.

He said that it is crucial the industry engage its stakeholders, build trust with them through transparency and build context to provide the full story, not just the headlines.

"The biggest opportunity that we see in the next decade is the chance to piggyback off of the technological revolution," said keynote panelist Gwenne Hennricks, vice president, product development and global technology, Caterpillar. "Its exponential growth in computing power, data storage and sensor technology that provides us with the opportunity to collectively align data that can be used to ensure our productivity across the entire commodities value chain. Given the rate of technical advancements, I believe that we may well see an unmanned mine within the next decade."

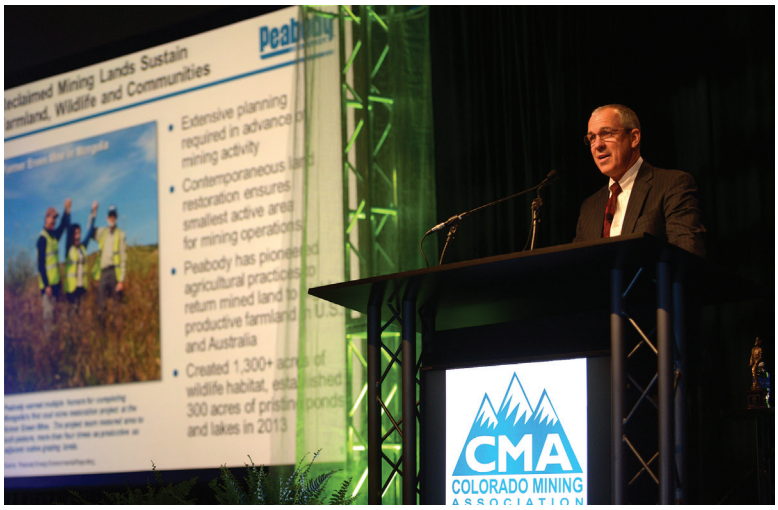
A walk through the largest exhibit hall in the history of the SME Annual Conference (more than 600 companies occupying more than 900 spaces) and one would have seen what Gehring and Hennricks were talking about, an industry that is embracing the latest and greatest in technology. On the floor there were drones that are being used to help find deposits, track supply chains and monitor mining operations around the world. There were suppliers of software programs that will help miners run their equipment more efficiently, safely and, sometimes, remotely, and consultants to help plan the mine of the future.

In the keynote address, Conger said, "The mines of the future will not be found, but will be built. And they will be built with sincere relationships and hard work for the benefit of all stakeholders."

Conger, Hennricks and Gehring were joined in the panel discussion by moderator by Peter Bryant, senior fellow and honorary cofounder of the Kellogg Innovation Network, Bryan Galli, group executive and chief marketing officer, Peabody Energy, and Barry Hudson, director of aggregates northern Europe, HeidelbergCement.

Each panelist spoke to his or her field of expertise, but the common theme among them was that the mine of the future will have to be more efficient, safer, more environmentally friendly and more transparent.

Gehring said technology will allow the mines of the future to exchange real time information around the world, but with that comes risks. He noted that when information is available and interesting, it will be shared. "And if our data is shared without context, we are going to find ourselves constantly on our back foot trying to explain our data, and by that time it's just too late," he said.



Bryan Galli speaks to a crowd of about 2,000 during the keynote address of the 2015 SME Annual Conference & Expo in Denver, CO, Feb. 16.

Like all mining sectors, the aggregates industry is in a time of transition and facing challenges with the changing landscape. Hudson said the industry is seeing the smaller operations disappear as larger companies take them over. The industry is also facing increased legislation from around the world to operate cleaner and quieter, and is under more scrutiny from regulatory as well and nongovernmental organizations. Add in the fact that reserves are getting more difficult to find and process, Hudson said the aggregates industry will need technology to streamline its operations.

"Real time data is key for us. It allows us to make decisions that we couldn't make before," said Hudson. "I think the big hurdle is we don't categorize our product well, we don't talk about anything but the size of the product and we need to take the characteristics and really understand them and then we might be able to mine lower grade material."

Political pressure, pressure from environmental groups and an addition of an abundance of natural gas to the energy mix have combined to make things extremely difficult for the coal sector in the United States. But Galli said technology and innovation will help the industry survive.

Peabody advocates three key approaches that are essential to 21st century coal. First, responsible mining that uses best practices to continually improve productivity and resource recovery that puts environmental stewardship and safety at the forefront. Second, focus efforts to eliminate energy poverty and ensure that all people have access to reliable, low cost energy. Third, continue the advancement of near zero emissions through the advancement of clean coal technologies.

In the coming months, *Mining Engineering* will focus on these issues and other questions that the industry will have to answer en route to the mine of the future. ■