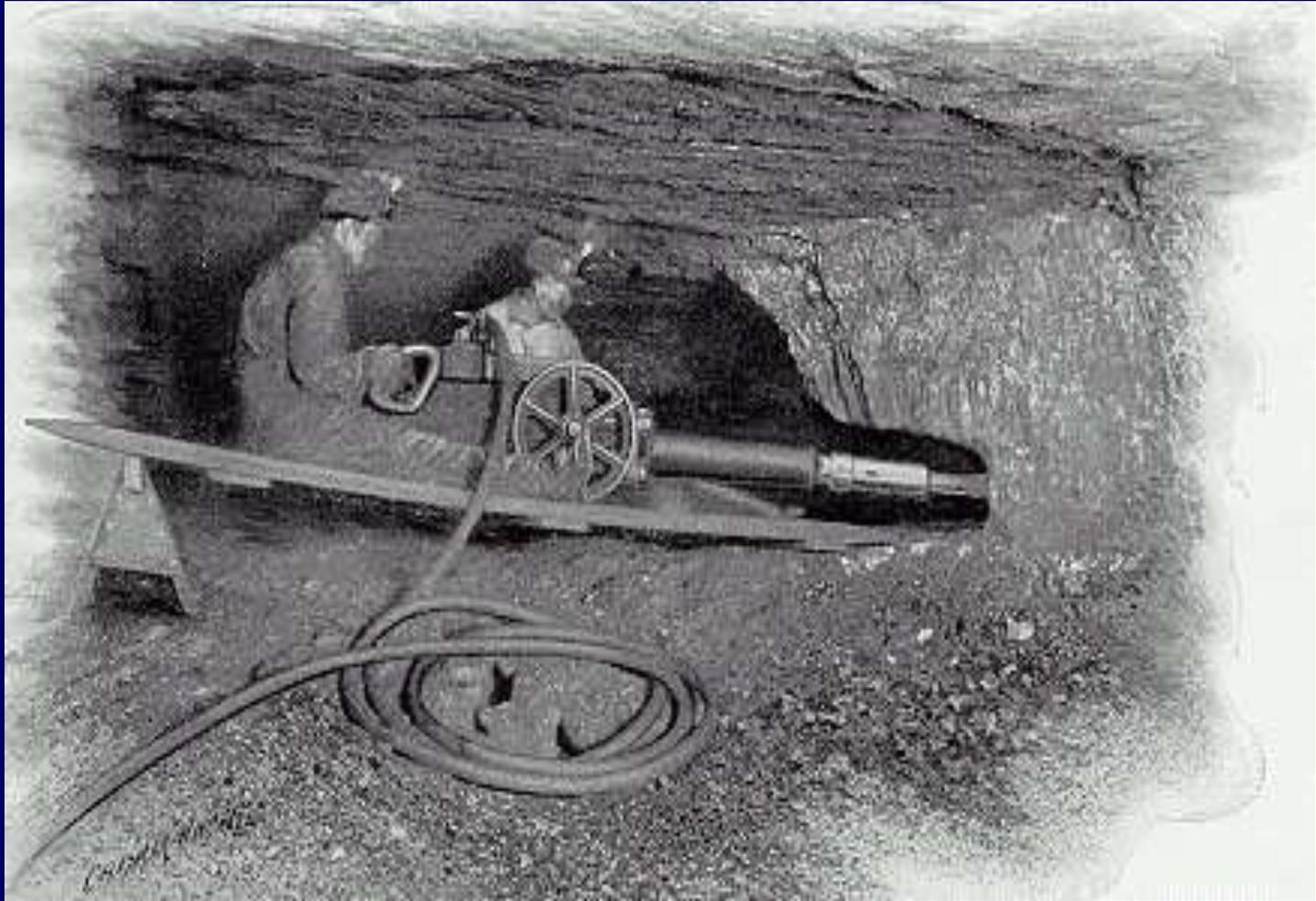
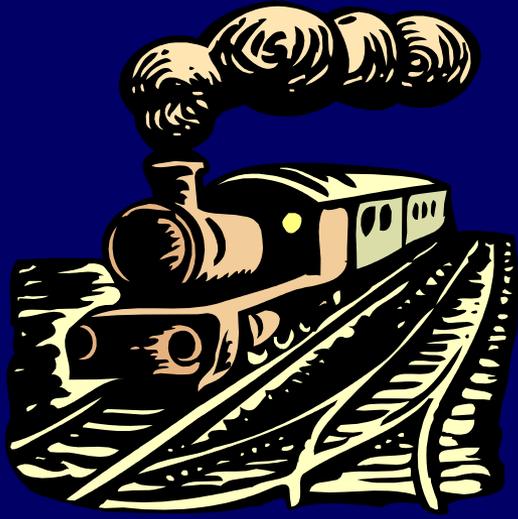


New Technology & Challenges in Coal Mining



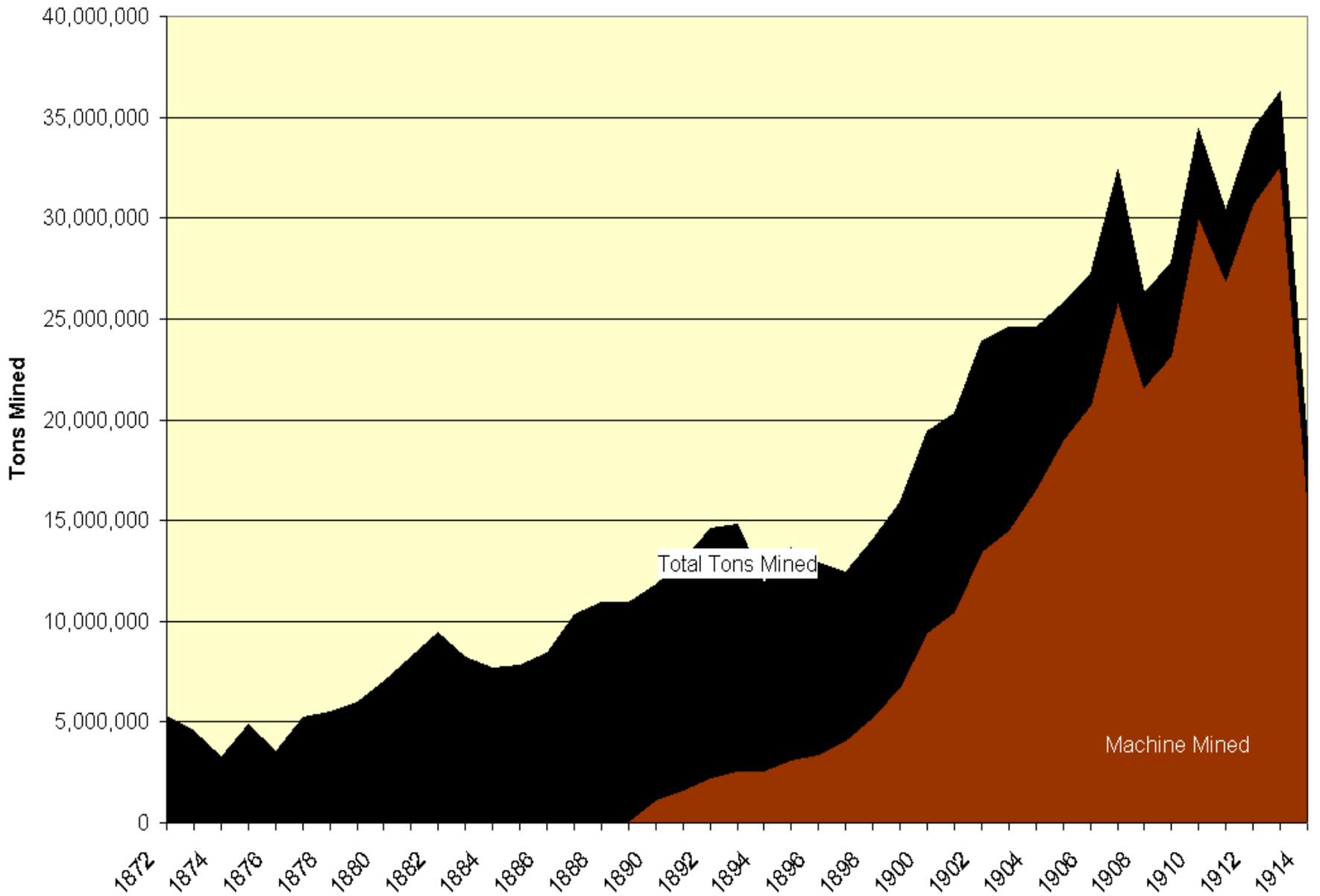


Development of the use of machines for mining the coal came toward the beginning of the 20th century when demand for coal also increased. The new factories, using more modern technology also needed for coal to fuel the machinery.



Increased use of the railroads to transport the machine-made products also demanded more coal to fuel the train engines. The profits were high for coal-mining companies and production soared!

Coal Mined in Ohio, 1872-1914





The average number of tons of coal produced per man employed in 1890 was 575.

The average per man per day was 2 tons!

By 1900, 720 tons of coal were mined for each man employed, and the average tonnage per man per day was 4 tons!

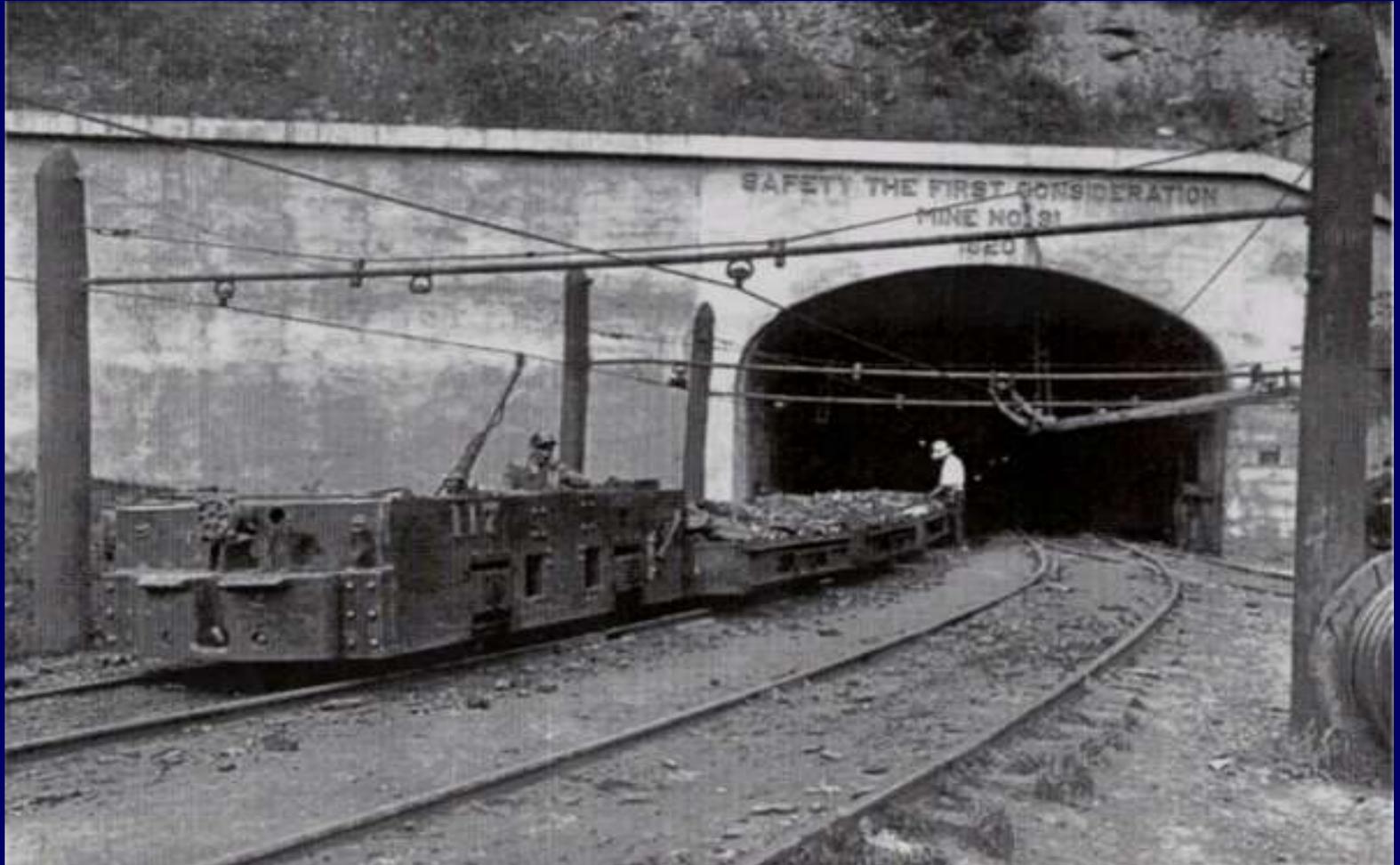
Coal towns became highly mechanized with machinery replacing heavy, dangerous jobs...

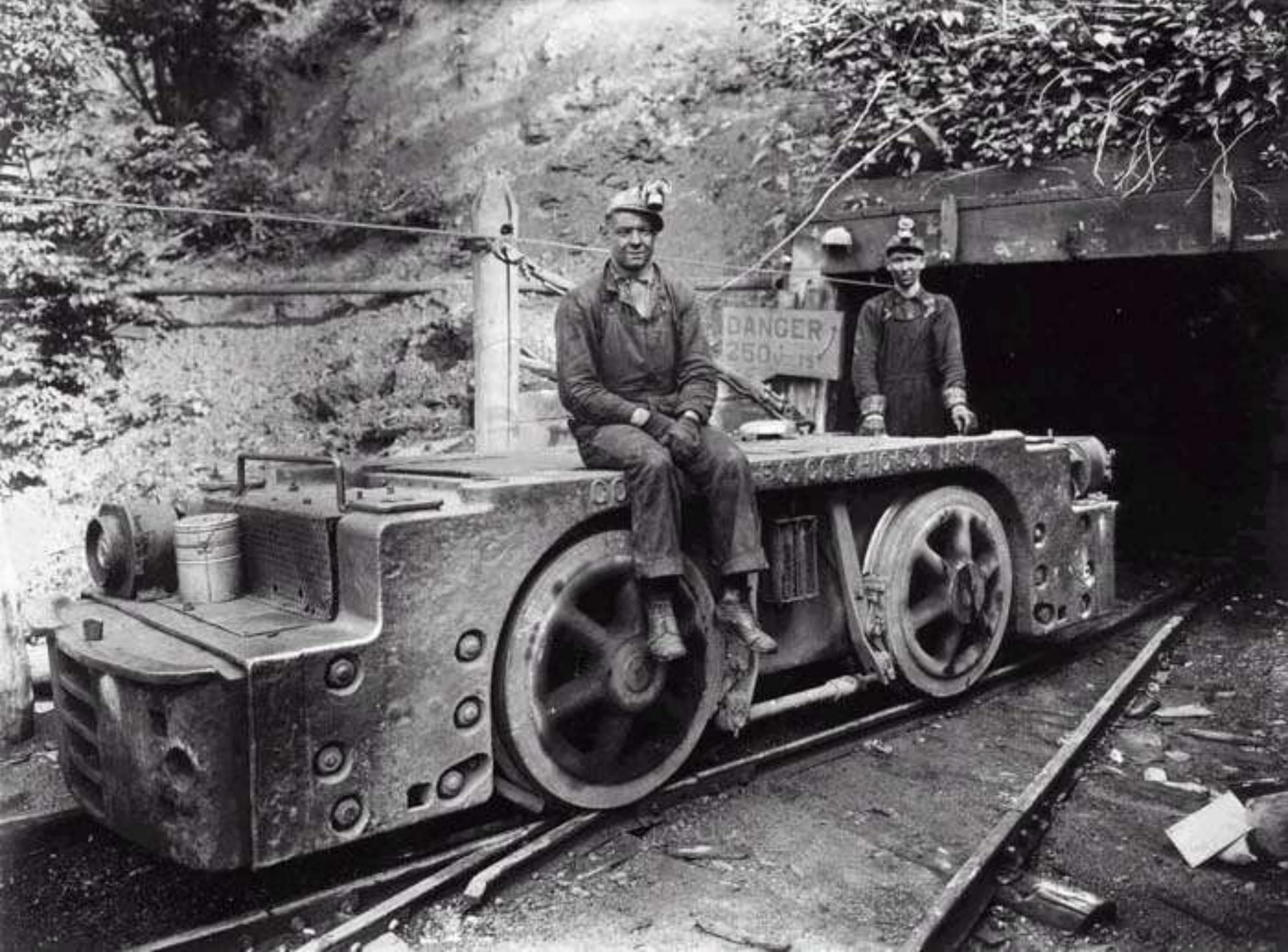


Railroad cars replaced horses and mules in removing the coal from the mines...



*By the 1930s, these railroad cars could be operated by a safer form of energy-
electricity.*





Electric lighting systems were also brought into the mines.



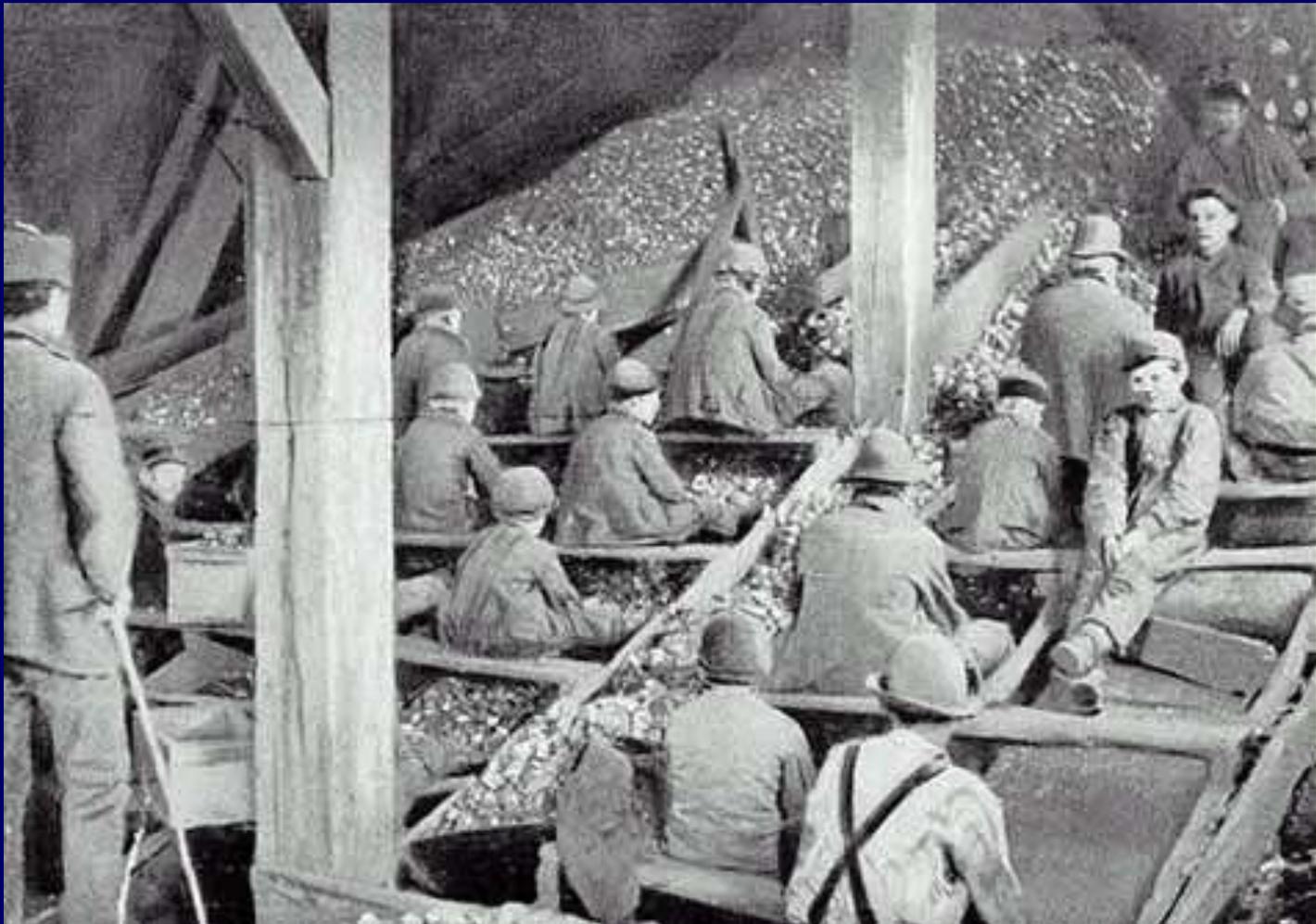
The invention of the automobile soon brought trucks and mobile cranes to load coal for easier transport.



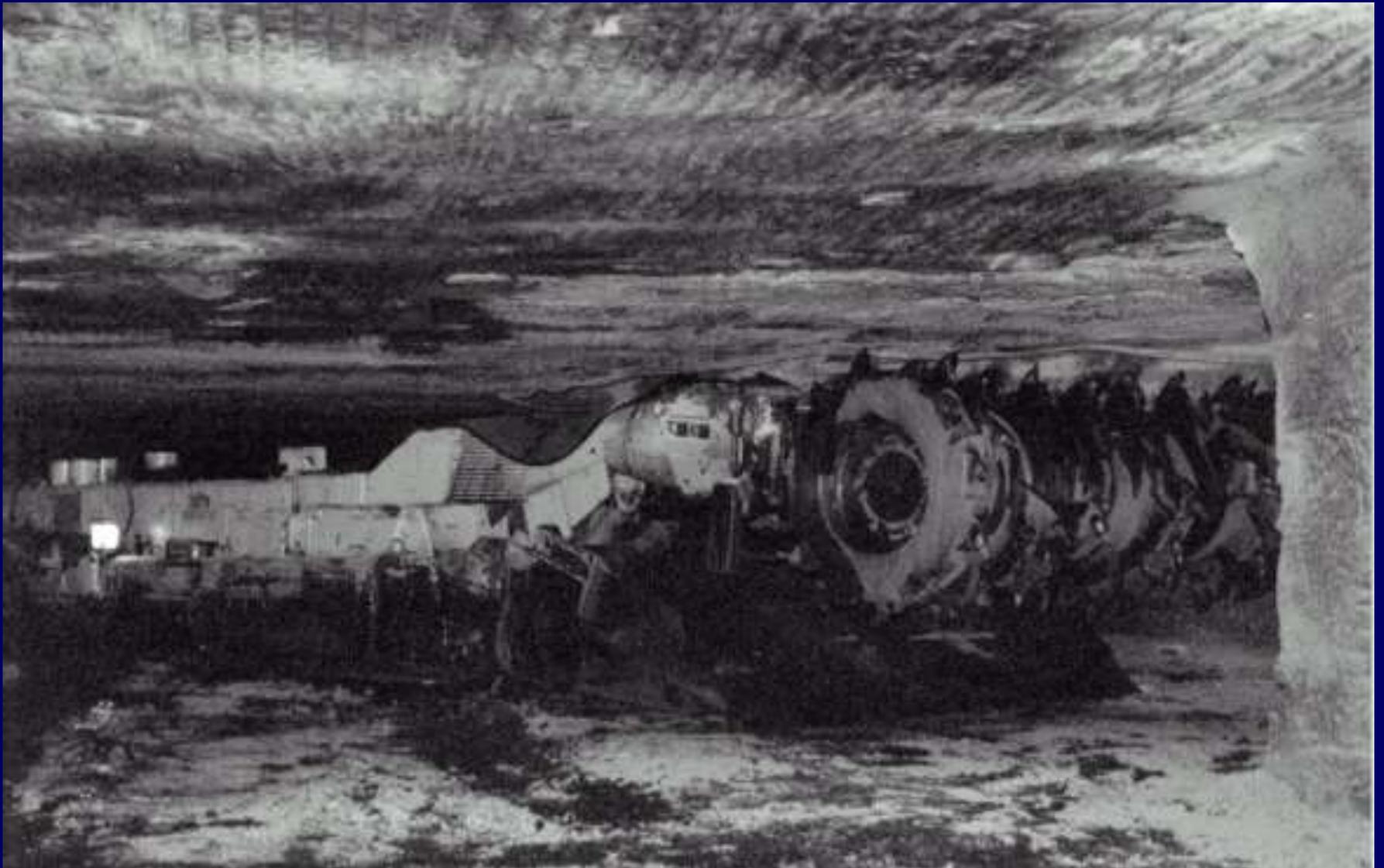
Special locomotives were created for hauling larger tonnage of coal.



*(Boys at work in a mechanized,
moving Coal Breaker.)*



(Power-driven, rotating cutting machinery.)

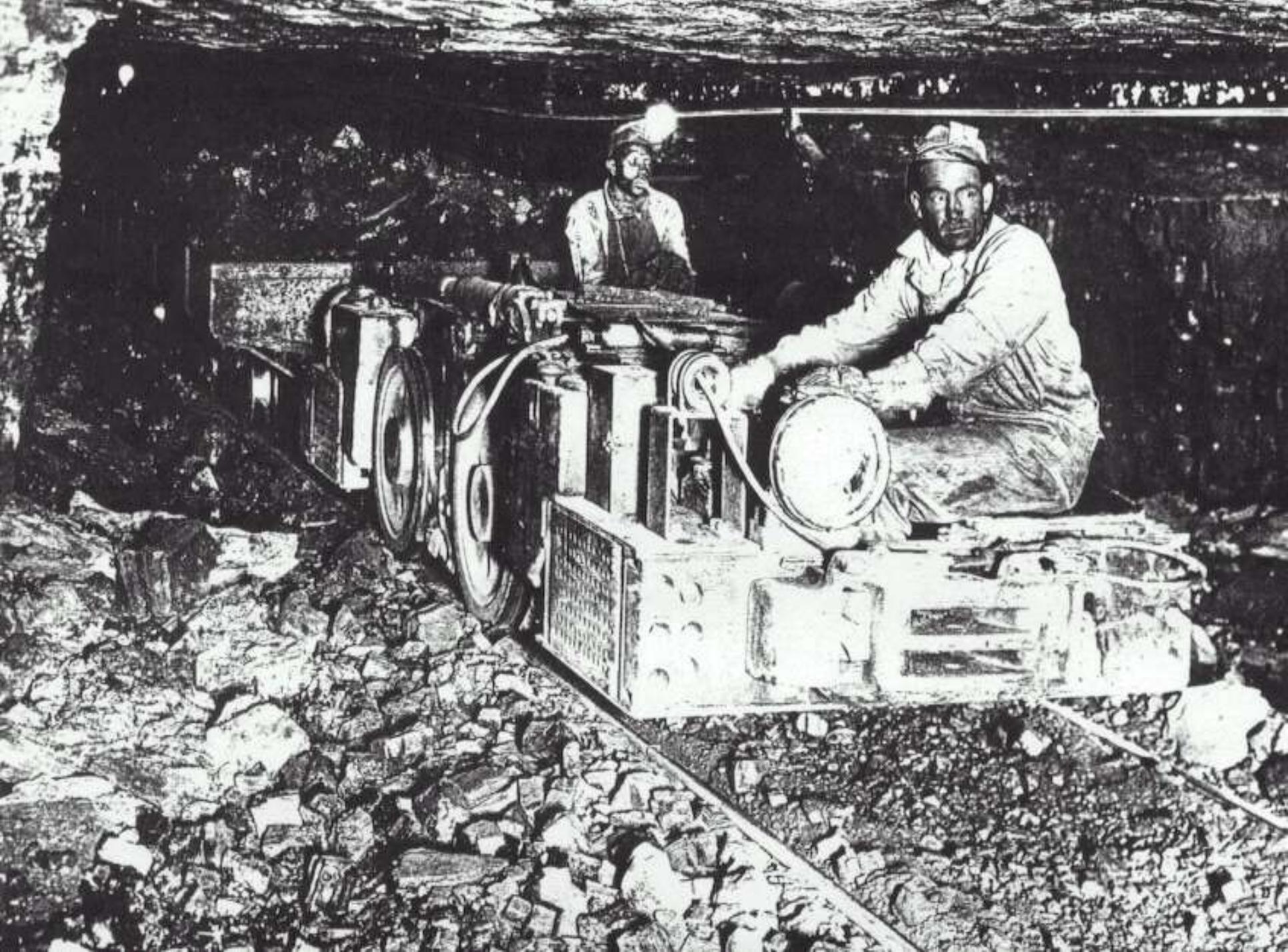


*(Modern cutting operations churn
away at a coal vein.)*



Although miners still work in cramped spaces, the accident rate has greatly lowered due to improved safety precautions.





Professional coal-mining rescue workers are available to assist in any emergencies. Most are former coal miners or descendants of miners...



*And due to federal Child Labor laws,
no more children are allowed to work in
the dangerous mines.*



The standard of living for some miners improved,



...while others continued to work for low wages until organized labor successfully negotiated on the miner's behalf.



*Most miners today are members of the
United Mine Workers of America,
a labor union that represents their interests.*



A new method of mining developed in the 20th century. Surface (or "pit") mining now is the method used to mine about half of all of the coal mined each year.



Underground mining will not be abandoned.
Although it is more difficult, much of our
best coal is underground.



COAL MINING AND OUR ENVIRONMENT

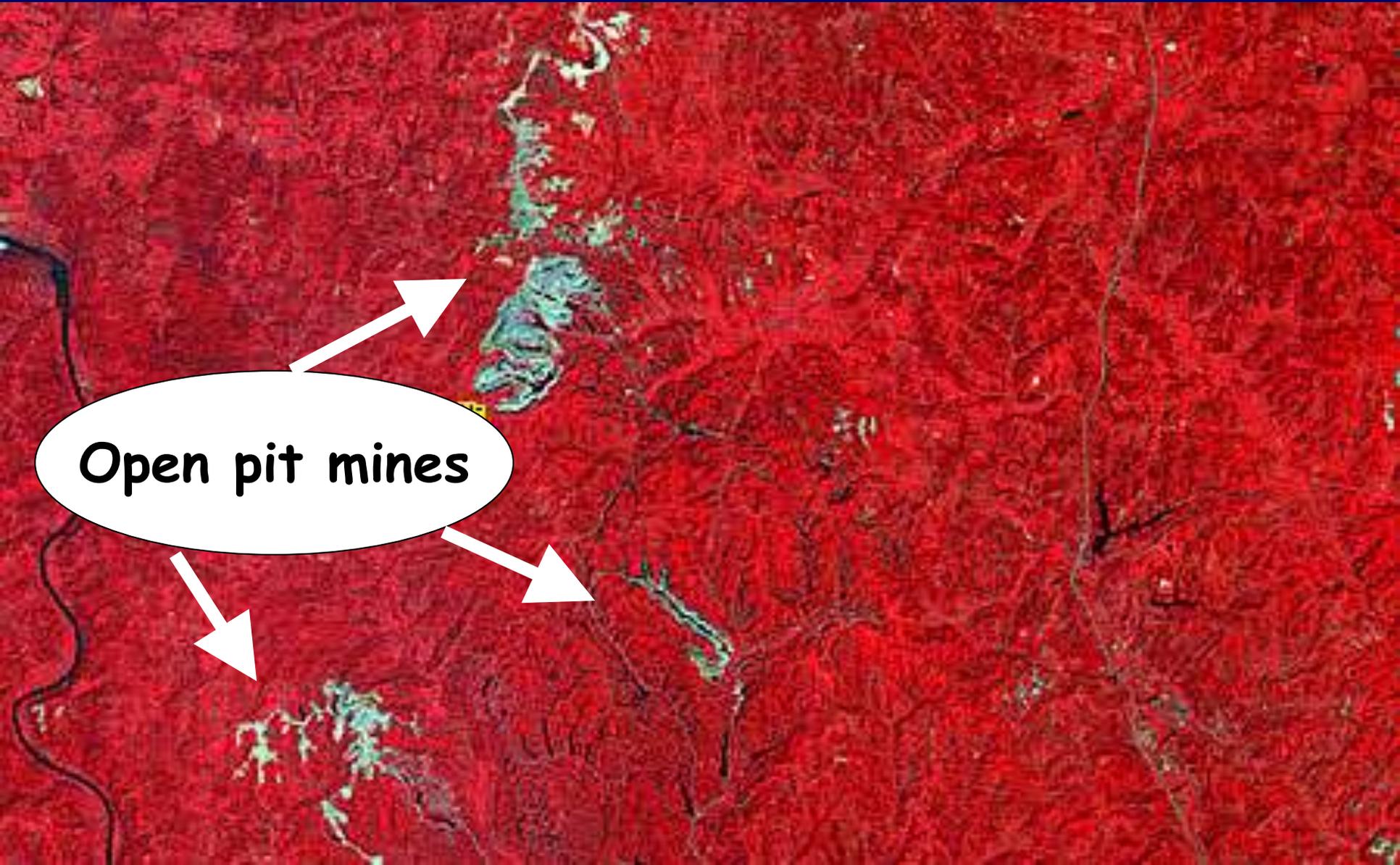


Because mining activities often come into contact with water resources, getting rid of potentially harmful effects on the water has long been a primary concern.



Millions of dollars are spent by coal producers to contain, treat, or prevent damage to ground and surface waters.

These satellite images show coal mining in eastern Ohio. In these images vegetation is red.



Open pit mines

300 million years ago, central Ohio was covered by a shallow, inland sea. Swamps grew and conditions were just right for the dying plants to form layers of peat, which were transformed into coal through pressure.



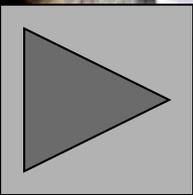
The Ohio River flows through this region.
Minerals exposed to the water becomes "acidic."

Ohio River
and tributaries





A common process that results from open pit mining is the mixing of groundwater with the soil, causing "acid drainage." The highly acidic water is rich in minerals such as sulfur. The water may become highly toxic and may have harmful effects on humans, animals, and plants.



More than 66,500 documented sources of coal mine drainage in Appalachia have polluted an estimate 10,000 miles of streams.



Land reclamation is now an important part of the surface mining process. Restoring land includes the following steps:

- Leveling of soil,
- The replacement of topsoil, and
- Reseeding with native vegetation.



To meet federal requirements, mines are replanted for agricultural use.



The dark red shows new grow of vegetation where the older pit mines were located.



Old mines

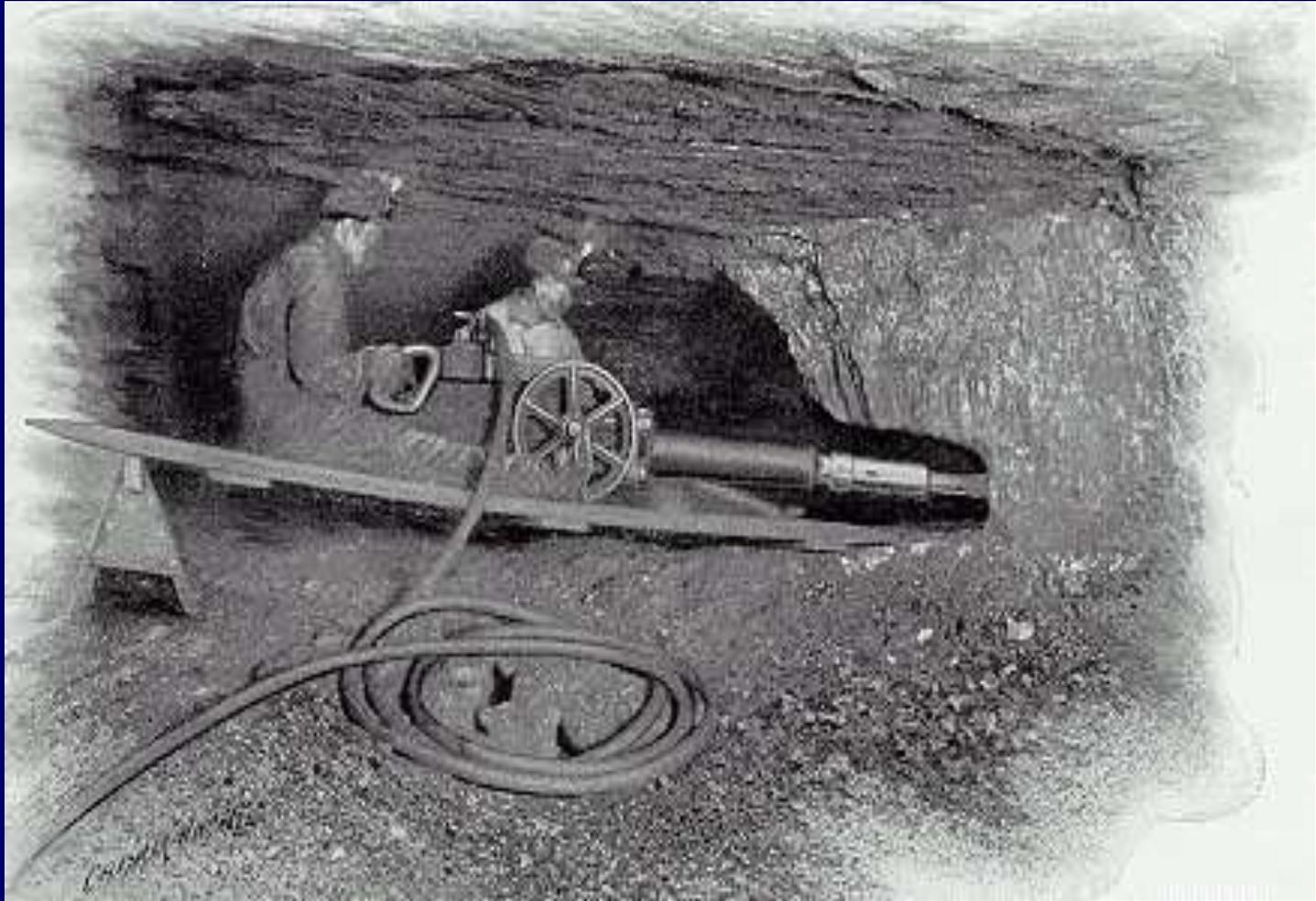
New Mines



These activities take place as a result of two primary federal laws :

the Clean Water Act and the Surface Mining Control and Reclamation Act.

New Technology & Challenges in Coal Mining



Sources:

United Mine Workers

Mining Association of Pennsylvania

United States Geological Survey

