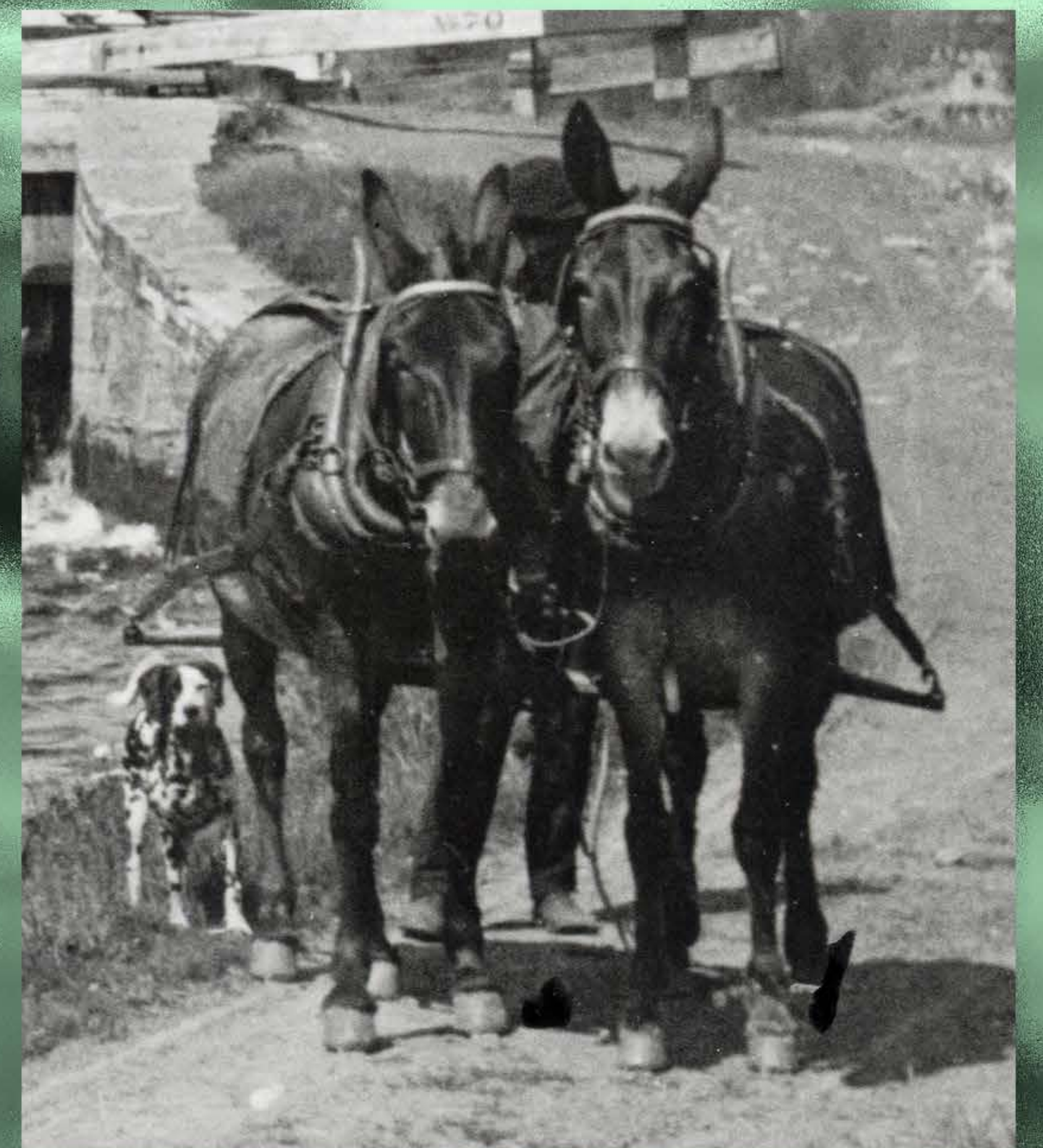


# Hybrid

# Vigor:

## The History & Science of Mules

There's more  
to mules than  
you think...





# So, what is a mule, anyway?

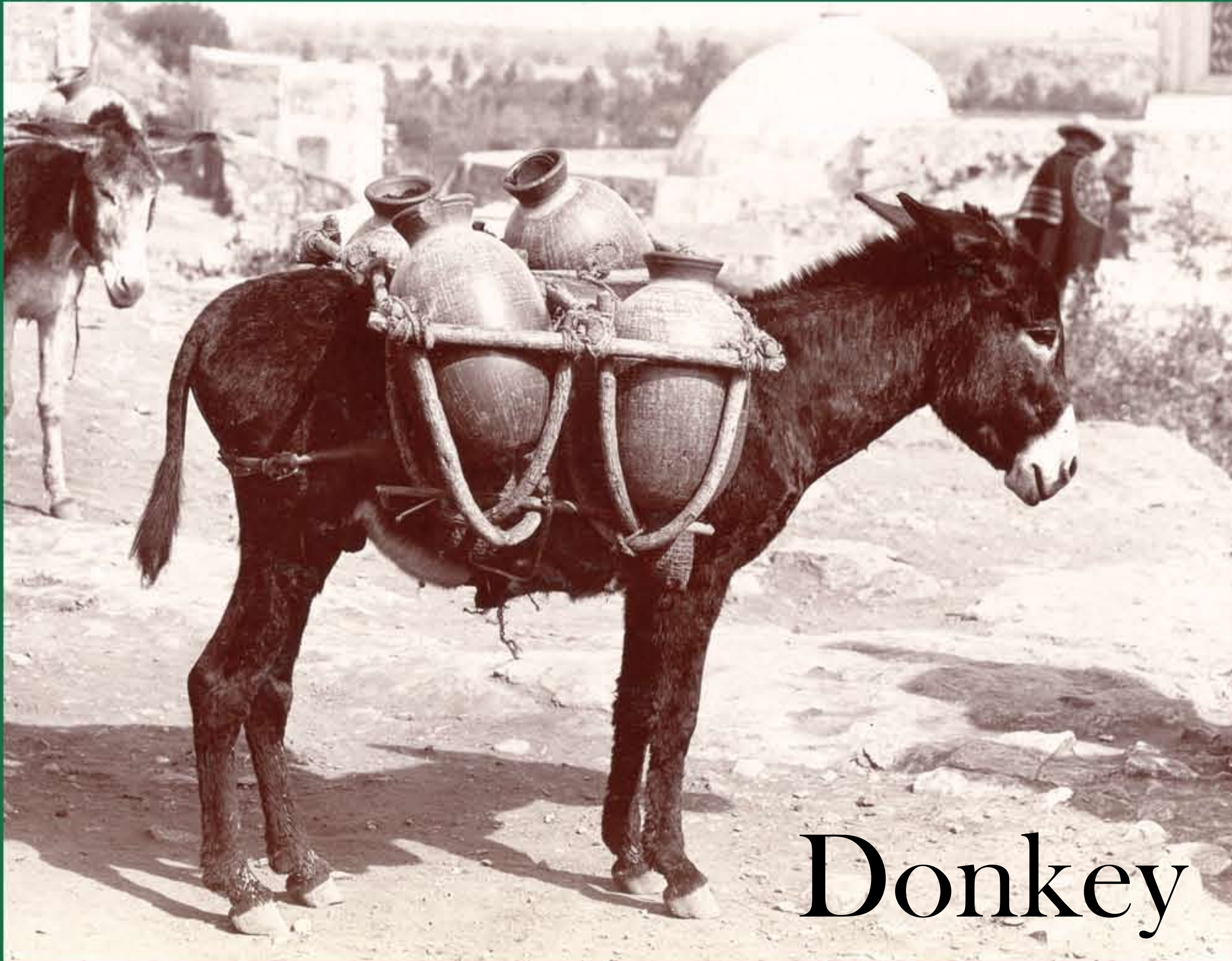


Image courtesy of the New York Public Library

Mules come in both male and female, and in all shapes, sizes, and colors. They range from under 50 pounds to over 1,000 pounds! In general appearance, they do look like both horses and donkeys.



Image courtesy of NYPL



Images of George Washington, King Charles III, and Marquis de LaFayette courtesy of NYPL

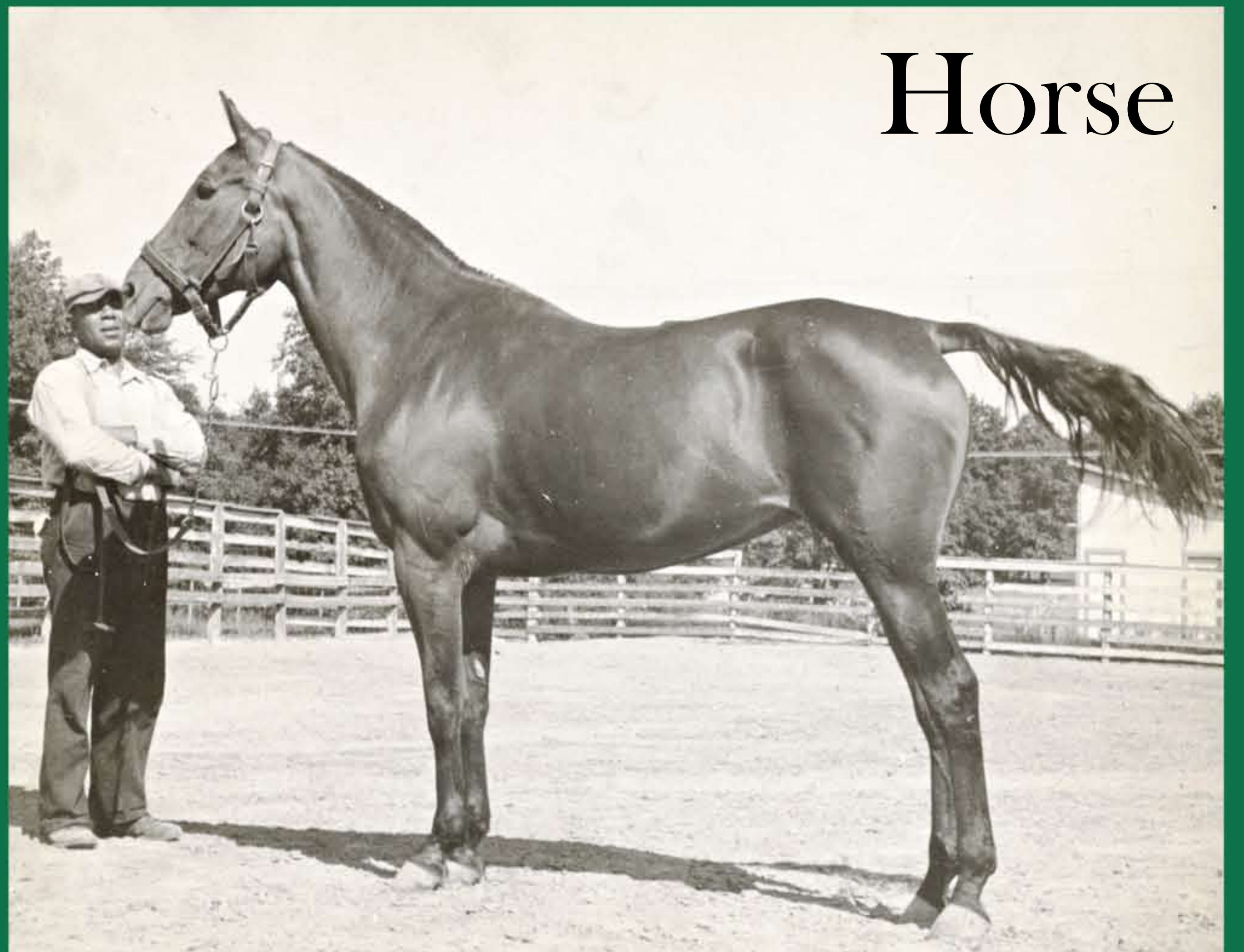


Image courtesy of NYPL

Simply put, a mule is a hybrid animal. It is the product of a male donkey (a jack) and a female horse (a mare). Mules do occur in the wild, in areas where horses and donkeys share territory, but the deliberate creation of mules is one of the first examples of genetic engineering by humans. A hinny is the converse of a mule (female donkey, male horse), but conception is difficult for this pairing so hinnies are very rare. Horses have 64 chromosomes, donkeys have 62; mules end up with 63. Usually they have incomplete reproductive systems, and so are most often sterile. Very occasionally, female mules are fertile, though! There have been fewer than 70 cases of mules giving birth since 1527.

George Washington was the father of the Great American Mule. He started his mule breeding program with the help of donkeys supplied by King Charles III of Spain and the Marquis de LaFayette. The original donkey from Spain was christened with the name “Royal Gift.”

By the time of Washington’s death in 1799, there were 63 mules working at Mount Vernon, and the mules bred there eventually became the backbone of American agriculture. By 1808, there were 855,000 mules in the United States.



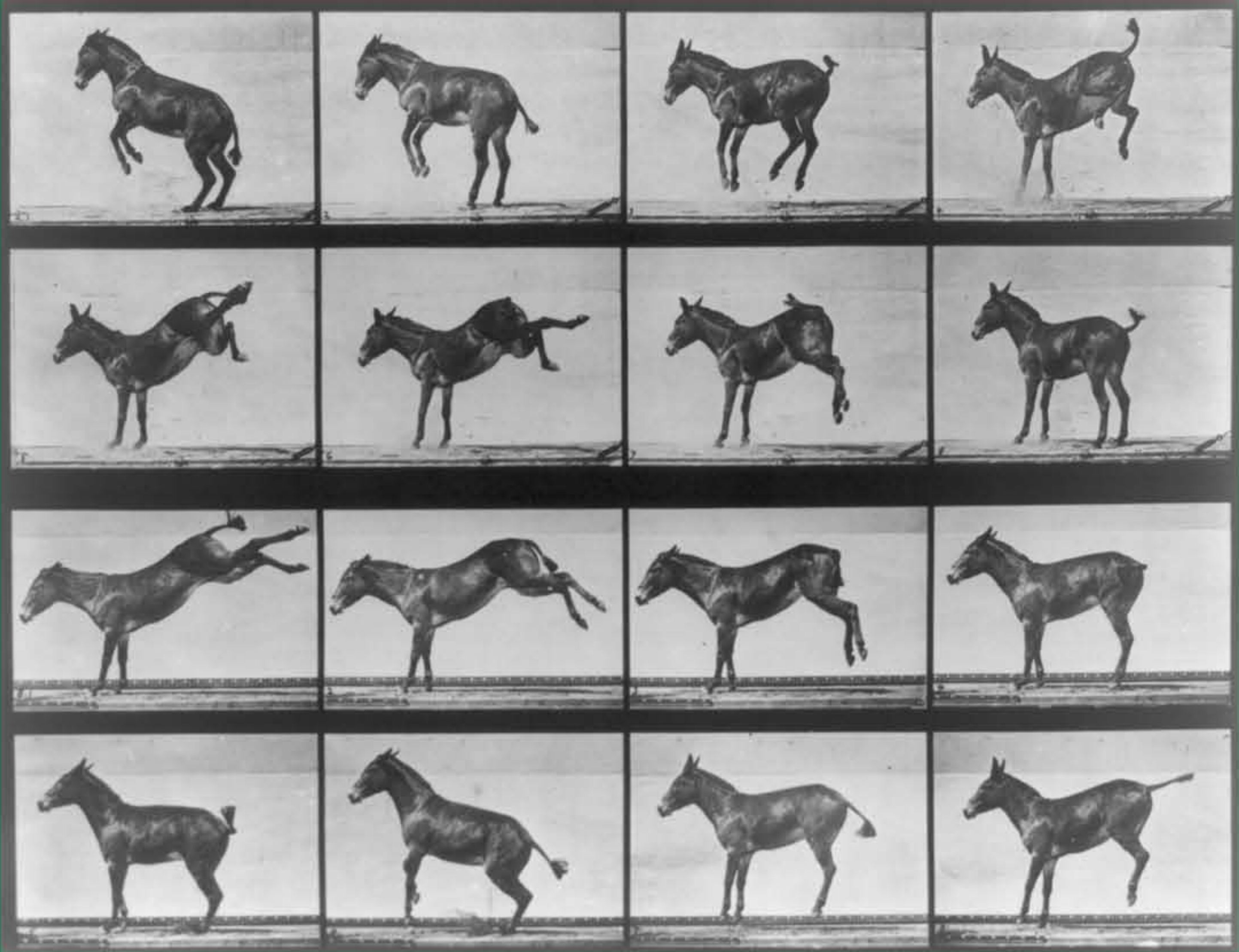
Mules are neither stupid nor stubborn!

# Mule Qualities & Quirks

Image courtesy of LOC



Image courtesy of the Library of Congress



**DISPOSITION:** Many mules seem to have a sense of humor, along with a business-like attitude. They are cautious, but confident enough to evaluate a new situation without fear or agitation. Mules also bond strongly to their human families.

Image courtesy of the New York Public Library



**HYBRID VIGOR:** the tendency of hybrid plants and animals to be stronger, healthier, and hardier than either parent. So what does this quality mean for mules?

-Mules are very fast runners. The 1976 Great American Horse race (3,500 miles across the country) was won by a mule. The winning animal was a mule named Lord Fauntleroy (Leroy for short), with 315.47 hours in the saddle.

-Mules have harder hooves and have a smoother and more sure-footed gait in rugged or steep terrain than horses do.

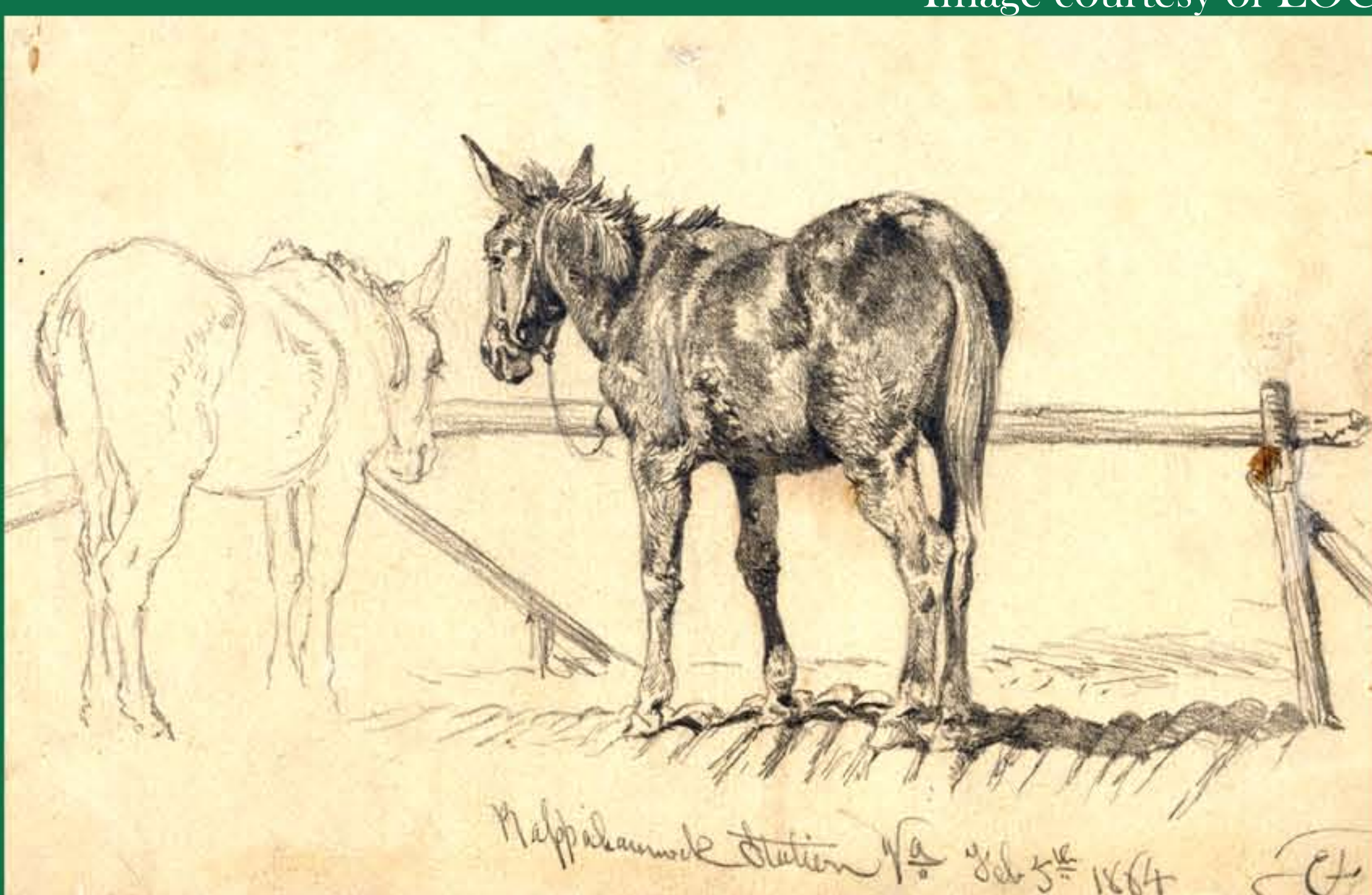
-Mules live and work 5-10 years longer than horses, on average.

-Mules have healthier teeth than horses.

-One of the most distinctive features of mules are their ears. They're twice as long as a horse's, and half as wide as a donkey's.

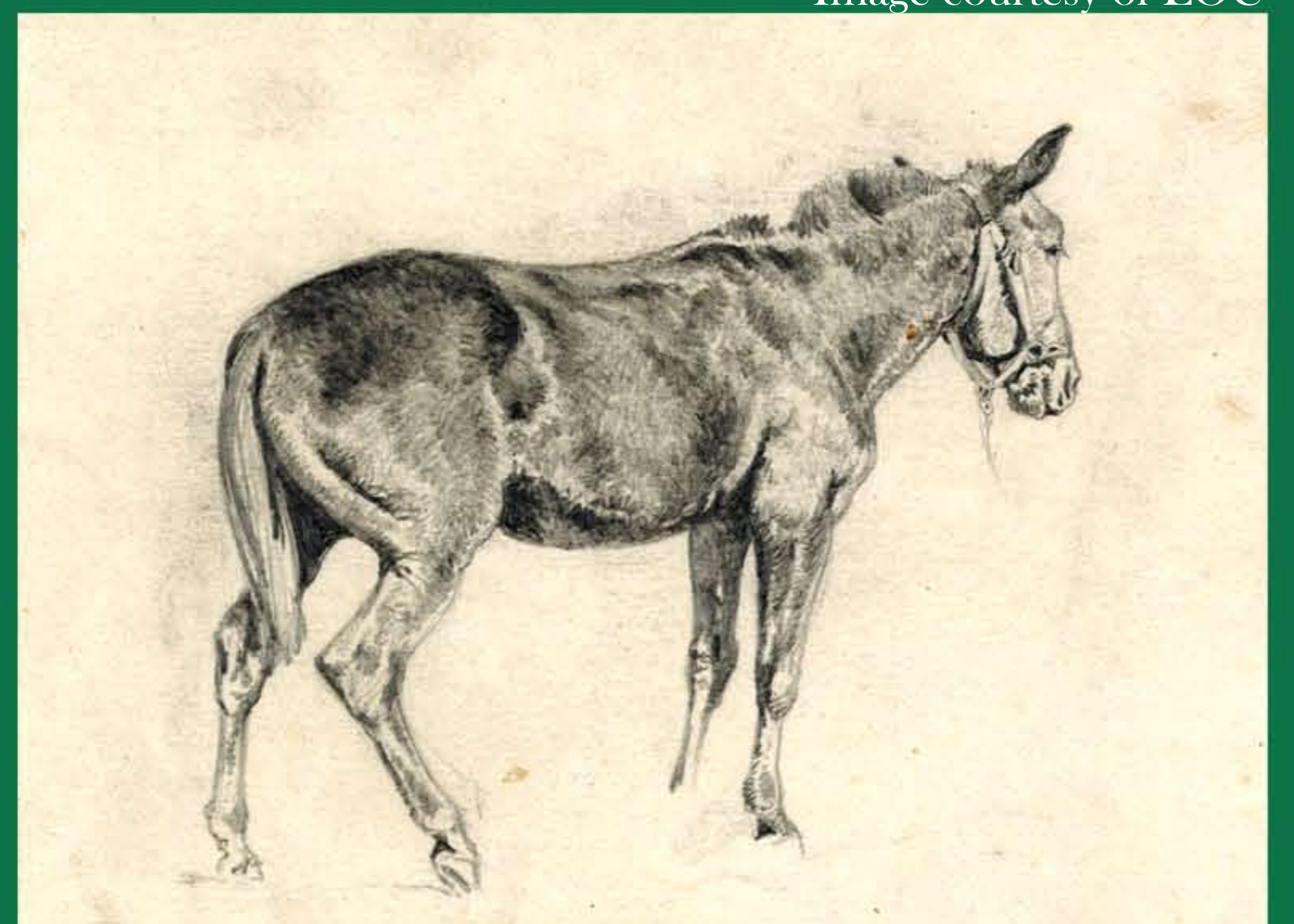
**STUBBORN?!** Mules are not as eager to please as horses. They have a strong sense of self-preservation, know their limits, and do not easily exceed them on behalf of humans.

Image courtesy of LOC



Edwin Austin Forbes drew these mules during the Civil War. He managed to capture both their quiet dignity and physical strength.

Image courtesy of LOC





# Canal Mules!

Erie Canal mules pulling a canal boat.



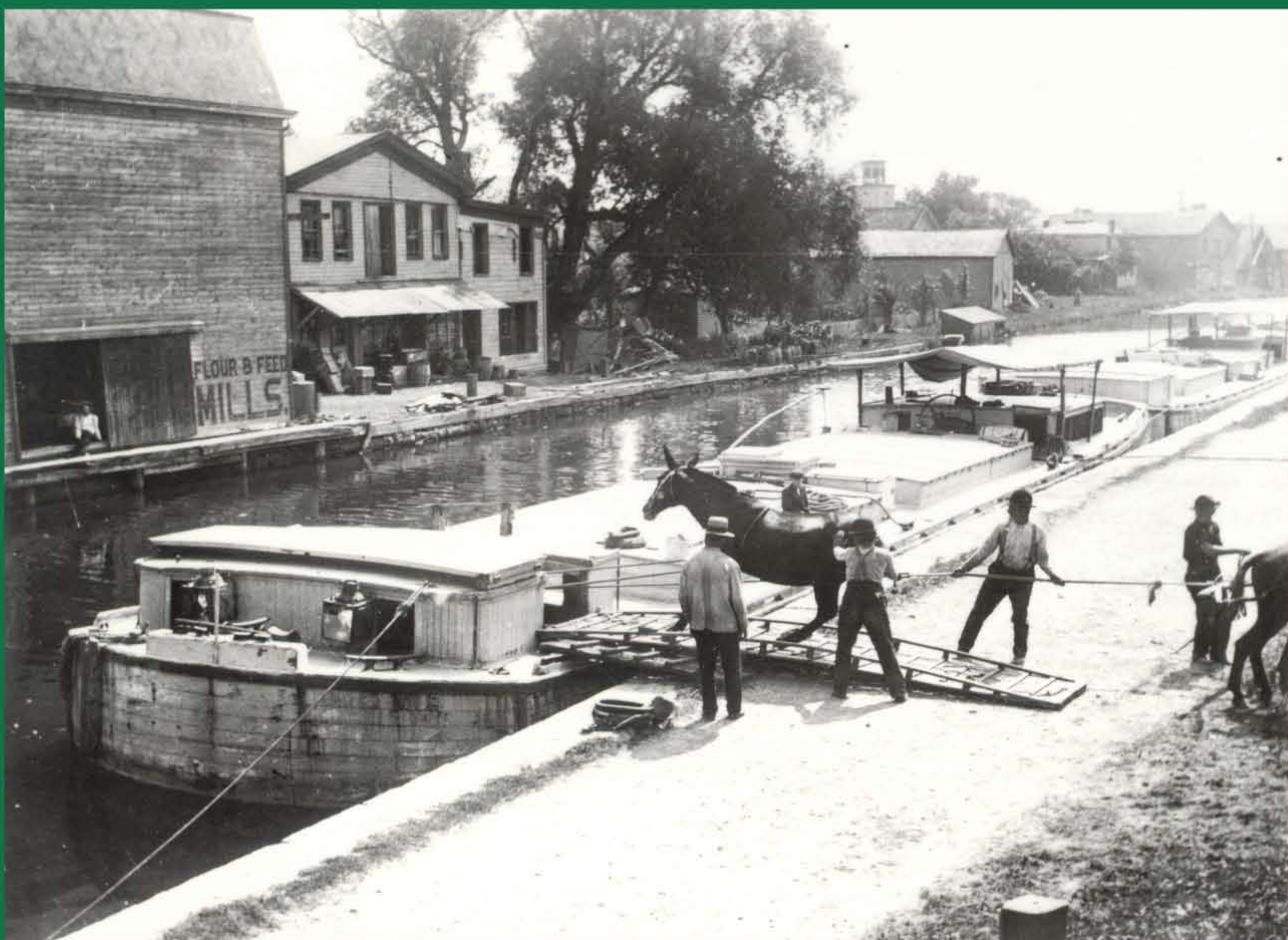
Mules had a pivotal role in the creation and operation of 19th century canals, including New York's own Erie Canal! They became essential to the success of manmade waterways.

Tailing on



Mules initially assisted in the construction of canals, and were used to haul away dirt, rocks, foliage, and debris. They also hauled building materials and equipment. Once the canal was finished, the function of it depended on mules and horses pulling boats along the towpath. Boats on the Erie Canal would usually have two shifts of mules and drivers, working for a 6-hour shift each.

Off-duty mules were kept in stalls on the boats until it was their turn to pull again. Some captains rented mules from barns along the Erie Canal, rather than keeping their own onboard. One hour before beginning work, the mule driver (who was often a teenage boy) tended to the spare team of mules in the stable of the canal boat. He would feed, water, and groom the mules, and then harness them up. When ready, the second mule team would climb out of the stable and be walked down the gangplank to the towpath. They would then switch places with the first team of mules.



Switching mule teams.



German language newspaper from 1888. Notice the inset image of the mule driver struggling with his team of mules.

The process of loading mules onto canal boats was called “tailing on.” When the driver held the mule by the tail, he helped to balance the animal while it walked onto the boat. It only took about five minutes to change out the mule team.





Image courtesy of the Library of Congress

This song captures some of the mule’s best traits, such as speed and a no-nonsense attitude!



Black River Canal.

# “I got an old mule and her name is Sal...”

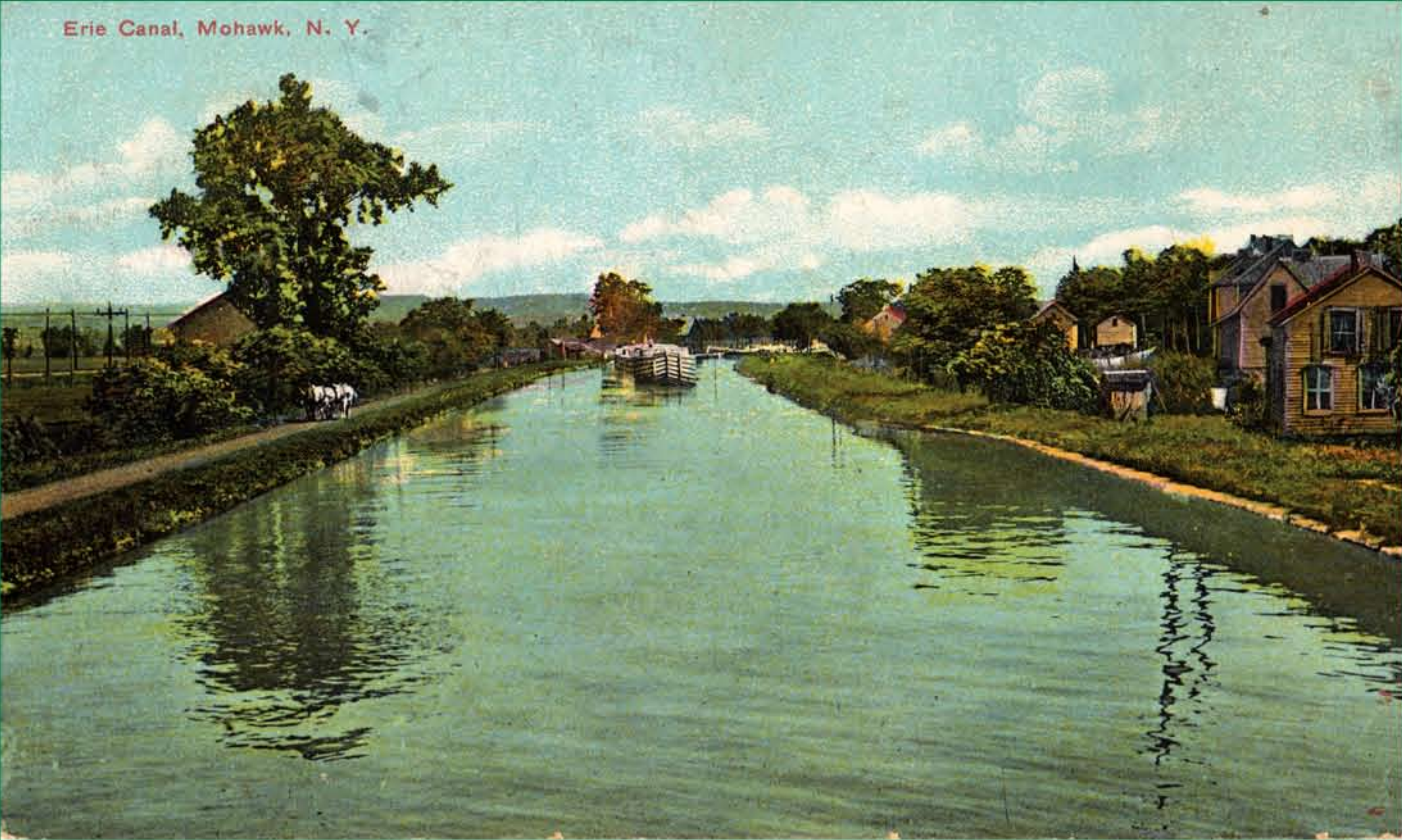
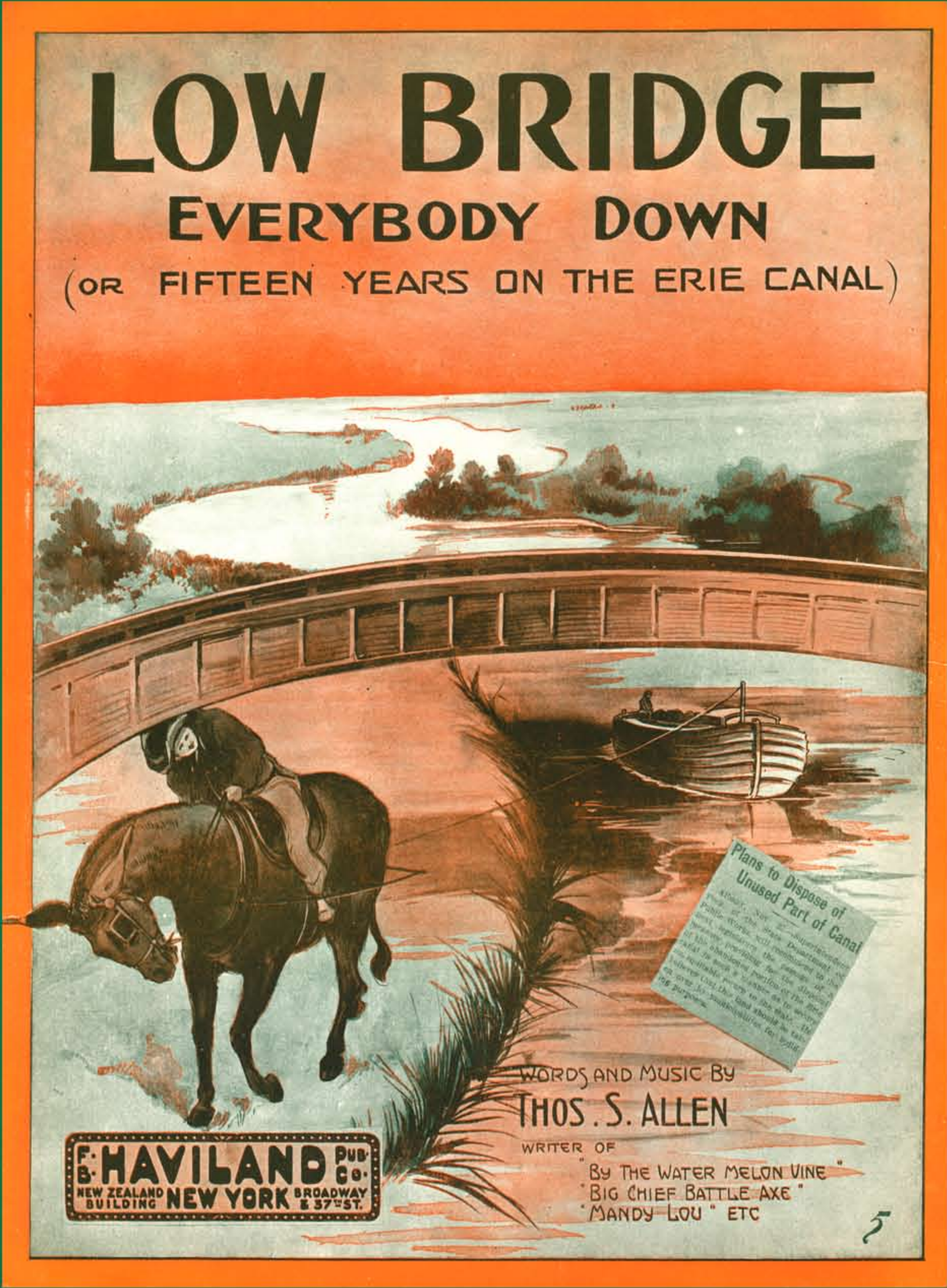
A very famous mule of song!

Thomas Allen’s famous 1912 tribute to life on the Erie Canal is a close reading of Sal’s traits, and she’s stated to be a “good ol’ worker and a good ol’ pal.” The song is a lament for the end of the towpath (Enlarged) Erie Canal, which was closed in the early part of the 20th century, to be replaced by the Barge Canal, which was used by motorized boats.

Although they have evolved, the lyrics of the chorus as originally written were “fifteen years on the Erie Canal.” Some people now sing “fifteen miles.” There is a popular misconception that this was the length of Canal over which mules would pull a boat in a given shift. Distance was not measured in miles for mule-towing, but in hours. And the number of miles covered in a 6-hour shift varied widely, depending on weather, terrain, traffic, and number of locks to get through.

Poor Sal and her driver were soon to be out of a job, after working together on the Canal for fifteen years.

“Low Bridge” was not the only song to capture the romance of mules and the Erie Canal. “Never Take the Hindshoe from a Mule” is another song about the nature of mules, and how you would be well-served not to harass one! This song was a rewritten version of a popular tune called “Never Take the Horseshoe from the Door.”



“Low Bridge” also symbolizes the relationship between mules and their drivers. “We'd better look 'round for a job old gal Fifteen years on the Erie Canal 'Cause you bet your life I'd never part with Sal Fifteen years on the Erie Canal...”

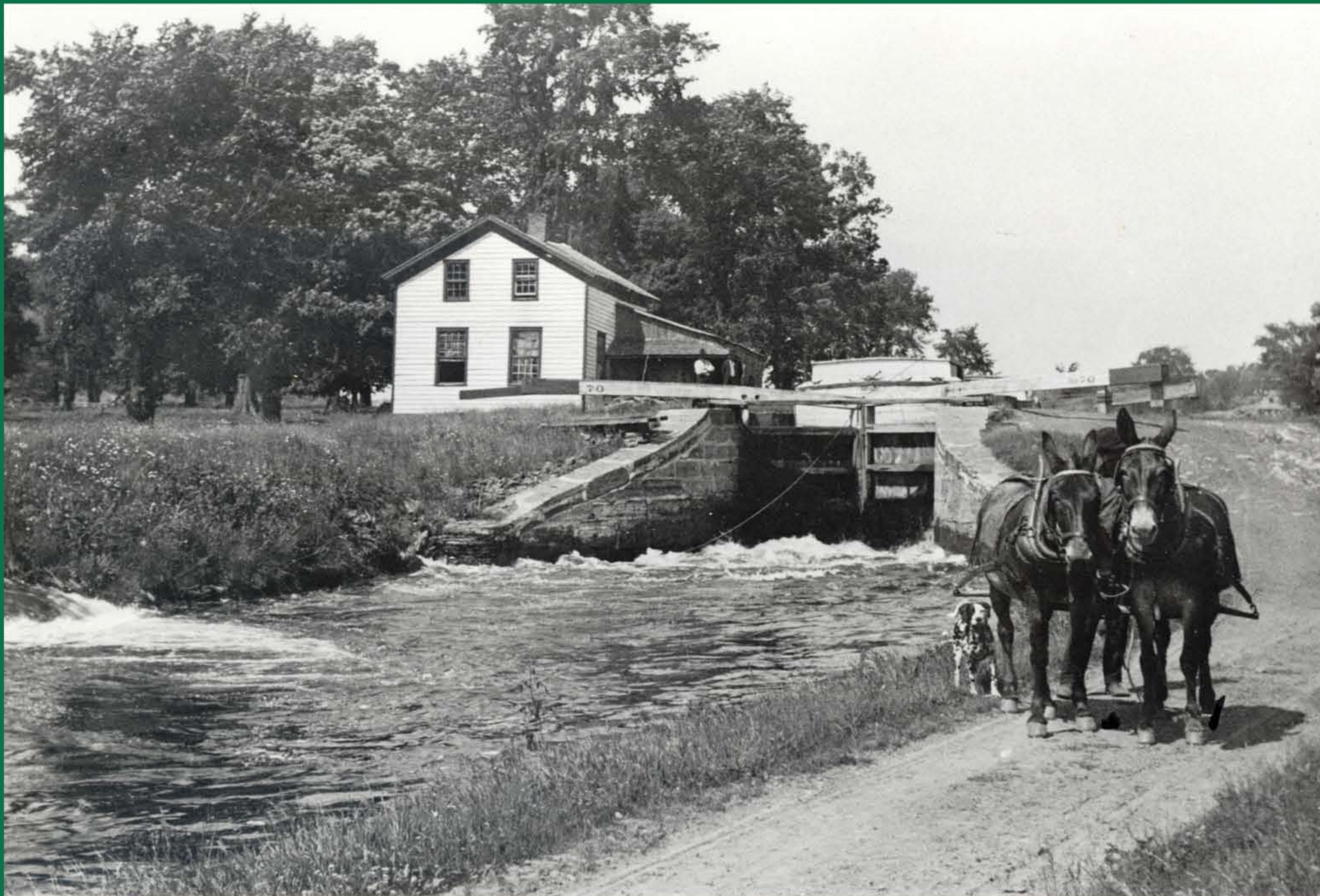


# Canal Mules!

Mules pulling a work cart during the construction of the modern Barge Canal.



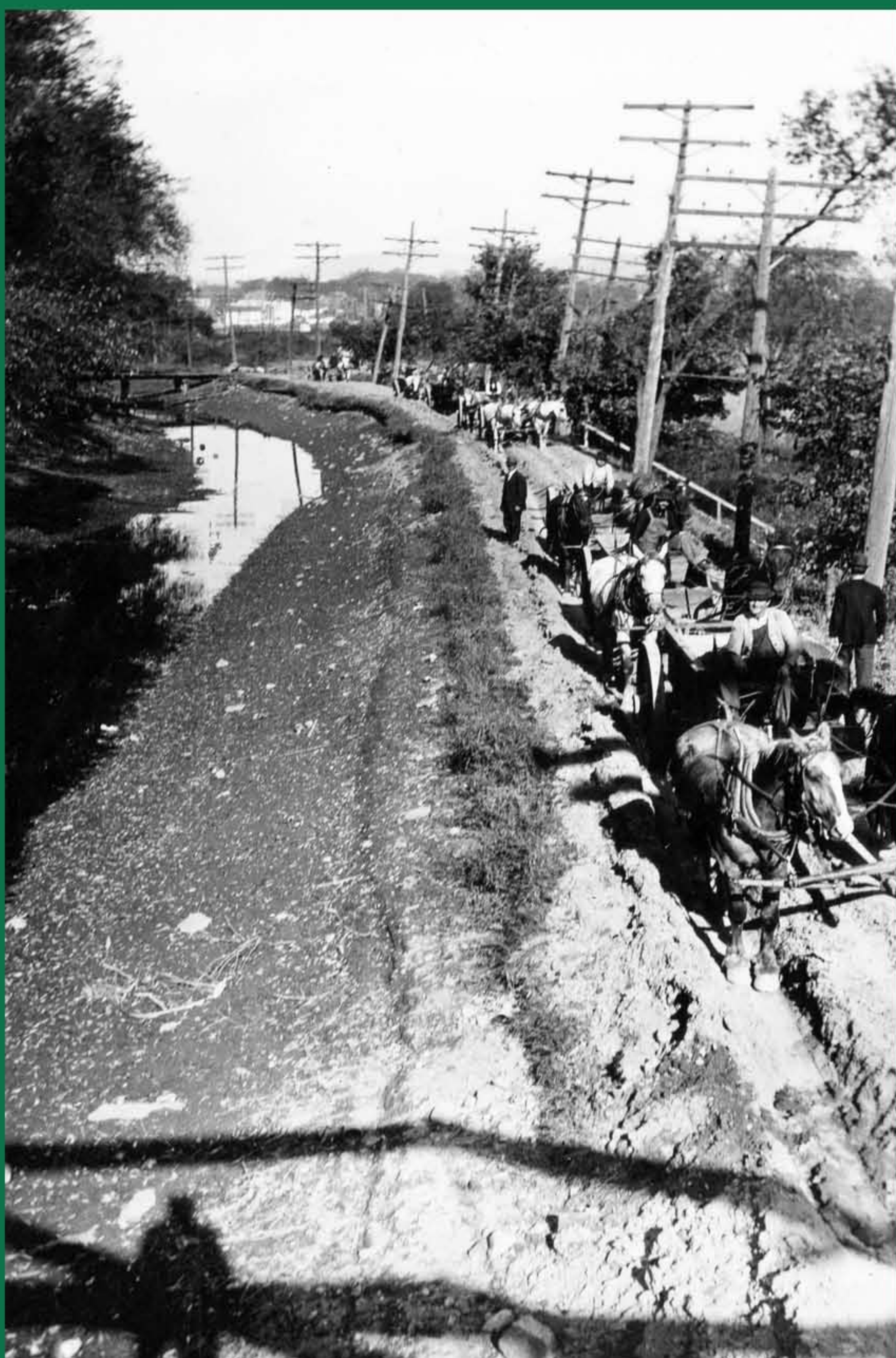
Mules were ideally suited to life on American canals. Their intelligence, strength, and sure-footedness made them better than horses for the task at hand.



Mules pulling a boat through Lock 70 on the Black River Canal, a 35 mile feeder canal for the Erie.

Mules have smaller hooves and stronger ankles than horses, making them more nimble, especially when walking on the towpath on rainy days. Sometimes a snagged towline dragged a mule or horse backwards into the canal. Mules found it easier to climb out of the canal and back onto the towpath, reducing the likelihood of drowning.

Work team with mules along the Champlain Canal.



Mules were often used to pull work boats and line boats (which carried both passengers and cargo); packet boats (passengers only) were more often pulled by horses. Mules can live a long time, often thirty to forty years, and on average, they could work pulling canal boats for upwards of thirty years.

Mules also pulled boats on canals in other states. This image shows a canal in Allentown, Pennsylvania.





# Canal Mules!

Mules are still pulling boats on canals, but since the mid-20th century, their work is recreational! Check out these images of mules at work on non-New York canals.



The mules who pull boats on Pennsylvania's restored Lehigh Canal.



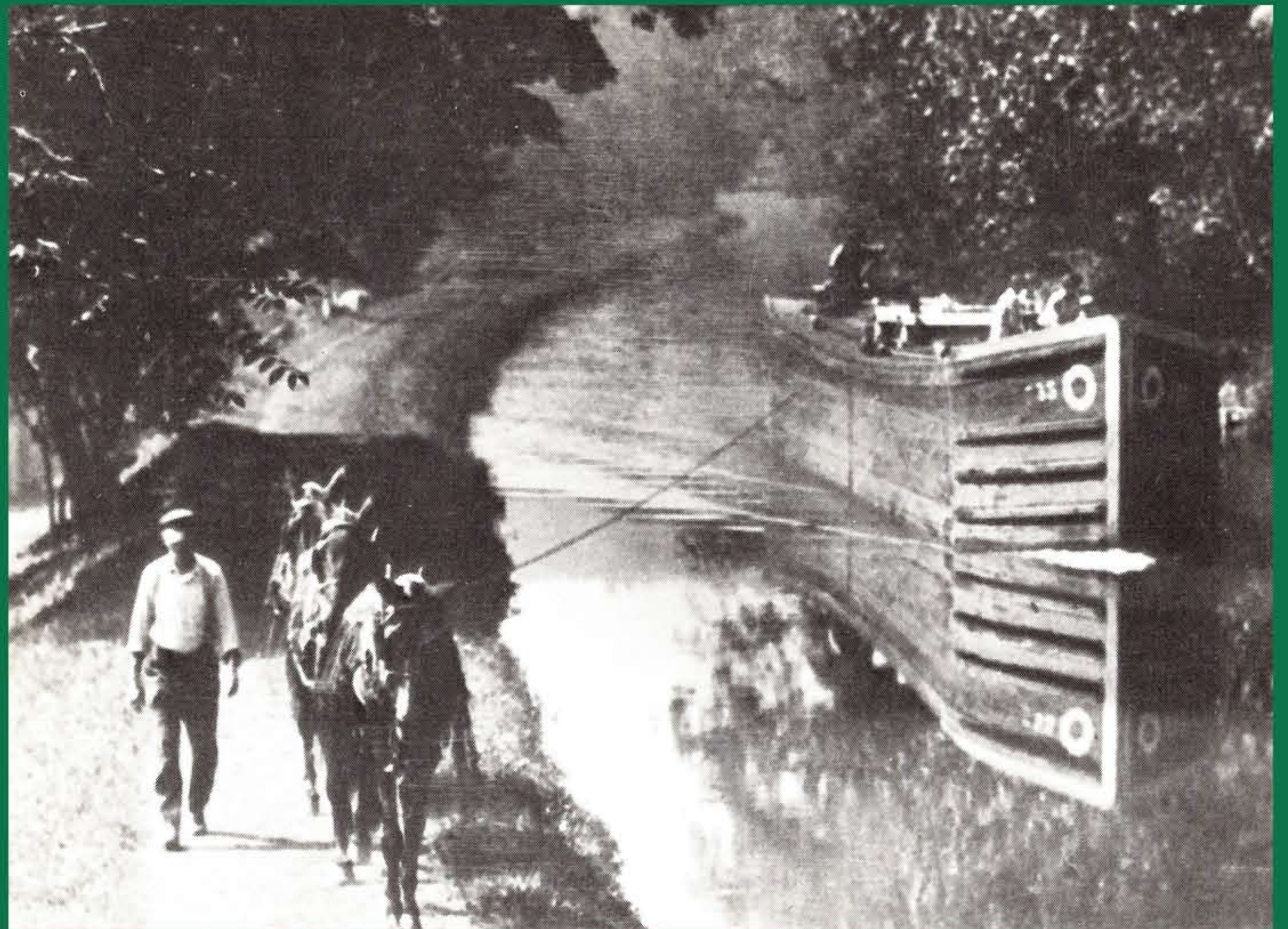
The Chesapeake & Ohio (C&O) Canal, Washington D.C.



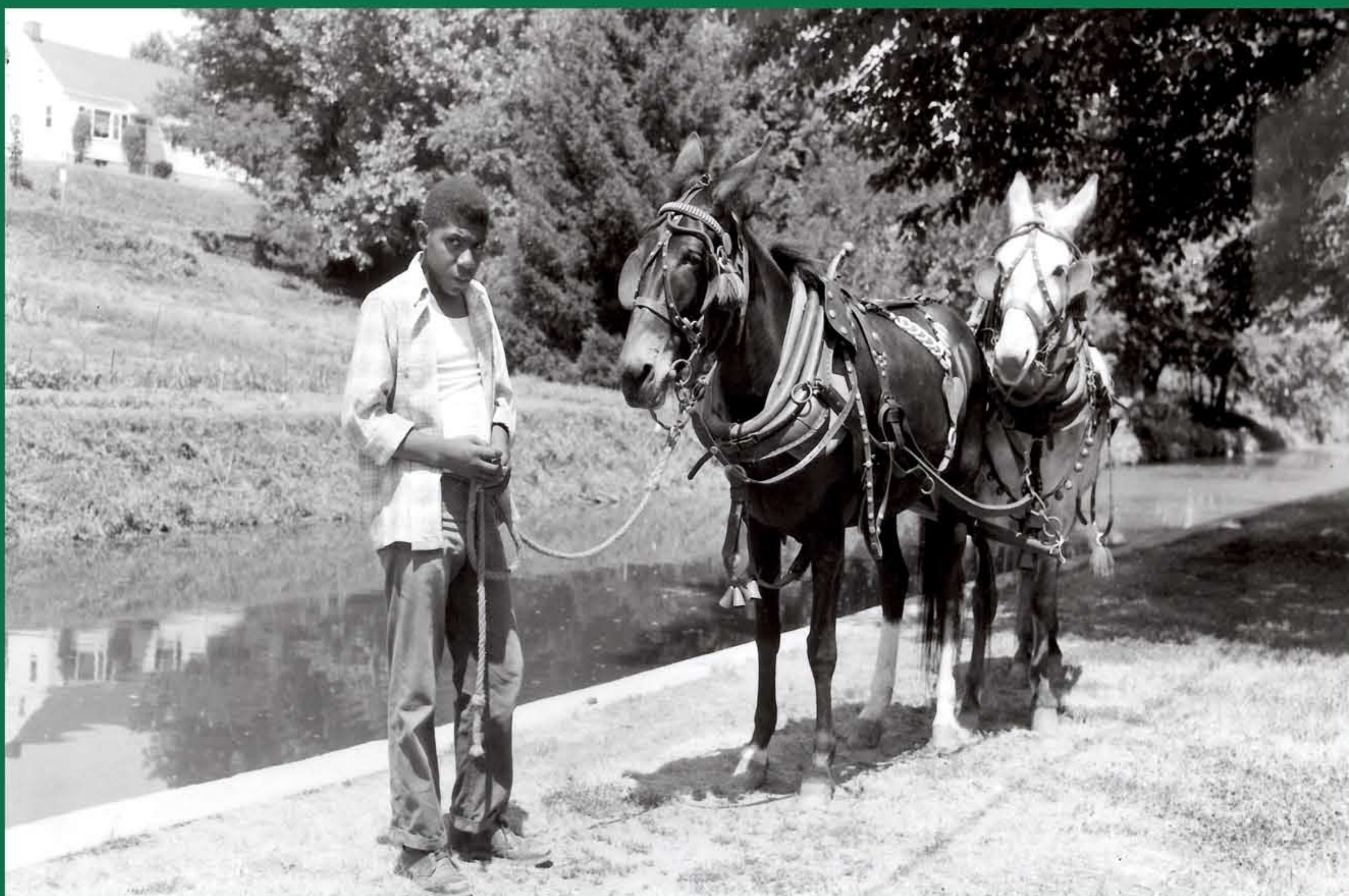
Historic Delaware Canal boat ride.

Delaware Canal, New Hope, Pennsylvania.

Delaware Division Canal, Narrowsville, PA.



Historically, mules were well-suited to work on canals. So, the use of mules on contemporary canal trips gives an authentic historical feel to the experience!



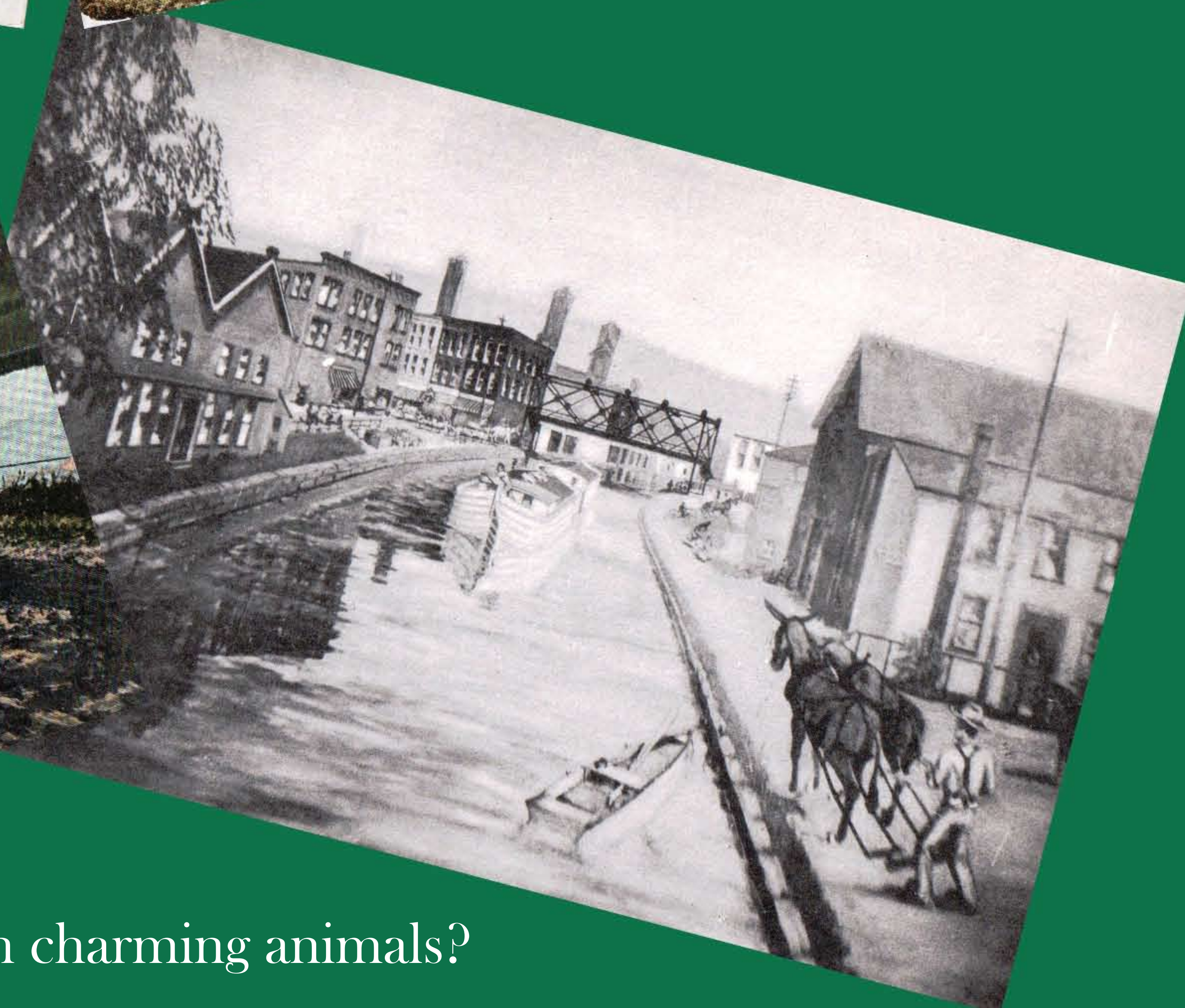
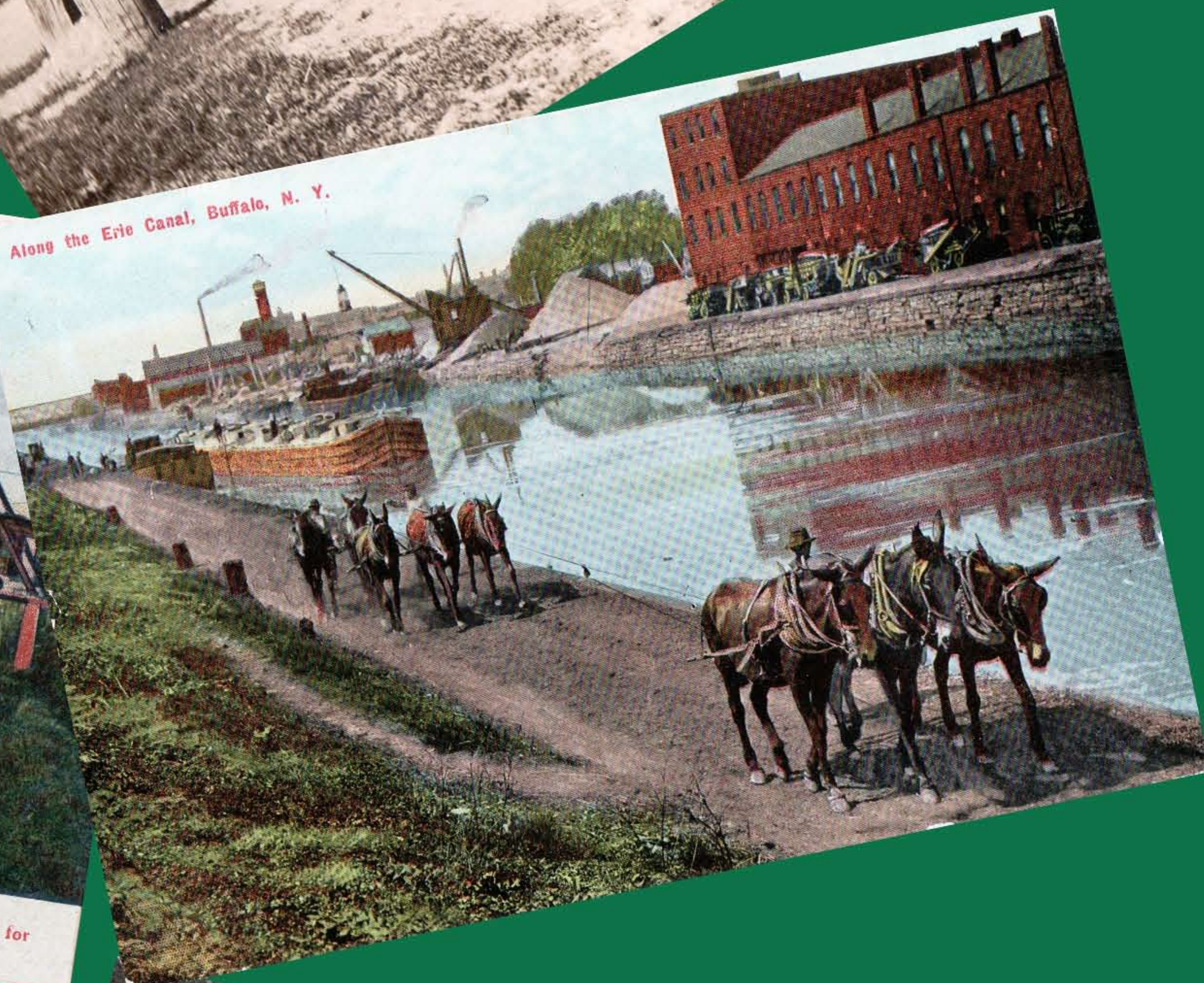
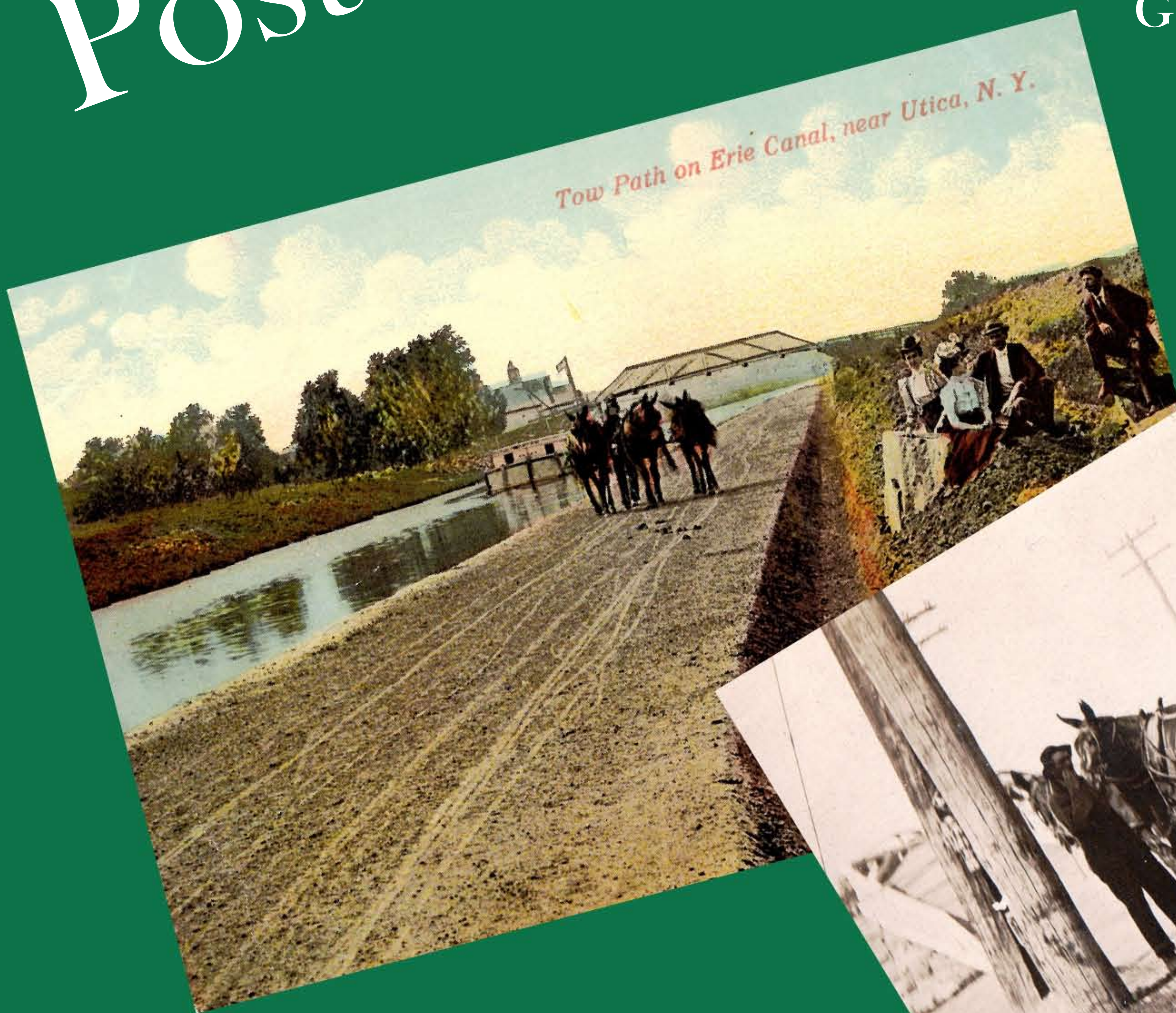
Mule driver Larry with his two mules: Mary (black mule) and Pete (white mule). Delaware Canal, New Hope, PA. Photo taken June 30, 1957.



Capturing the romance of the  
Erie Canal (and its mules)!

# Postcard Mules

Canal images featuring mules were common during the first few decades of the 20th century and especially during the Golden Age of Postcards (1907-1915).



Aren't mules such charming animals?





Northern farmers more commonly used horses or oxen, but mules were the backbone of Southern farming!

# The Mule in Agriculture

Poster from the Resettlement Administration, one of President Franklin Roosevelt's New Deal programs designed to help struggling farmers. Image courtesy of the LOC

Farming was mechanized in the mid-20th century, ending the use of mules.

Harvesting cotton in Dallas, 1905. Image courtesy of the New York Public Library

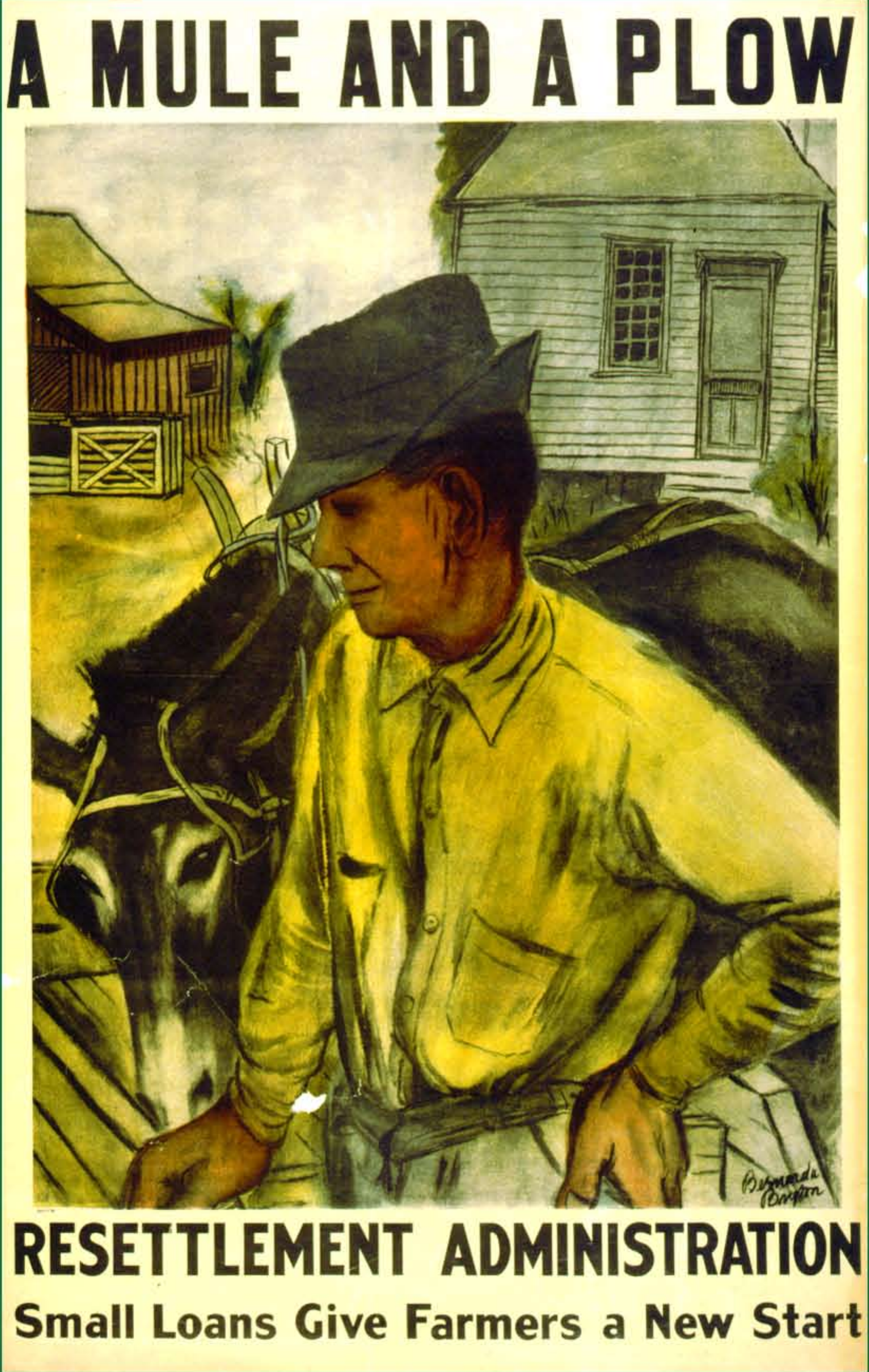


Mules were a major part of the history of agriculture, especially in the American South, where they were used on farms and plantations more often than horses.

Farm mule, Hazlehurst, GA (1941). Image courtesy of the LOC



One Southern farmer with two mules could easily plow 16 acres a day. Mules not only plowed the fields, but they harvested crops and carried the crops to market. They were used to great effect in both tobacco and cotton farming. The use of mules in agriculture is all but over due to the march of progress, and in particular, the use of trucks and tractors instead of animal power.



Mules generally held up better than horses in southern climates. Per the 1900 Census of Agriculture, “the hot, moist climate is quickly fatal to horses when hard worked, while mules bear it with impunity and endure hardship, overwork, and ill usage without great loss... Their hooves are very hard, and are shod either not at all or at infrequent intervals. Their average working life is longer than that of horses.”

1939 cotton harvest in the Mississippi Delta. Image courtesy of NYPL







Mules were a major part of underground mining and the creation of the NYC subway system!

Image courtesy of the New York Public Library

# Mules Underground!

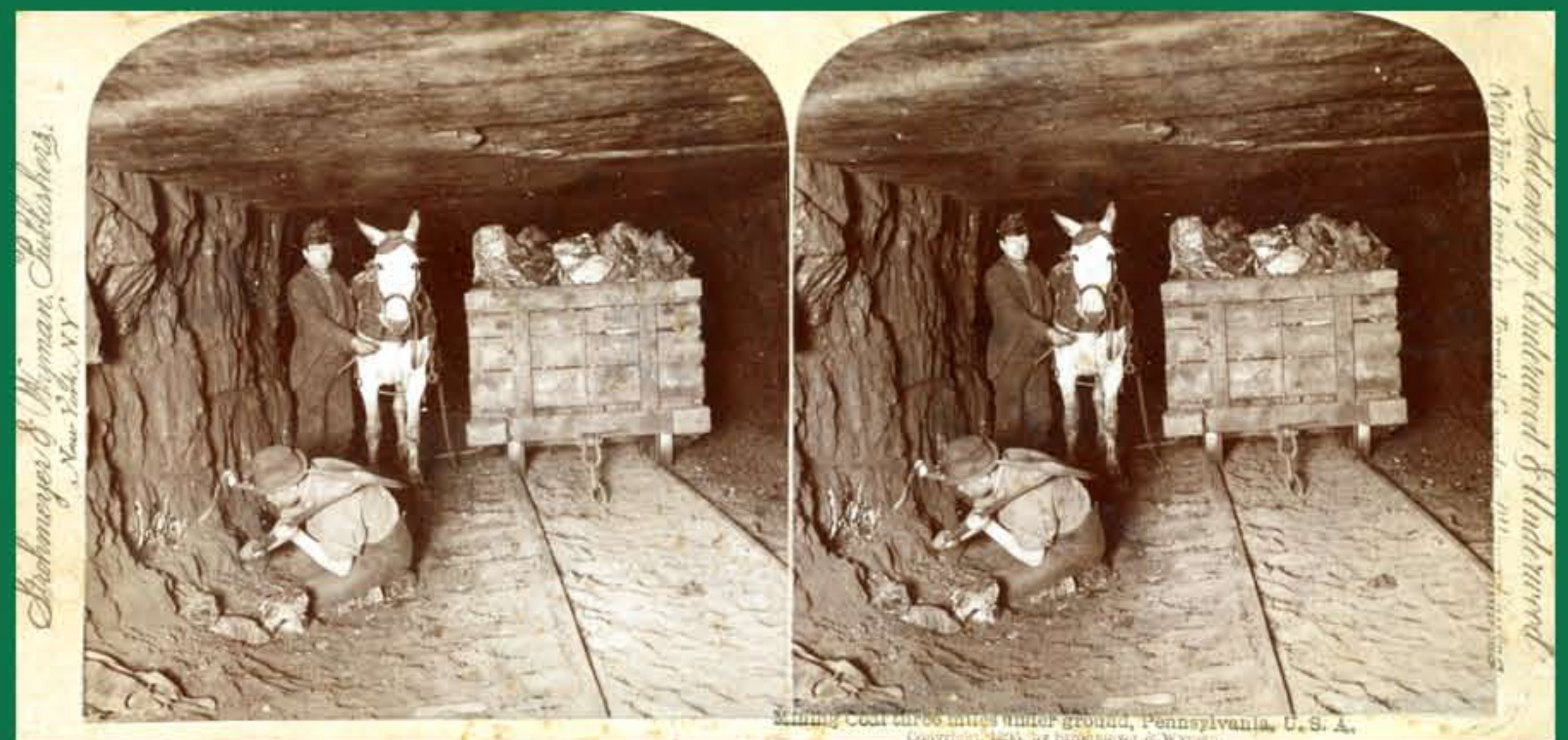
Underground stables, Shenandoah, PA  
Image courtesy of the Library of Congress



American Radiator Mine, PA. Image courtesy of LOC

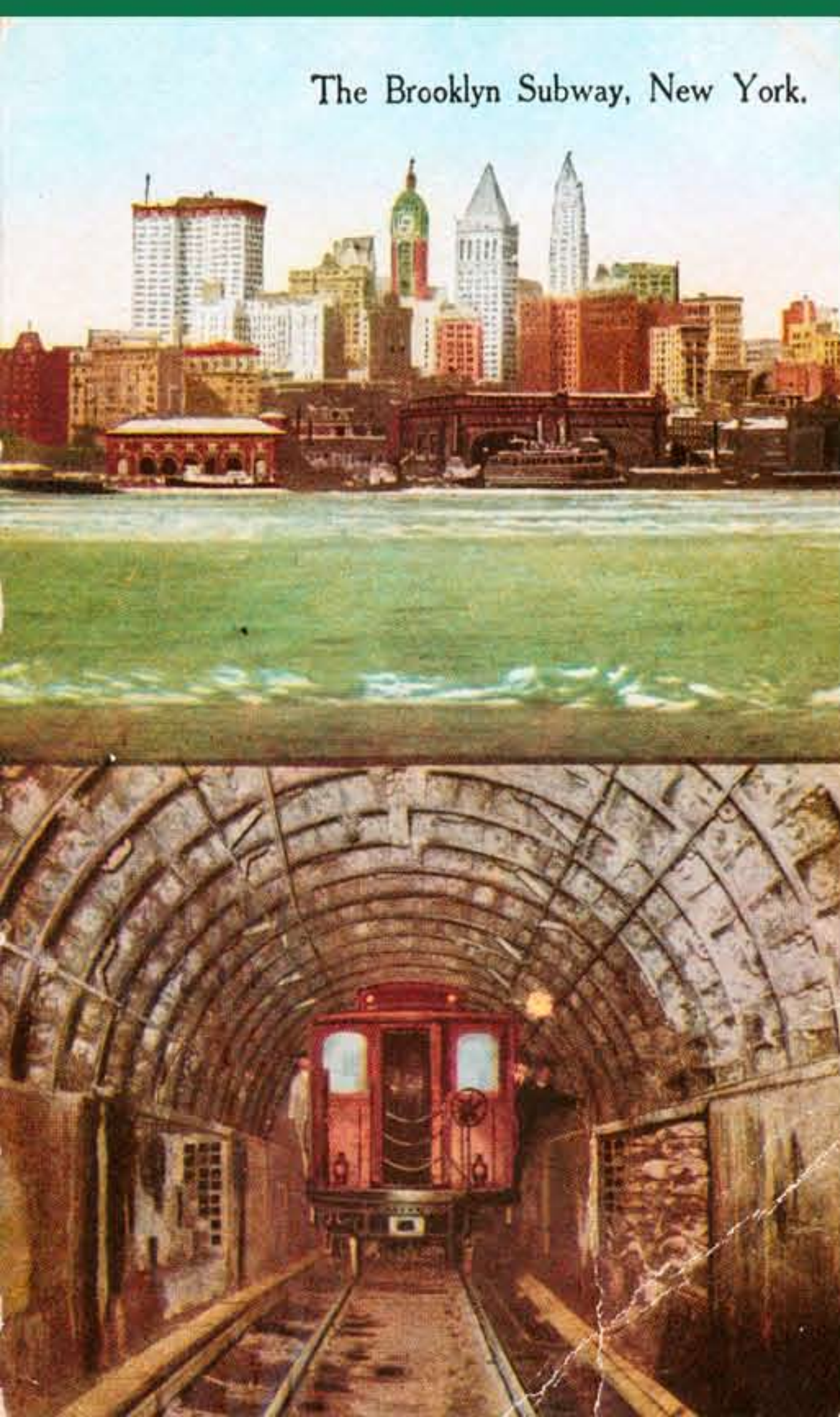


Mules were the backbone of the coal mining industry in states like Illinois, West Virginia, and Pennsylvania in the late 19th and early 20th century. Teenage boys most often worked as mule drivers in the mines; they also cared for the animals. An average four-mule team could haul nearly 500 tons of coal in a 10 hour shift. A six-mule team could pull 25 or more cars. Stables were underground, built within the coal mine itself and mules stayed underground for years at a time! Some of them got summers off, or regular vacations above ground; many of these expressed “mulish glee” at being able to see grass, sun, and blue skies again! The mules’ intelligence came in handy underground. They would listen for the click of the cars behind them and would refuse to move if one too many was added. They were also known to alert the miners to dangers like falling rock or gas. Mining is a dangerous job and men and mules both died in fires, explosions, and cave-ins. Pennsylvania produced the most coal of any state, and at the height of production in 1907, 17,500 mules were used in mining.



PA coal mine, c. 1900. Image courtesy of NYPL

1918 postcard. Courtesy of NYPL



Mules were used in the coal mines until 1965, when a law was passed making it illegal to keep them in underground stables. Mules were also used in salt mines in Kansas and Michigan, along with Western New York; copper mines in Michigan; mineral mines in Arizona; and iron mines in Minnesota.

Mules also worked on the construction of the NYC subway. The mules lived in stalls underground. Some local citizens worried about the mules and called for an SPCA investigation. The SPCA found that the mules were well cared for and their living conditions were comfortable, with fresh air pumped in. The mules were favorites of the tunnel workers and many of them were given nicknames to go with their outsized personalities!



The mule has been the mascot of the U.S. Military Academy at West Point as well as the U.S. Army overall since 1899!

# Mules at War

Army mule at 1925 football game. Image courtesy of the Library of Congress



Mules pulling parade cart in 1918 victory parade. Image courtesy of the New York Historical Society



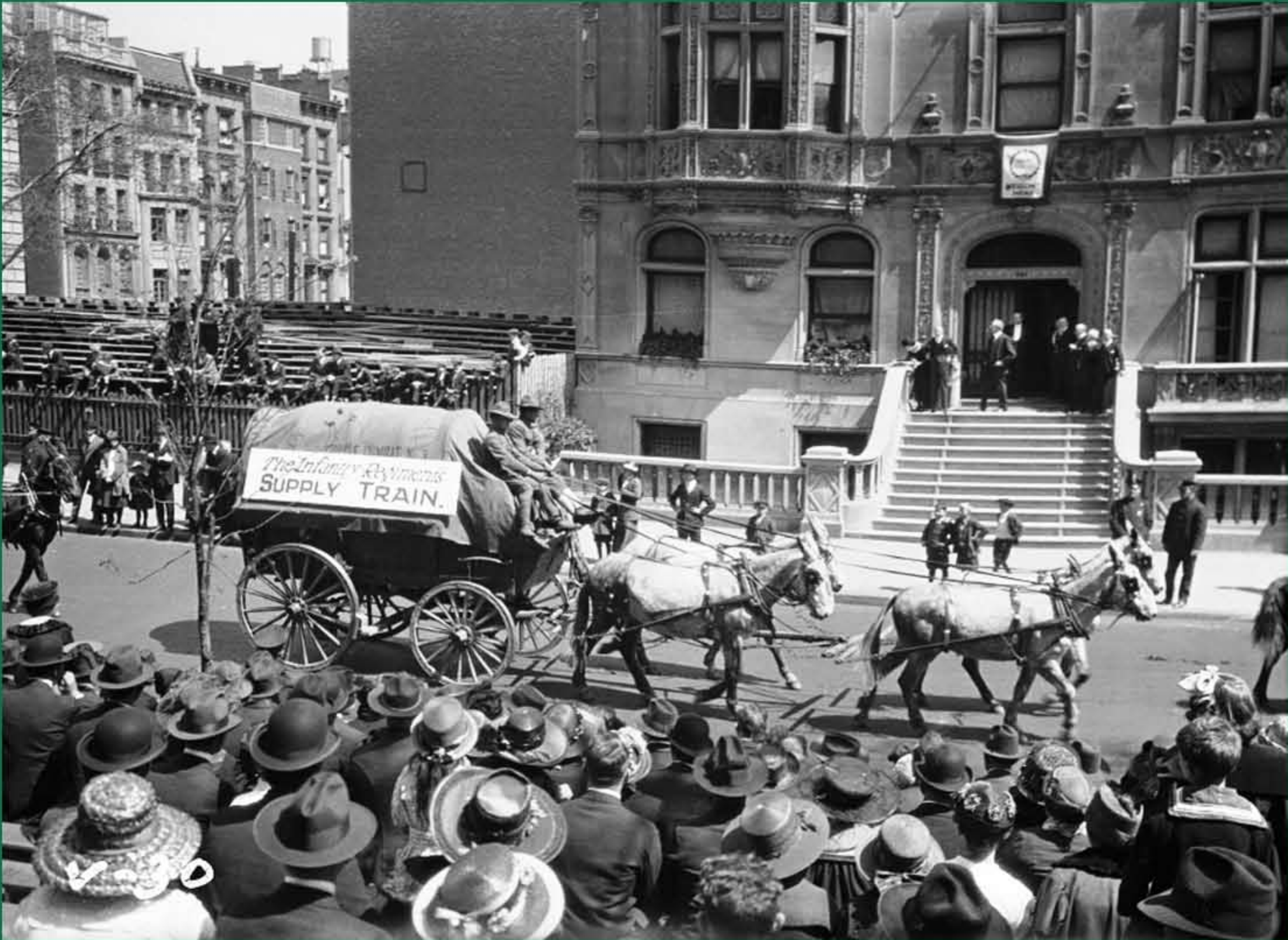
The newly recruited mules were sent on to France, where they were kept in one of five depots on the French coast until they were sent on for active duty. Mules became the backbone of the Army’s logistics. They carried soldiers, supplies, ammo, and guns. After the war, many of them were auctioned off, to French farmers and (unfortunately) to butchers. Movement of troops and supplies was mechanized by WWII, but mules were still used in areas that were inaccessible to four wheels, like mountains and jungles.



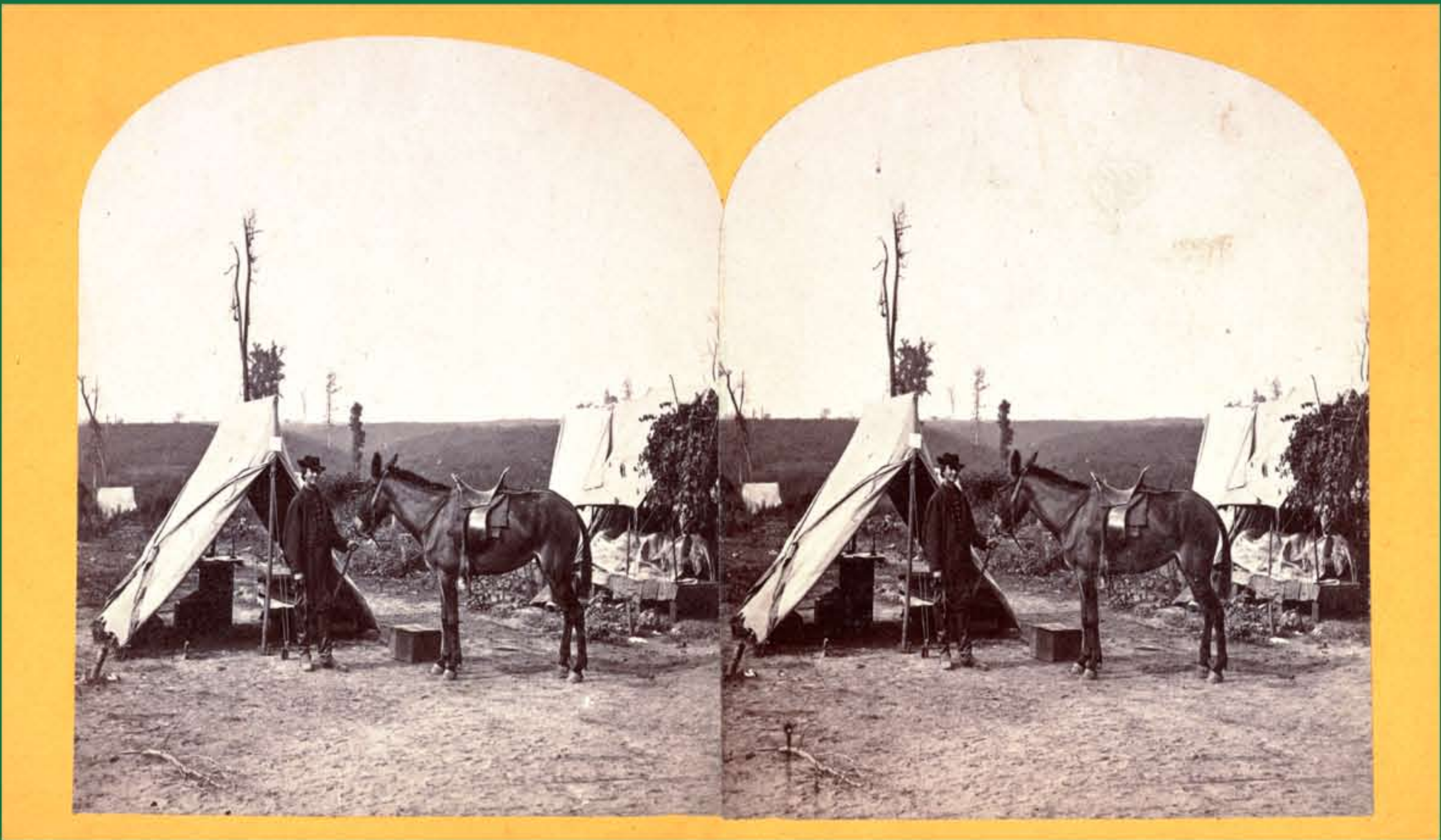
American Expeditionary Forces (AEF) unloading mules at the docks in Bordeaux, France. Image courtesy of the New York Public Library.

Military forces have relied heavily upon the strength of mules in the past. The largest numbers of mules were used in World War I, with American mules playing a large role in the movement of troops and supplies.

The British forces purchased large numbers of these mules, which had been bred in the Midwest and South. They were sent to the East Coast via railroad, and then transported across the Atlantic on ships.



World War I victory parade mules. Image courtesy of the NYHS.



Stereograph image of a soldier from the 134th Regiment Illinois Volunteer Infantry, along with his trusty mule. Image courtesy of LOC.

Earlier in U.S. history, mules had a large role in the Civil War, as well. The mules were used to pull wagons and guns in supply trains for both Union and Confederate forces. During the Maryland campaign in particular, the Union Army used over 10,000 mules for transport. There were a lot of mules in the area, because they pulled boats on the Chesapeake & Ohio (C&O) Canal. The owners of canal mules feared that their mules would be stolen for use in the war effort!





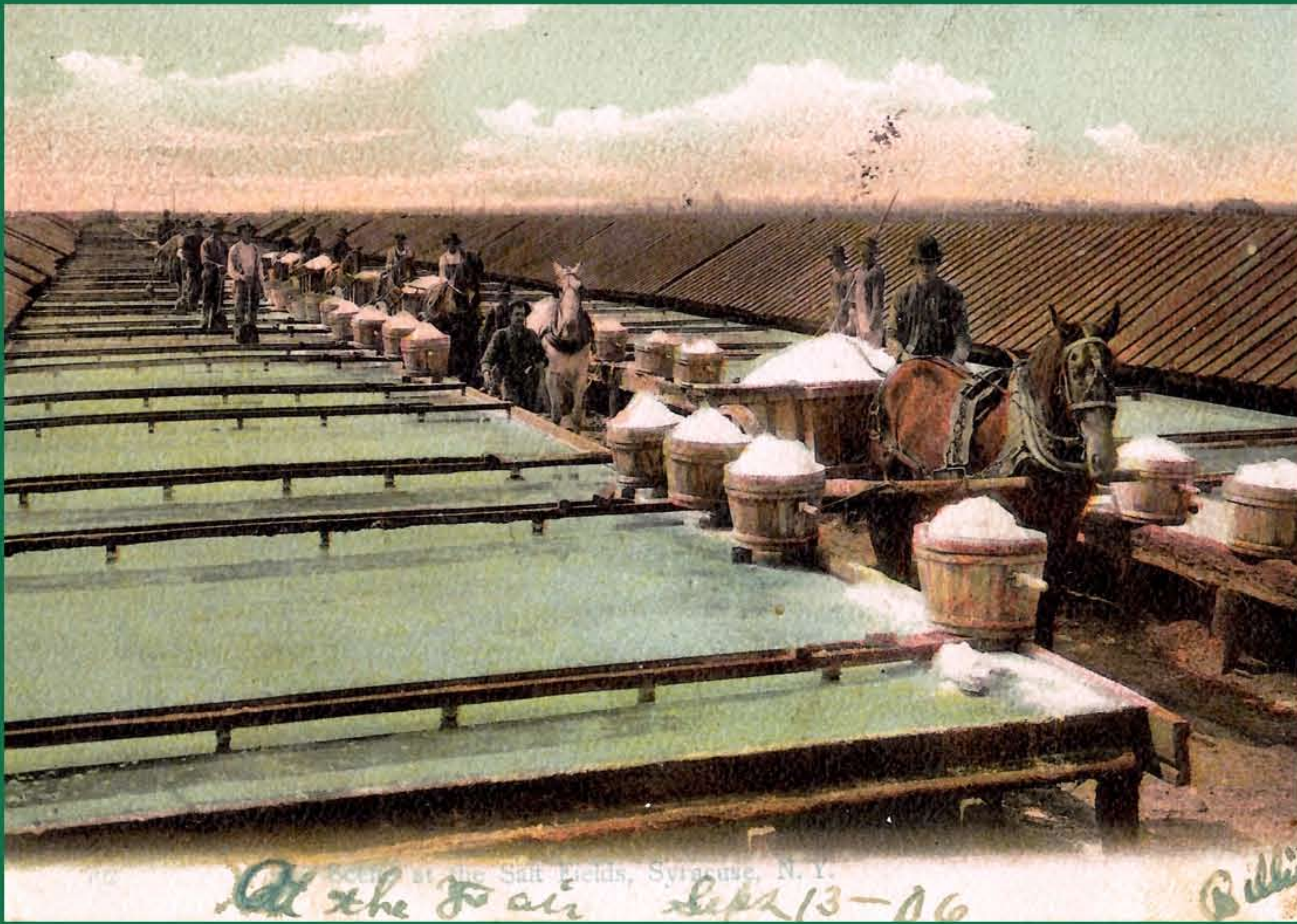
Mules hauling logs in Tennessee, 1936.  
Image courtesy of NYPL

Mules have been helping humans  
work for thousands of years!

# Other Mule Professions

Working mules are  
icons of history.

Mules hauling salt in a Syracuse salt field.



Mule carts unloading schooners in Galveston, Texas in  
1874. Image courtesy of the New York Public Library

In over 3,000 years of mule cultivation  
by humans, mules have been used for  
general labor as well as transportation.  
In the Middle Ages, mule trains were  
the most common method of moving  
goods across country.

Image courtesy of NYPL

Mules were a major part of the American push for  
Westward expansion in the 19th century. Mules  
can carry large amounts of weight and can also live  
on a lower quality of food than horses, making  
them invaluable for life on the move. The mule's  
sure-footedness continues to come in handy for  
Western travelers, as mules are still used by visitors  
to the Grand Canyon other scenic spots.

Image courtesy of the Library of Congress



**20 MULE TEAM  
BORAX**

The hybrid vigor of mules conveys advantages for the  
work of moving people and materials. Mules possess  
agility, strength, and a calm demeanor, along with  
reasoning power and intelligence. They also tolerate  
hot and dry conditions, such as that of the American  
west and southwest, better than horses do.

Borax is a compound used in laundry detergents.  
It was discovered in the California desert. Between  
1883 and 1889, teams of 20 mules hauled 36 ton  
wagons with wheels 7 feet tall across 165 miles of  
desert, from Death Valley to the railroad at  
Mojave, CA. They moved more than 20 million  
pounds of borax through this harsh and  
unforgiving terrain, and eventually became the  
logo for the company selling borax soap.



Mule train with passengers, Mexico 1898. Image courtesy of NYPL



# Mules & Icons of History

Mules have had some famous fans!

Harry S. Truman (image courtesy of the Library of Congress)



Mules were the favorite animal of Harry S. Truman, 33rd President of the United States (served 1945-1953). They're also the official animal of Missouri, Truman's home state. He invited a four mule team from his hometown of Lamar, MO to take part in his 1948 Inaugural Parade in Washington D.C.

Mule (image courtesy of LOC)



Napoleon Bonaparte (image courtesy of the New York Public Library)



James Garfield, the 20th President of the United States, worked as a mule driver on Ohio canals as a boy. He fell into the water 14 times in 4 months. One of his campaign slogans was "From the Towpath to the White House."

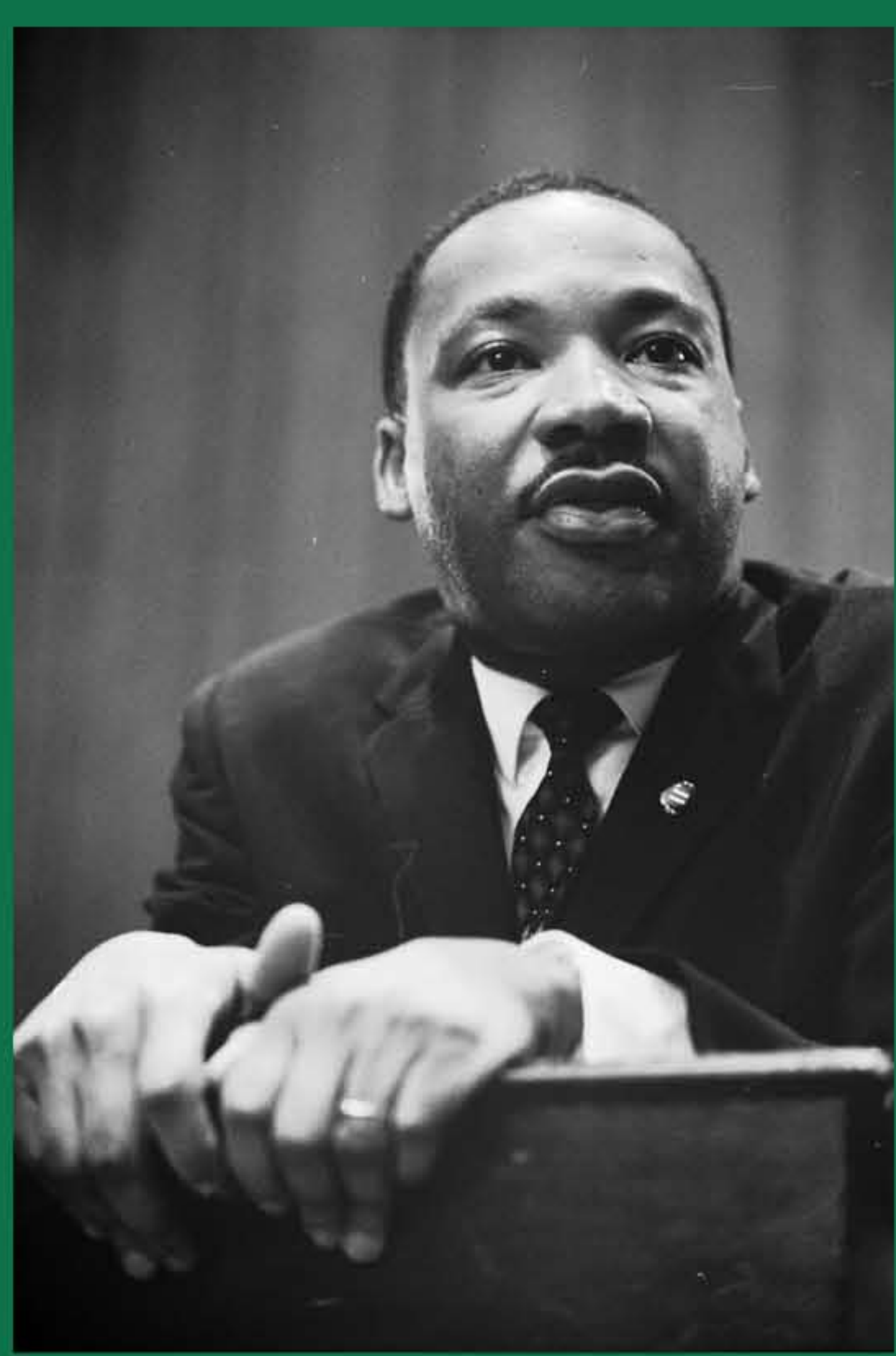
James Garfield (image courtesy of NYPL)



After the Atlanta funeral of American civil rights leader Reverend Martin Luther King Jr., his casket was pulled by mule cart for three miles from Ebenezer Baptist Church to Morehouse College. This symbolized Dr. King's unity with the South and with the people who toiled alongside mules.

Napoleon Bonaparte, Emperor of France (1804-1814; 1815) rode a mule when he famously crossed the Alps. He was not a gifted rider, and the mule (borrowed from a Swiss peasant) was a better choice on rough terrain.

Dr. Martin Luther King Jr. (image courtesy of LOC)



Abraham Lincoln (image courtesy of LOC)

During the Civil War, Confederate Army forces captured forty mules and a U.S. Army general. When he heard the news, President Abraham Lincoln is reported to have said, "I'm sorry to lose those mules."





Image courtesy New York Historical Society

“In the world of mules,  
there are no rules.”

- Ogden Nash

# The Quotable, Notable Mule

“A mule will labor ten years willingly and  
patiently for you, for the privilege of  
kicking you once.” - William Faulkner

“Nothing but ignorance and prejudice could have  
kept the value of this useful animal so long from  
being known to us. But of what are ignorance and  
prejudice not capable?” - 1818 agricultural report

“I would rather have a mule  
I can depend upon than a race  
horse that I can't depend upon.”  
- Malcolm X

“A mule has neither  
pride of ancestry nor  
hope of posterity.”  
- Robert Ingersoll

“The mule is a very  
intelligent animal,  
but to get his attention  
you have to hit him on  
the head with a stick.”  
- L. Frank Baum

“The mule...is as much  
smarter than a horse as  
a raven is smarter than a  
falcon. Neither a raven nor  
a mule will go charging into  
combat just because some  
human tells him to.”  
- Randall Garrett