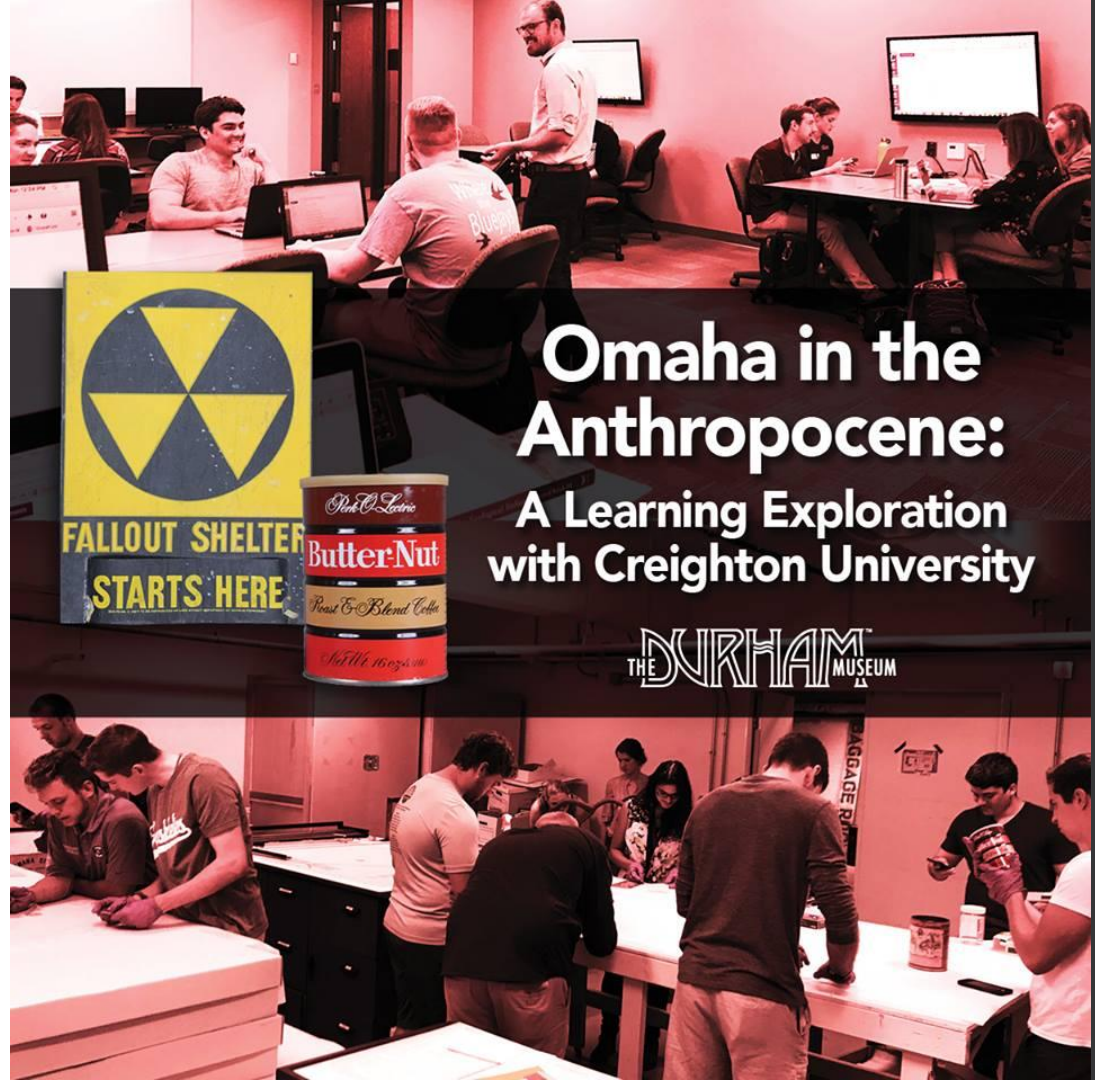


Omaha in the Anthropocene



Introduction

- (History/Environmental Science 488) Global Environmental History: Finding the Anthropocene
- “Omaha in the Anthropocene” will open in March, 2018



Omaha in the Anthropocene: A Learning Exploration with Creighton University

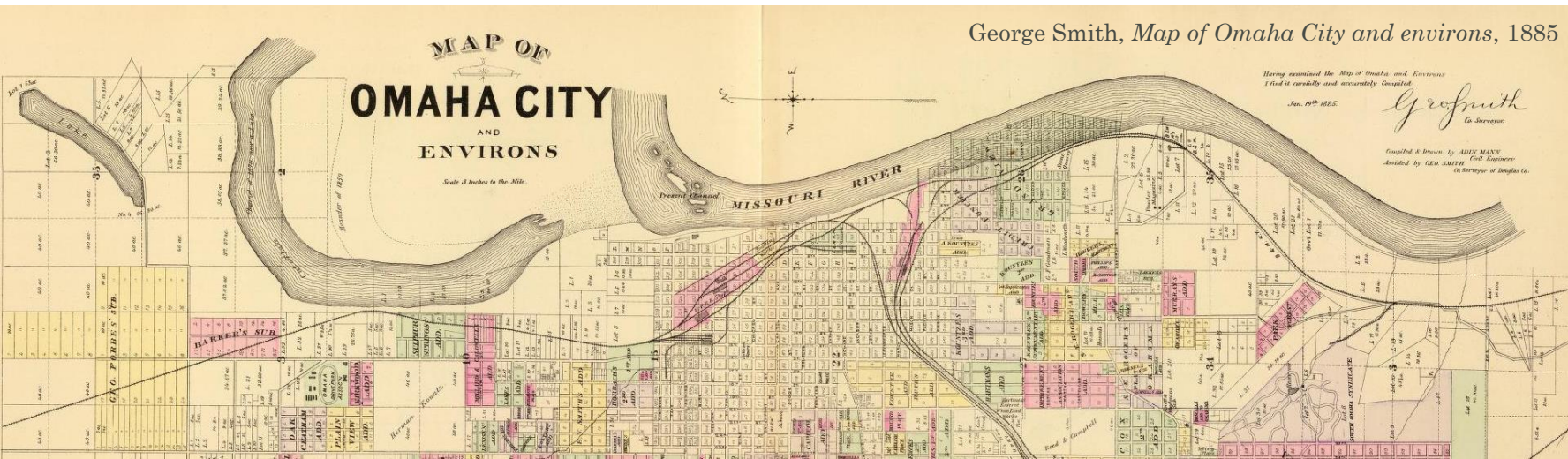
THE DURHAM MUSEUM

Global Environmental History

- Central questions:

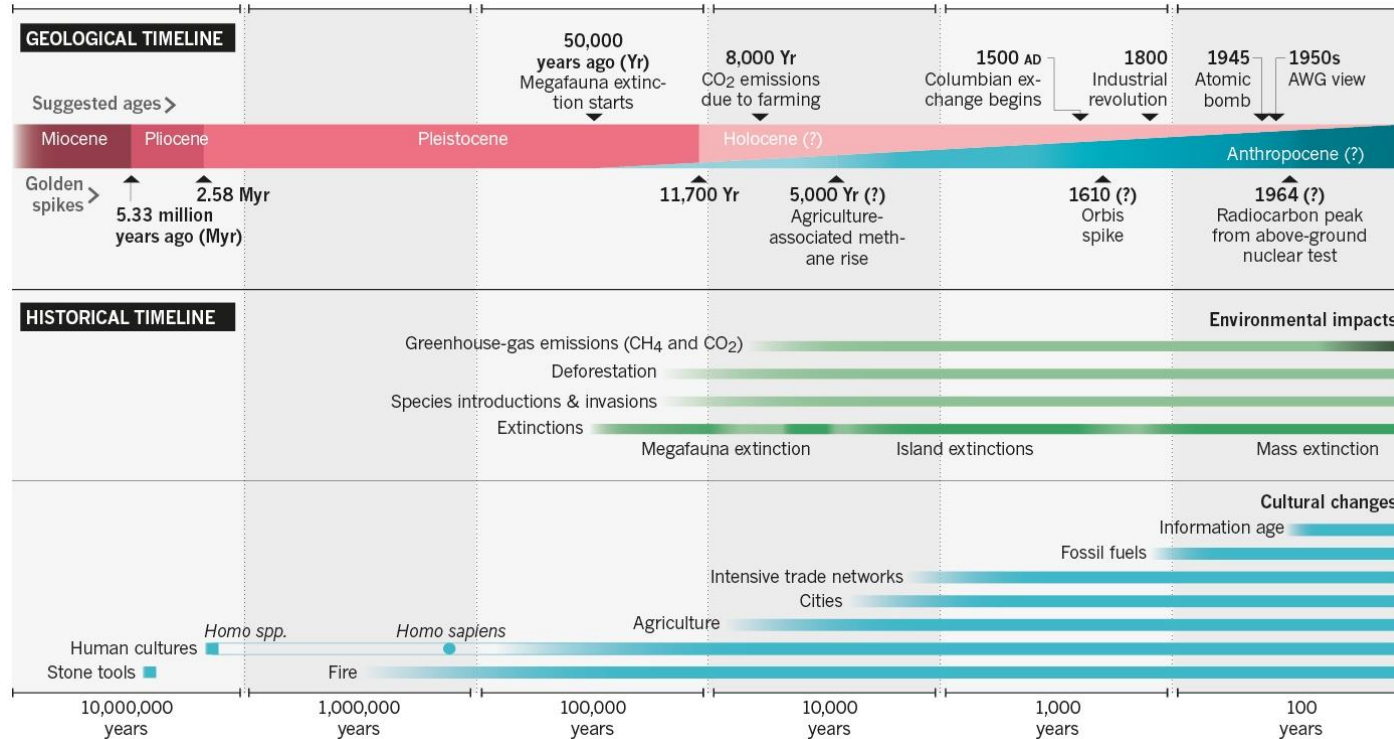
“What has been humanity’s role in changing the face of the earth?”

“How has the environment shaped human history?”



The Anthropocene

- “The Age of the Humans”
- Proposed new geological epoch (International Commission for Stratigraphy)

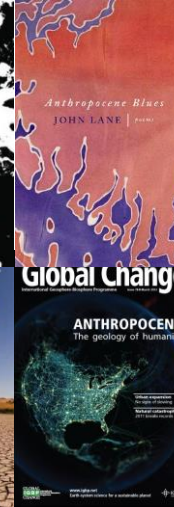
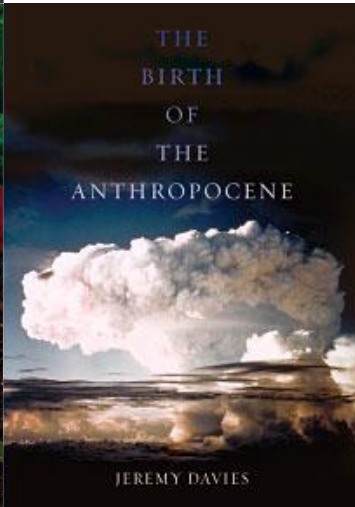
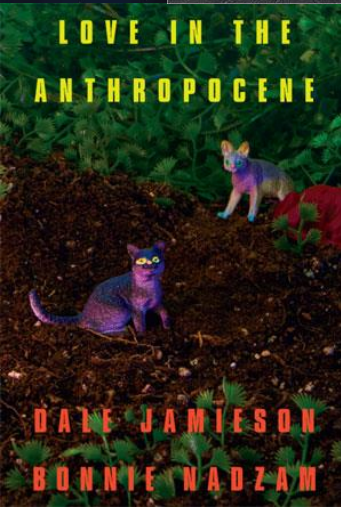




How did this transition occur and why?

Can we locate a moment in time, the proverbial golden spike, that signals the end of one epoch and the beginning a new one?

What would evidence of the Anthropocene look like?



Lithic Tools

Adam Luton (*Biology*)
Will Norskov (*Biology*)

Durham Museum Collection



The History of Lithic Tools

- Widely used for thousands of years to manipulate and process resources
- Aided in the transition from a hunter-gatherer lifestyle to a sedentary farming lifestyle.
- Sustained interactions with the earth have altered humans relationship with the environment through the use of agriculture.

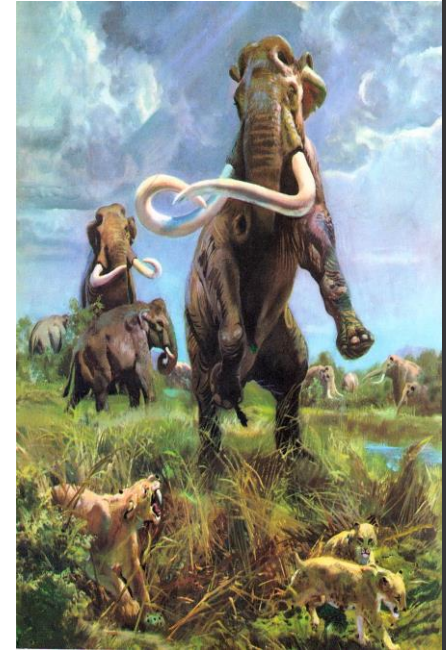


Lithic Tools and Early Humans

- The exact origins of tools unknown
- Nomadic, hunter-gatherer lifestyle was prevalent in early humans
- Diets primarily consisted of megafaunal animals
- Transition to the sedentary farming lifestyle, changes in societies followed



Source: Burian Zdenek
<http://www.evolbiol.ru/burian.htm>



Shaping of the Environment

- Intensive manipulation of the environment occurred to suit the needs of humans.
- The environmental perception of early humans was focused on transformation of the land, extraction of resources and consumption of the extracted resources.
- Early humans lived on the land, not with it

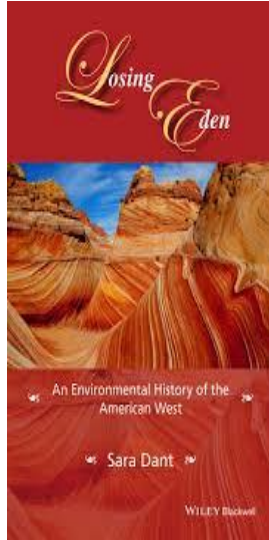


Photo: Adam Luton



Photo: Will Norskov

Spanish Reales

Ian Reuter (*Biology*)

Dakota Wagner (*Environmental Science*)

Byron Reed Collection
Durham Museum



1460

1480

1500

1510

1530

1550

1570

Globalization of Capital

1590

1620

1640

1660

1680

1700

1710

1730

1750

1770

1790

1820

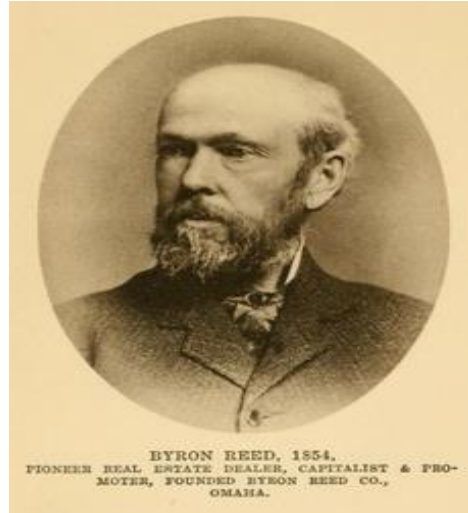
1840

Byron Reed's Spanish Silver Reales



1799 Spanish silver Reales:
Obverse

Source: Ancient and Historical Coins



Byron Reed: Omaha's
first real estate dealer
Source: Internet Archive Library; Nebraskans 1854-1904



1799 Spanish silver Reales:
Reverse

Source: Ancient and Historical Coins

Cerro Rico and Global Silver



Cerro Rico amid Modern Day Potosi: Devoid of wildlife, the silver mountain remains a chilling reminder of the ecological consequences that accompany production driven commodity frontiers.

Source: Al Jazeera America

Time Period	Annual Production	Total Production
1493-1499	Est. 10 million ounces	0.06B
1500-1600	Est. 16 million ounces	1.60B
1601-1800	Est. 20 million ounces	3.98B
1801-1875	30 million ounces	2.25B
1876-1899	120 million ounces	2.88B
Total		10.77B

Global Silver Production: Note the dramatic increase in production beginning in the 1500's. The majority of the silver mined from 1500-1800 was minted into Spanish Reales.⁴

Source: Summarized Data of Silver Production by Charles Merrill

The American Western Front



Agricultural commodification of the 19th century American western front's natural resources

Source: The British Museum



Omaha Railroads, Early 20th Century: Omaha's lands were altered with the coming of industry and railroads.

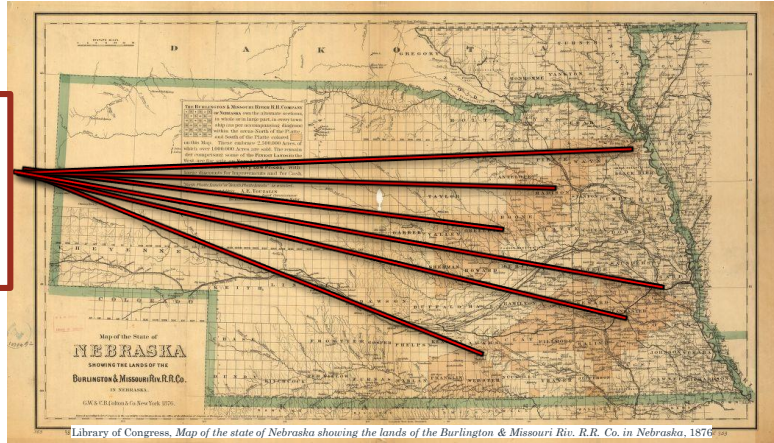
Source: Omaha World Herald

John Brennan (*Environmental Science, Latin*)
Devika Prasanth (*Biology, Biomedical Physics*)

[illegible]

Omaha as an Early Railroad City

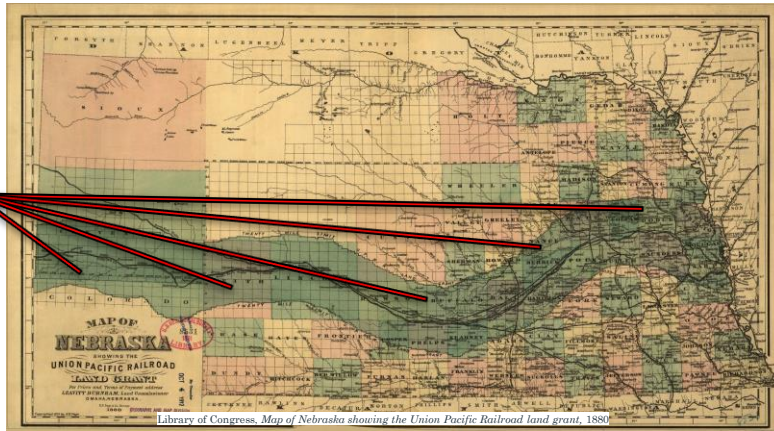
Map of Burlington Land Grants



Library of Congress, Map of the state of Nebraska showing the lands of the Burlington & Missouri Riv. R.R. Co. in Nebraska, 1876

Acquired land throughout Nebraska, and intended to create an intricate branching railroad.

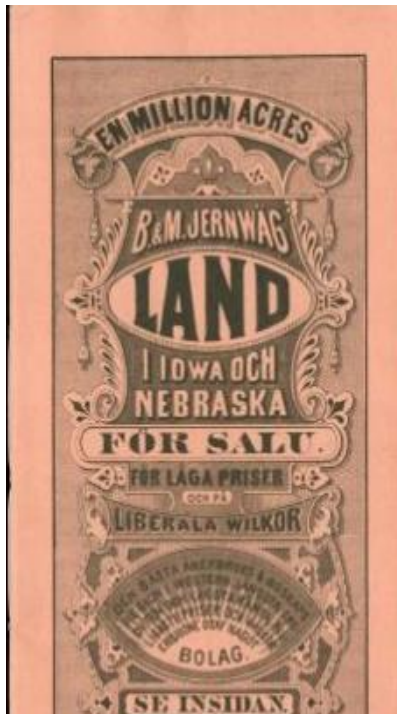
Map of Union Pacific Land Grants



Library of Congress, Map of Nebraska showing the Union Pacific Railroad land grant, 1880

Acquired land with the intent to cut through Nebraska and further into the West.

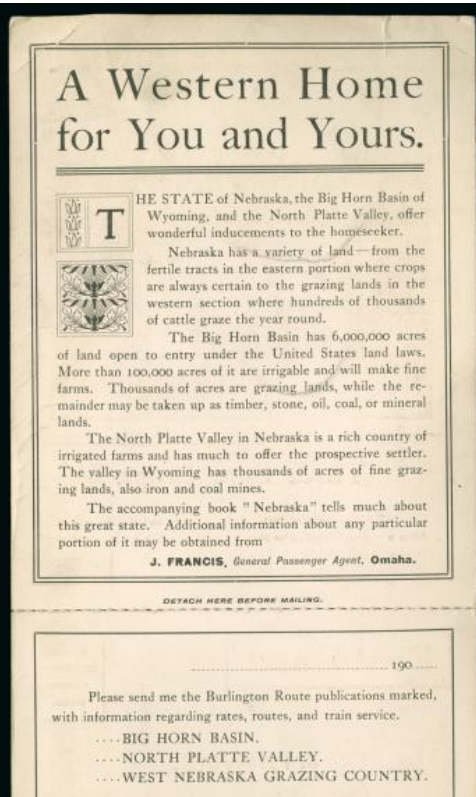
Advertisements Encouraging Westward Travel



Source: Environment & Society Portal, CB&Q broadside poster "En Million Acres Nebraska Land" brochure (in Swedish) (1876)



Source: Environment & Society Portal, CB&Q broadside poster "The Last Excursion! Through Southern Iowa" (1876)



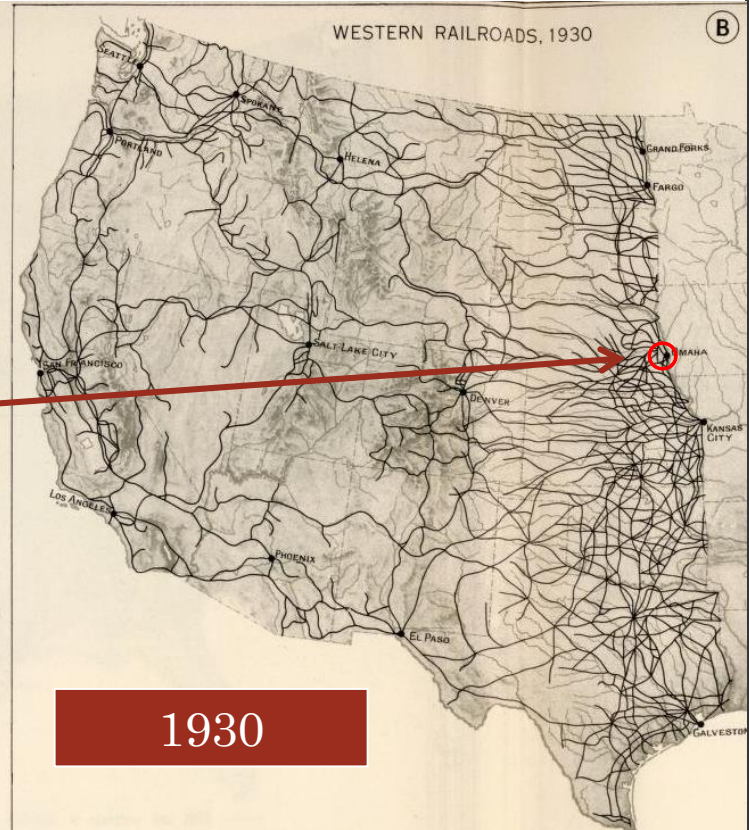
Source: Environment & Society Portal,
Advertisement with postcard: "A Western
Home for You and Yours" (1900)

Railroads & the Second Industrial Revolution

Railroad growth from 1880 to 1930.

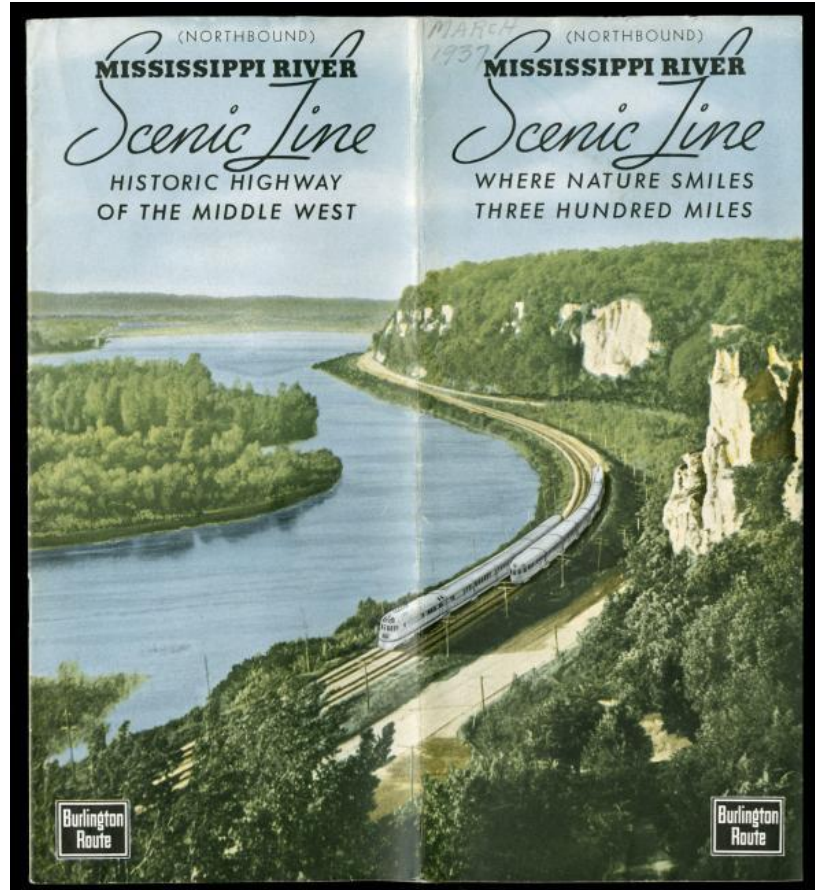
Notice how Omaha became the nexus of many railroads traveling further west.

David Rumsey Map Collection, Plate 141. *Transportation. Railroads, 1880 - 1914.*



Advertising the Beauty of Nature

- 20th century: tourism becomes more important
- Burlington used Exposition Flyer trains mainly for scenic routes



"Where nature smiles three hundred miles"

Environment & Society Portal, CB&Q brochure for the Mississippi River Scenic Line, "Where Nature Smiles Three Hundred Miles" (1937)

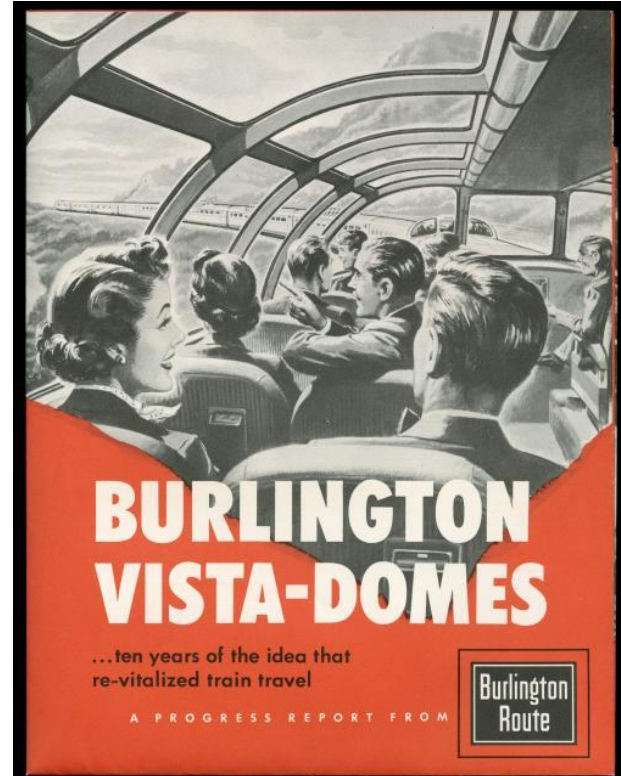
Innovation for Tourism



- Tourism accommodations on Zephyr lines:
 - Vista domes
 - Air conditioning
- Trains no longer popular by 1950s

Newberry Collection, "Burlington Zephyr debut," 1934

Environment & Society Portal, CB&Q brochure, "Burlington Vista-Domes ...ten years of the idea that revitalized train travel" (1955)



Anthropocene & Global Context

- Made time a resource by introducing structure
 - The train timetable established when people and cargo would arrive and depart.
 - This provided a structure for people to manage time
 - As railroads expanded they also brought this system of time with them.
 - The speed and convenience of railroad was also unrivaled at the time, it introduced a state of mind where people were no longer intimidated by large distances.
- New environments were opened up for productive and leisurely consumption



Transcontinental Telegraph

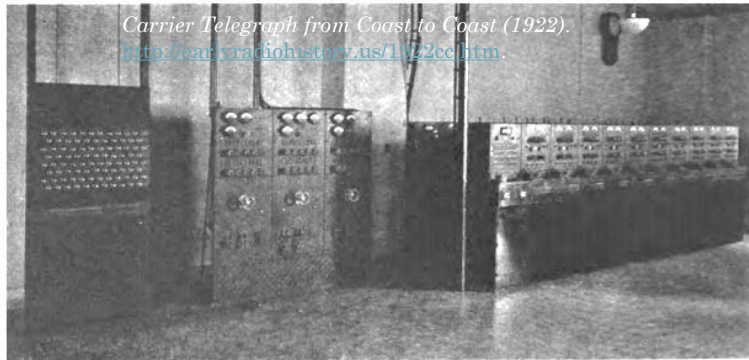
Lindzey Sanchez (*Biology*)
Kassidy Smith (*Spanish*)



Creighton University Archives

Significance of the Telegraph

- Telecommunication revolution
- Second Industrial Revolution
- Environmental consequences



Carrier telegraph terminal equipment at Omaha, showing the general arrangement of terminal and power supply panels

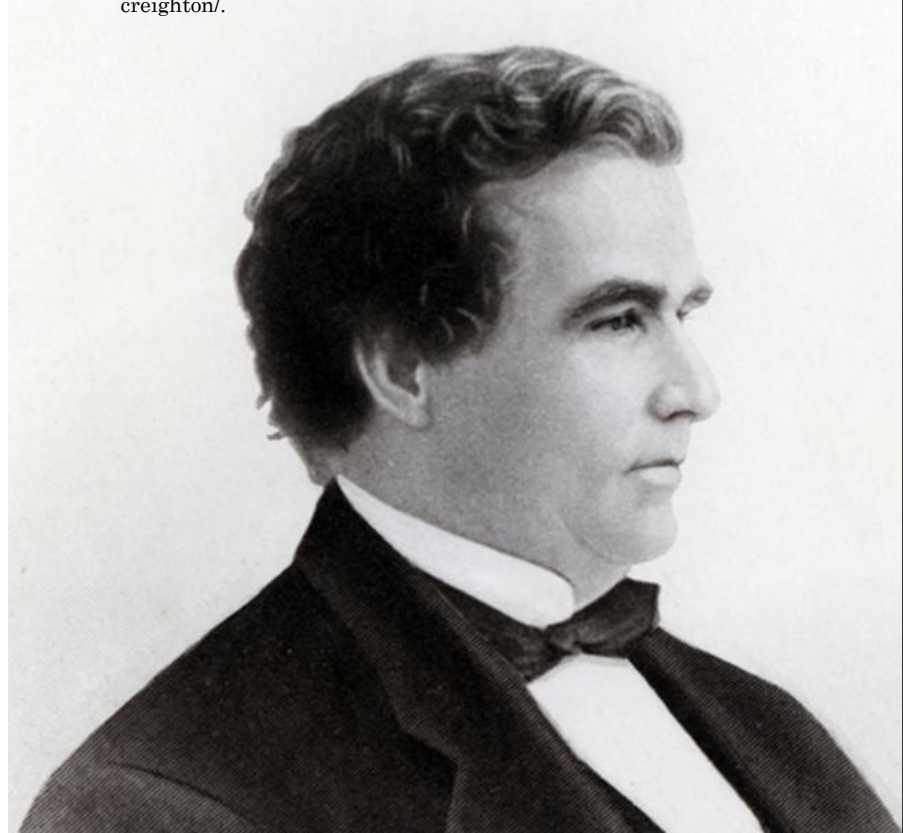


Creighton University Archives

Local Ties

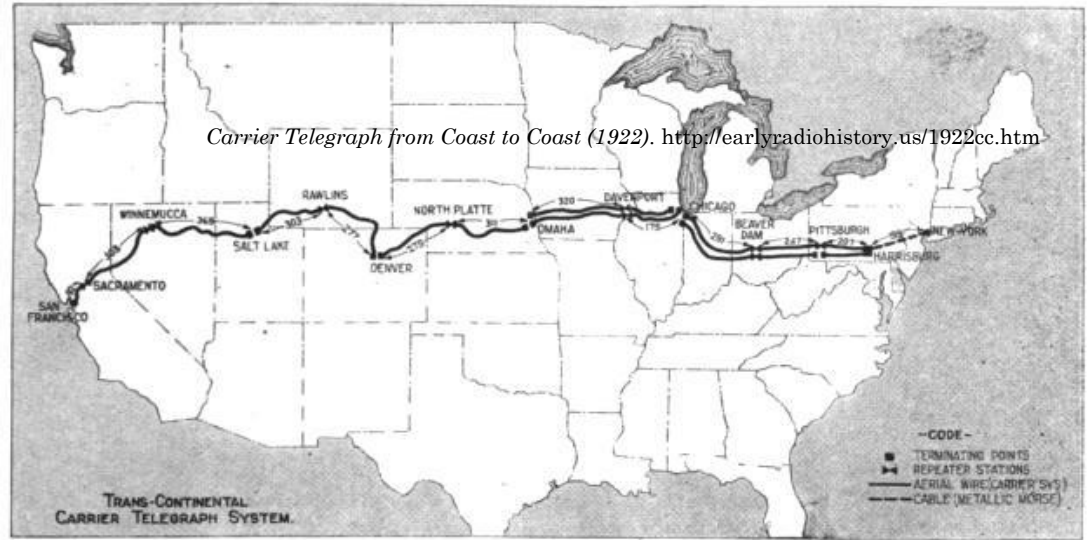
- 1856: Western Union began surveying the west for the transcontinental telegraph
- Telegraph construction caught attention of Edward Creighton
- Creighton University was founded by money Edward earned from the telegraph

“Edward Creighton.” *Nebraska Education on Location*, 8 July 2014,
<http://www.nebraskaeducationonlocation.org/nebraska-notables/edward-creighton/>.



Modernized Business Practices

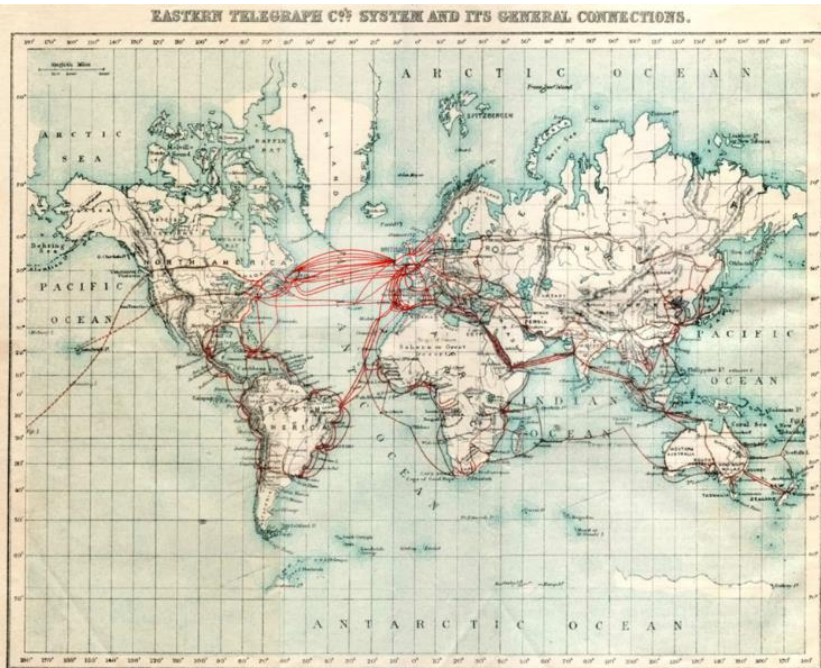
- Increased connectedness
- Businesses could negotiate on a national and global level
- Reducing communication time increased rate at which capital could circulate and accumulate



*Route of the cross-country carrier telegraph system, opened for commercial service
January 23, 1922*

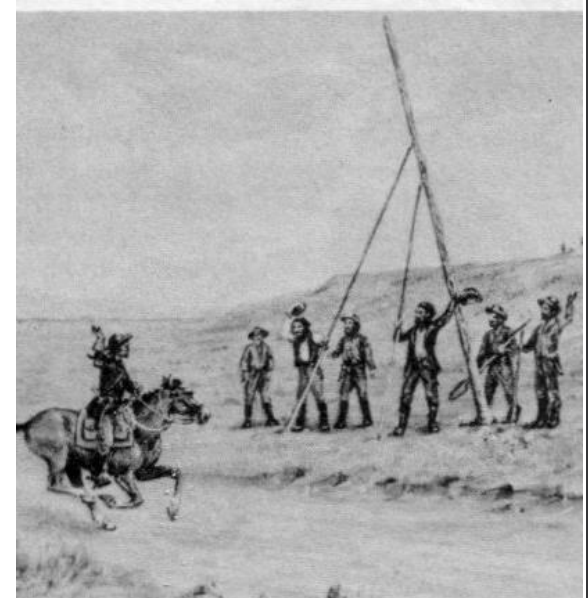
Global Scale & The Anthropocene

- New markets
- Global telecommunications
- Rapid transformation of environments



Unknown. English: *The Eastern Telegraph Co.: System and Its General Connections. Chart of Submarine Telegraph Cable Routes, Showing the Global Reach of Telecommunications at the Beginning of the 20th Century.* 1901.

ent: The History of the Telegraph
United States, 1832-1866



"Building of the Transcontinental Telegraph"
A Painting by W. H. Jackson

Streetcar Tokens

Mary Eva McClure (*Computer Science and Informatics*)

Ryan Leuty (*Biology*)

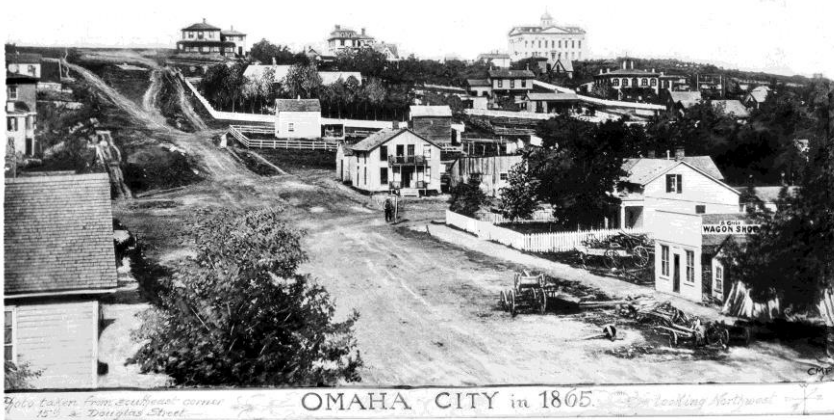
Durham Museum Collection



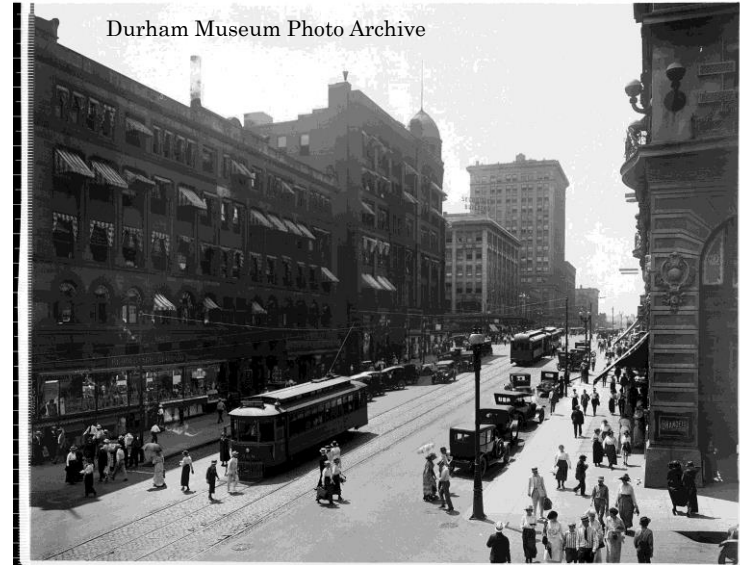
From Walking to Driving

- Cities in the 1800s were small in size
- Walking was the form of transportation
- Modern Commutes much longer

Durham Museum Photo Archive



15th and Douglas, 1865



16th and Douglas, 1919

Urban Sprawl

- 1890-1920 Electric Streetcars takeover urban areas
- Chicago streetcar popularity and “Streetcar Suburbs”



Streetcar in Downtown Omaha

Omaha & Council Bluffs Railway & Bridge Company

- Electric Streetcar system
 - Omaha one of the first cities to introduce the electric streetcar
 - The value of streetcar tokens
- Decline of the streetcar
 - Problems with streetcar companies
 - Automobile usage increasing – 1950's



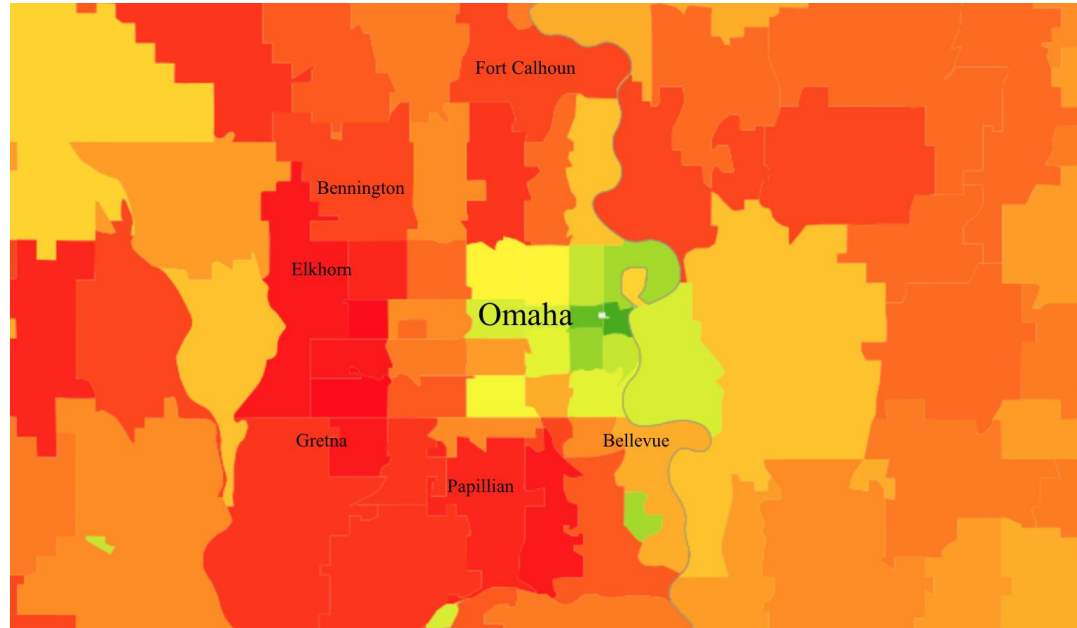
Interior of streetcar damaged in 1935 strikes

Durham Museum Collection



Carbon Emissions

- California Berkeley Study (2013)
- Highest levels of carbon footprint are located in suburban areas
- Over 25% of Greenhouse Gas Emissions are due to Transportation (EPA)



Jones, Christopher and Kammen, Daniel. "Spatial Distribution of U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density," *Environmental Science and Technology* 48, no. 2 (2014).

Modern Changes

- Changing role of streetcars in modern cities
- New potential role in reducing transportation CO₂ emissions



Proposed Omaha Streetcar Route
Pascale, Jordan. "Decades after the idea, Omaha streetcar proposal edges closer to reality."
June 22, 2015. Accessed November 20, 2017. doi:10.17161/kwpl.1808.3898.

ASARCO Lead Refinery

Annie Klein (*Economics*)

Jenna Mucci (*Biology, Environmental Science*)

Durham Museum
Photo Archive

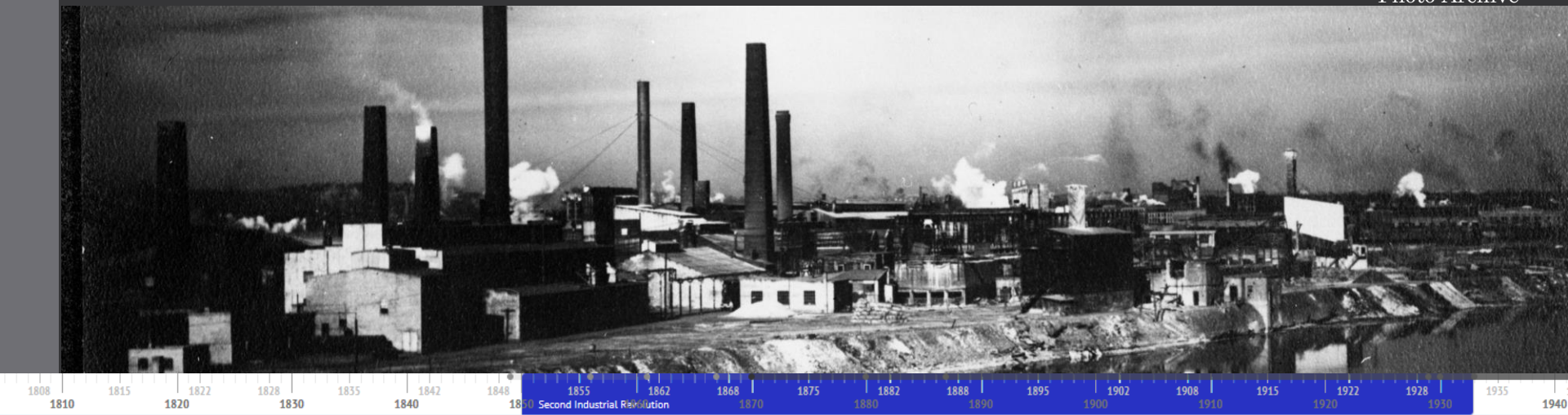




Photo: "Lewis and Clark Landing." Visit



Omaha in the Second Industrial Revolution

“Nebraska was in its infancy when the Omaha Smelting Company was founded in 1870 as a smelter of gold and lead ores. The smelting industry prospered for Omaha was ideally situated at a rail transportation gateway to the booming mining area in the west”

–“Nebraska and ASARCO” *Omaha World-Herald* (1967)



Lead: Uses and Dangers

Most Common Lead Uses

Leaded gasoline, batteries, paints,
plumbing pipes

Lead Poisoning

Impacts central nervous system
Measured blood lead levels

Major threat to children

Permanent brain damage, paralysis,
death



Photo: "Lead poisoning: What everyone needs to know." Harvard Health Blog.

ASARCO in Omaha: A Brief History

1870-Plant established along Missouri River by Omaha Smelting Company

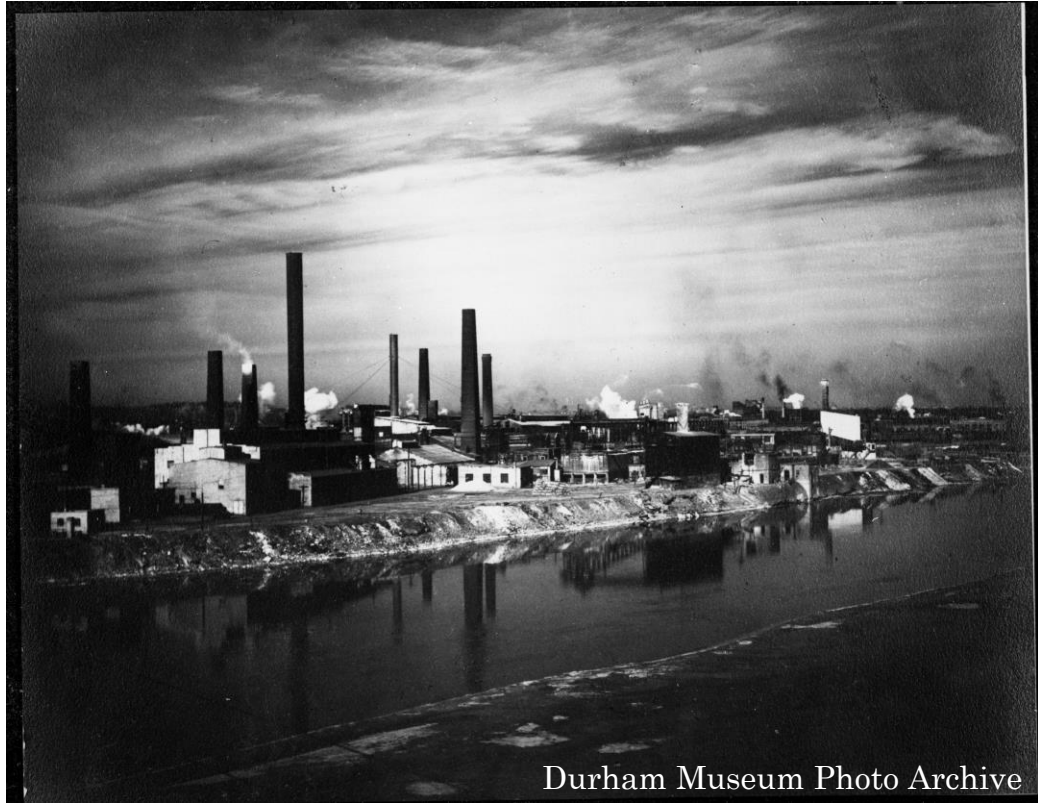
1899-Multiple companies consolidate and form ASARCO, Omaha plant included

1971-Suit filed against ASARCO for air pollution (OSHA)

1994-Civil suit filed, water pollution

1997-Plant closes

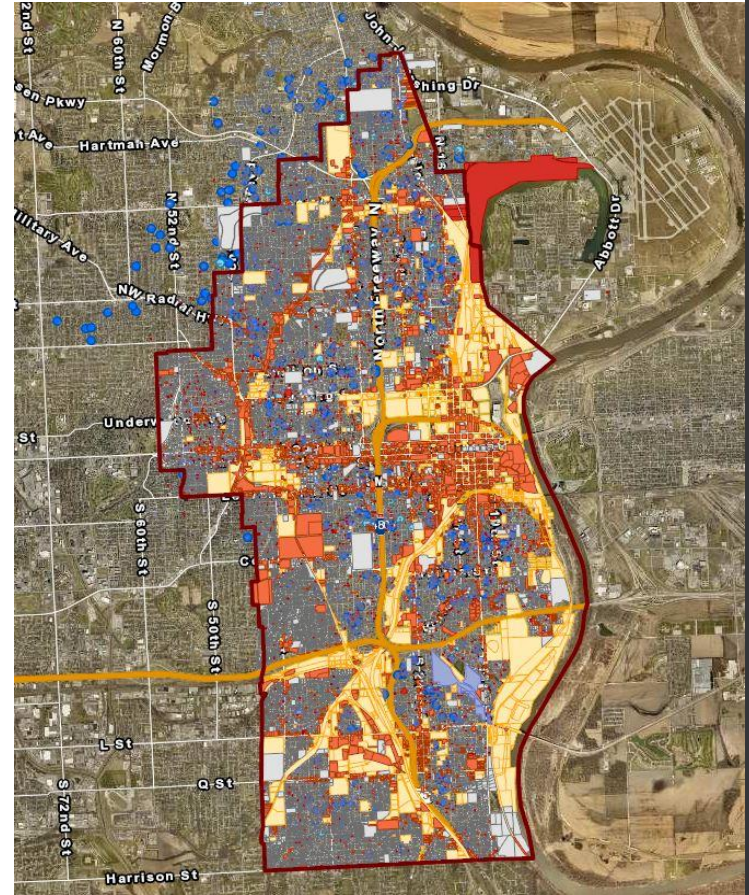
2004-establishment of superfund



Durham Museum Photo Archive

Lead's Local & Global Impact

- Superfund site declaration, 2004
- EPA (Environmental Protection Agency)
- Impacts
 - Omaha (see map)
 - Worldwide



City of Omaha. “Omaha Lead Registry.” 2017



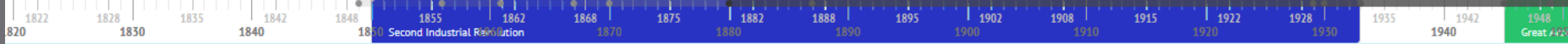
"Lewis and Clark Landing." Visit Nebraska.

North American Bison

Chelsey Dizon (*Exercise Science, Pre-Physical Therapy*)

Kevin Vincent (*Exercise Science, Pre-Physical Therapy*)

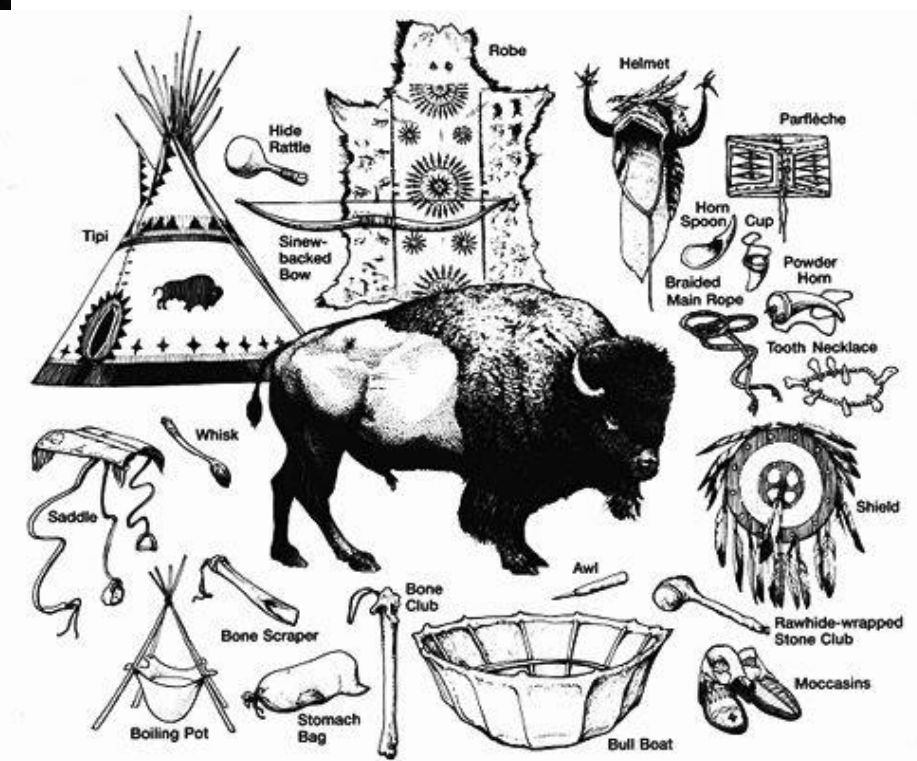
Durham Museum Collection



Bison in the North American Ecosystem

- Wallowing
 - Codependency relationship
 - Depressions allow for new plant growth
 - Bison get relief from heat and insects
- Nomadic grazing
 - Prevents localized overconsumption of grass
- Urine
 - Nutrient recycling





-
- Tipi
- Hide Rattle
- Sinew-backed Bow
- Robe
- Helmet
- Parfleche
- Horn Spoon
- Cup
- Powder Horn
- Braided Main Rope
- Tooth Necklace
- Shield
- Rawhide-wrapped Stone Club
- Moccasins
- Bull Boat
- Bone Club
- Bone Scraper
- Stomach Bag
- Boiling Pot
- Saddle
- Whisk
- Awl

thecanadianencyclopedia.ca, “Buffalo Hunt”, n.d.

Westward Expansion and Fall of Bison

- Hides were used for rugs and coats
- Bones were used for bone meal
- Hunting bison undermined Native American society
- Bison were a hindrance to railroad construction



Montanapbs.org, "Facing the Storm:
Story of the American Bison
Pressroom", n.d.

nmaahc.si.edu, "Buffalo Soldiers
Legend and Legacy", n.d.



Bison Recovery

- Bison-hybrid cattle
- Nebraska man raising organic bison
 - Nebraska is the second highest bison producer in the nation
- Rewilding is seen across the globe

Omaha World-Herald, "This is the last frontier": At a 5,000-acre organic ranch in Nebraska's Sand Hills, the buffalo still roam", 2017

Icr.org, "Cattle-Bison Hybrid Stomps On Evolutionary Expectations", 2016



Future of the Bison



Butter-Nut Coffee

Trevor Schlecht (*History, International Relations*)

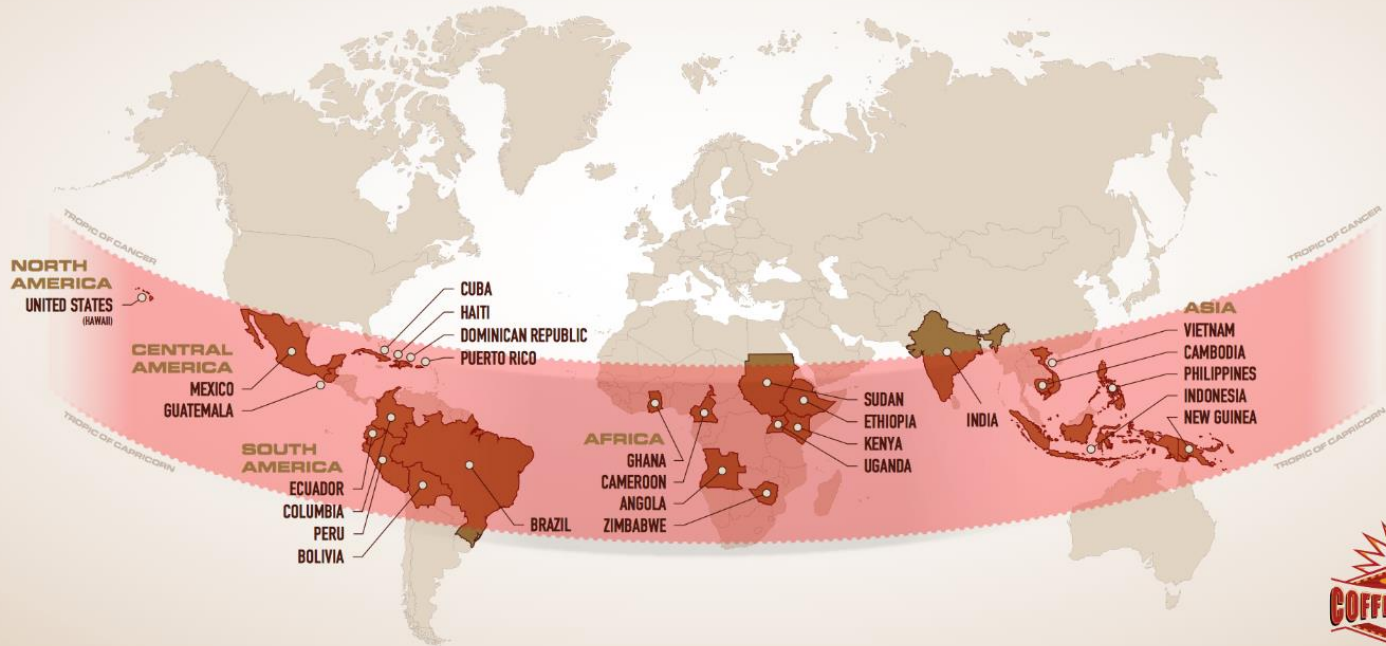
Zach Tapia (Biology)



The “Bean Belt”

THE COFFEE BEAN-GROWING BELT

All coffee is grown in a region found between the Tropic of Cancer and the Tropic of Capricorn in a region known as the “Bean Belt.”



Paxton & Gallagher Roastery



Paxton & Gallagher Roastery, Durham Museum Photo Archive

Butter-Nut Packaging, Durham Museum Photo Archive



Shade vs Sun Coffee

- Shade Grown Coffee
→ More Trees
- Sun Grown Coffee
→ Fewer Trees



Sun Grown vs Shade Grown Coffee, arbordayblog.org (2012)

Biodiversity Loss

- Less Trees → Less habitat
- Less habitat → Less species
- Less species → Species extinction

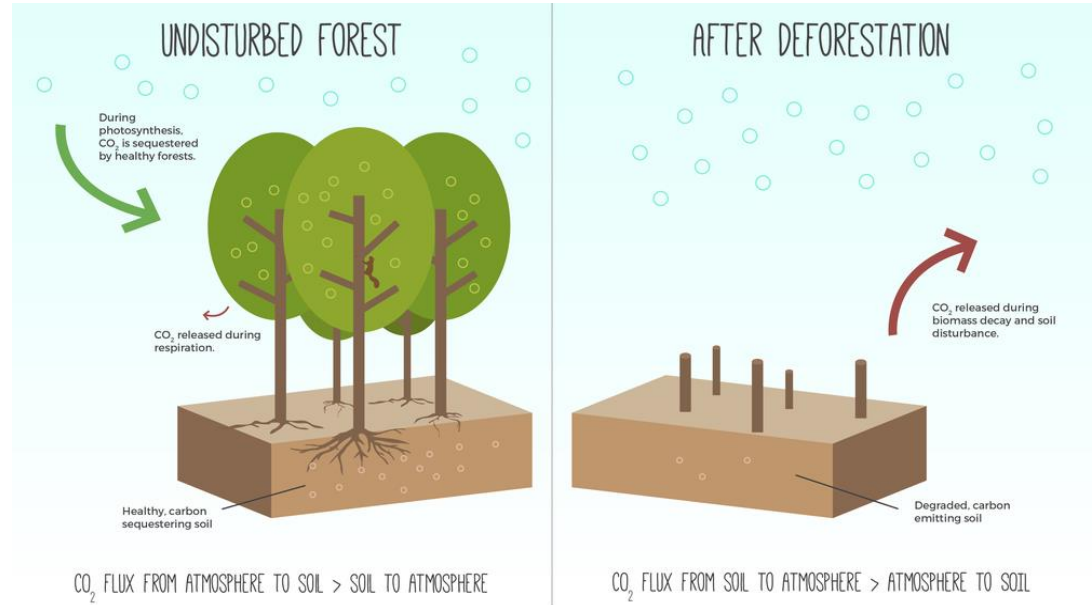


Coffee Deforestation, Mesoamerican Development Institute, mesoamerican.org (2017)

Carbon Footprint

- Few trees → Less carbon stored in soil
- Less carbon stored in soil → More CO₂ in the atmosphere

Deforestation Carbon Cycle, centerforcarbonremoval.org (2017)





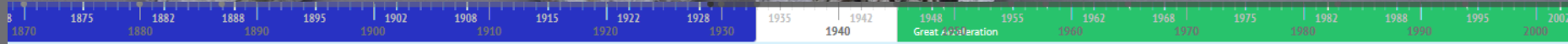
Drawing of a can of Butter-Nut Ground Coffee,
Durham Museum Photo Archive (1955)

Concrete

Jacob Ohnstad (Applied Physical Analysis & Sustainable Energy Science)

Sonya Ponzi (Environmental Science)

Durham Museum Collection



Downtown Omaha



Concrete

- Ingredients: sand, gravel, cement, and water
- Created in 1845
- Came to Omaha in 1860s



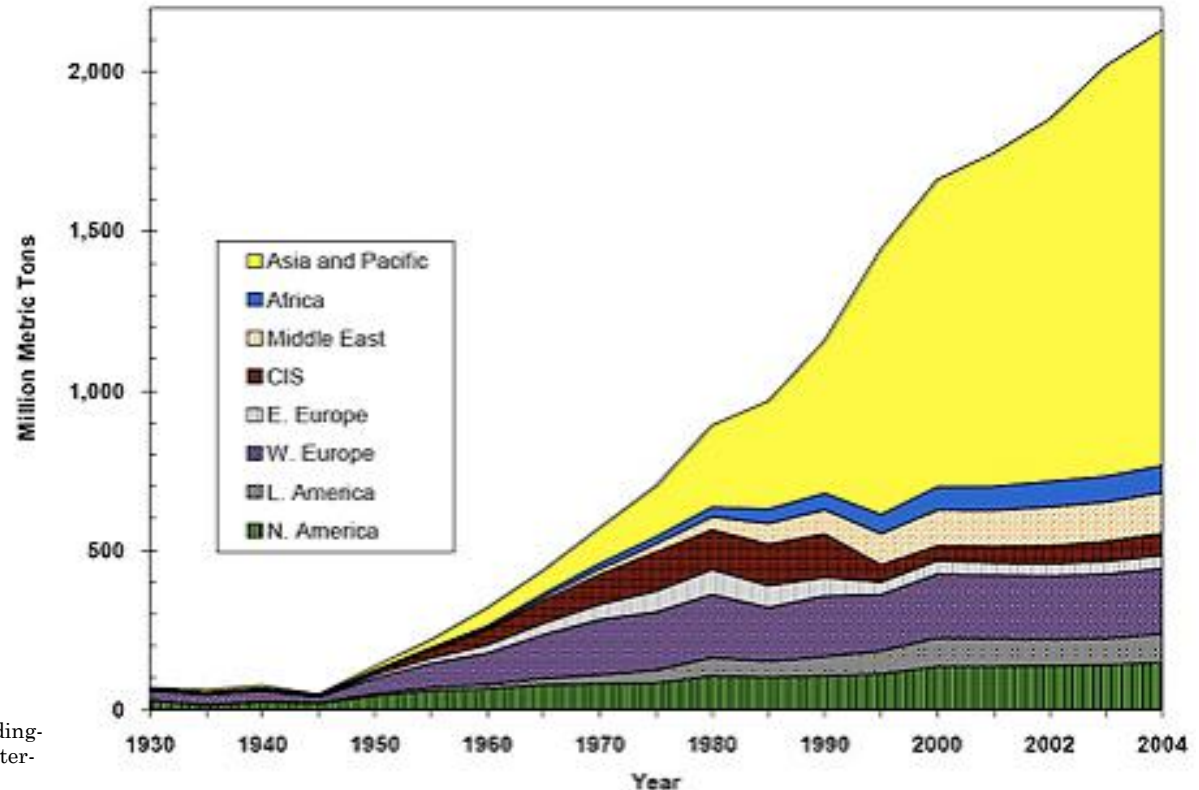
Durham Museum

- Came to Omaha in late 19th Century through rail car from Ash Grove, MO
- First local concrete plant in Louisville, NE 1929
- Durham finished construction in 1931



Concrete Consumption

- Consumed at a rate of 1 ton per person/year
- Second most consumed commodity
- Foundation for public infrastructure



Strip Mining

- Excavation leaves terraced holes in the earth
- Necessary for acquiring ingredients for concrete



Paving Our Way Through the Future



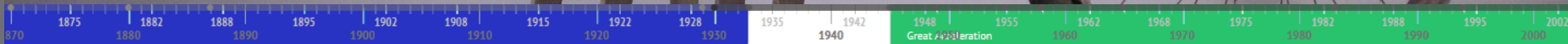
Crosby Associate, 2017
<https://www.crosbyassociates.com/pages/work/discipline/branding-visual-identity/mutual-of-omaha/>

Single-Wheel Hoe

Abigail Klick (*Exercise Science and Pre-Health*)

Michaela Peck (*Exercise Science and Pre-Health*)

Durham Museum Collection



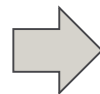
Plows Throughout History



Single-wheeled
hoe



Animal-pulled plow



Machine plow

Single-Wheeled Hoe

This plow consists of a bike tire wheel, two wooden handles, and a cultivator attachment.



On the Market

22

PETER HENDERSON & CO., NEW

"IRON AGE" SINGLE WHEEL HOE,
WITH
CULTIVATOR TEETH, PLOW and RAKES.



Price
complete, as shown
in this cut,
\$4.50.

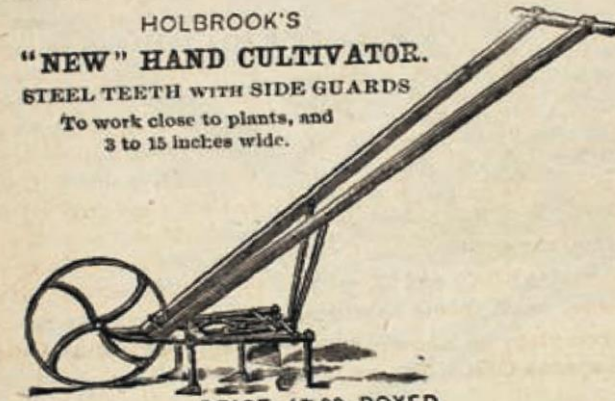
An extremely light, though exceedingly strong, implement of great importance for the rapid, thorough and easy cultivation of garden crops. It does not straddle the row like the double wheel machines, but for working *between* the rows it has no superior, and for small, family gardens it is preferred by some. It is furnished with 4 cultivator teeth for stirring the soil deep; 2 flat hoes for loosening crust and cutting off weeds; 2 rakes for leveling and pulverizing, and one hand-side plow for hilling up, furrowing, covering furrows, etc.; also, one leaf-guard, to lift leaves and vines aside, preventing injury and covering them with soil. **Price, \$4.50.**

Turn-of-the-Century Farm Tools and Implements
By Henderson & Co. 1847.

An 1847 advertisement for an
"Iron Age" Single Wheel Hoe
selling for \$4.50

HOLBROOK'S NEW HAND CULTIVATOR.

HOLBROOK'S
"NEW" HAND CULTIVATOR.
STEEL TEETH WITH SIDE GUARDS
To work close to plants, and
3 to 15 inches wide.



PRICE, \$7.00, BOXED.

Putting Down Roots: The Wheel Hoe. 2011.

An 1876 advertisement describing
Holbrook's New Hand Cultivator selling
for \$7.00

Parlin and Orendoff Plow Company

- Notice the boxcars parked alongside the building
 - This company took advantage of the railroad's ability to distribute agricultural products.
 - Helped transform farming into a big business in Omaha and the greater Nebraska



Durham Museum Photo Archive. Parlin and Orendoff Plow Company. 1911.

The Dust Bowl

- The use of plows disturbed the topsoil allowing it to become blow away
- pH and hydration of the remaining soil are altered
- The loss of nutrients made the soil infertile

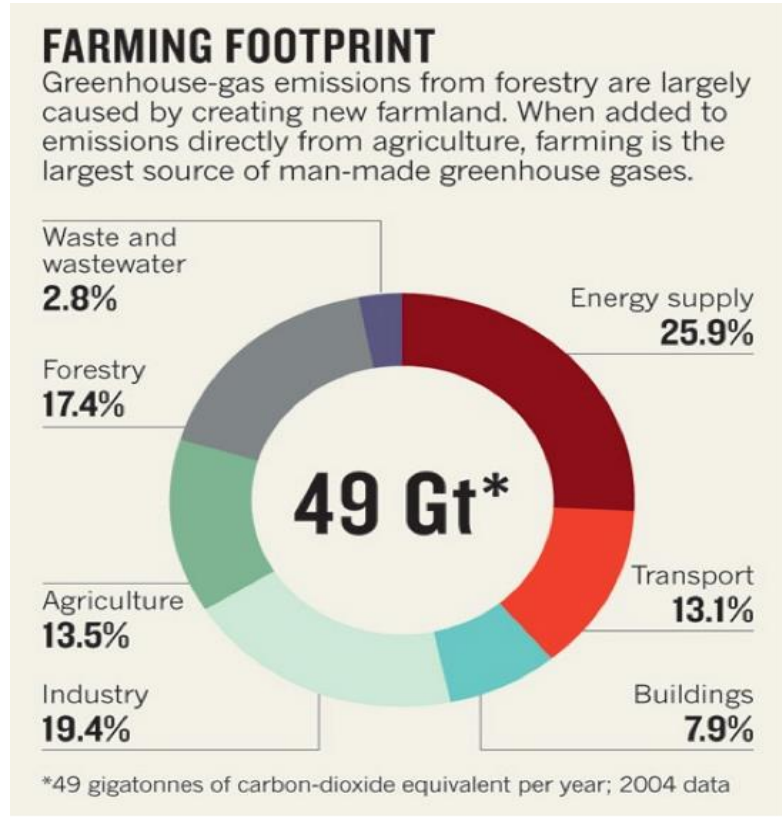


USDA Photo: The Dust Bowl. 1937.



Farming & the Atmosphere

- Carbon dioxide and nitrogen emissions from farming are major contributors to environmental change
- Sources of these emissions include
 - Deforestation for the creation of farm land
 - Environmental effects of soil erosion and water run off
 - Emissions from the use of farming equipment



Urban Farming Today

- Produces fewer emissions than large-scale farming
- Less soil disruption occurs with smaller farming equipment
- Fewer pesticides means less pollution in the soil and air
- Disadvantages: This type of farming is more labor intensive with lower yield



Servel Electrolux Refrigerator

Fletcher Guinn (*Computer Science and Informatics*)
Eric Heffelfinger (*Secondary Education*)



Durham Museum Collection



The Refrigerator & Consumer Revolution

*"Human identity is no longer defined by what one does,
but by what one owns"*

- President Jimmy Carter

Refrigerators allowed the public to have year round access to food and contributed to the consumer revolution



Competing Companies and CFCs

- Electrolux Servel Inc. refrigerator
- Competing companies using Freon (CFCs)
- Great Acceleration produces age of consumption
- Servel's refrigerators are less efficient and fall to Freon using refrigerators
- These CFCs had unknown environmental consequences

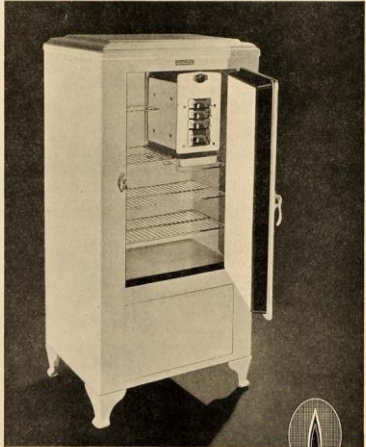
Electrolux [Advertisement]. (1933, July 22).
The Saturday Evening Post, p. 32.

32 THE SATURDAY EVENING POST July 22, 1933

 HUSBANDS EXPECT . . . <i>Lowest Operating Cost Freedom from Repairs Absolute Silence Prompt Gas Company Service Plenty of Ice Cubes</i>	 WIVES EXPECT . . . <i>Constant, Steady Cold No Bothersome Defrosting Regulator to Speed Freezing Trays that Release Easily Split Shelves for Extra Bottles</i>
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ELECTROLUX

gives you everything you expect...AND MORE!



**Lowest operating cost
permanent silence . . . it's years
in advance of the rest**

EVERY FAMILY wants an automatic refrigerator . . . some day. It's the safest, most economical way to protect foods, to cool beverages, and to freeze desserts.

The next question is "which automatic refrigerator?" And right here is where we want to tell you why you can expect more from the New Air-Cooled Electrolux.

It has no moving parts. Not one! A tiny gas flame keeps the simple refrigerant circulating, and ordinary air cools it. That's why Electrolux is absolutely silent and so trouble-free. It's the *missing* parts that become noisy. It's the *missing* parts that wear. Electrolux has none!

Today Electrolux has the lowest operating cost. And this cost will never be raised by the inefficiency of worn parts.

See the New Air-Cooled Electrolux. Let the salesman show you the trigger tray release, the split shelves, the temperature regulator, and the many other reasons why you can expect more from Electrolux.

Remember, with all its superiorities, the New Air-Cooled Electrolux costs no more than other leading refrigerators . . . costs considerably less over a period of years.

We make only the finest refrigerators we know how to make. Electrolux has no second line, no "bargain" leaders.

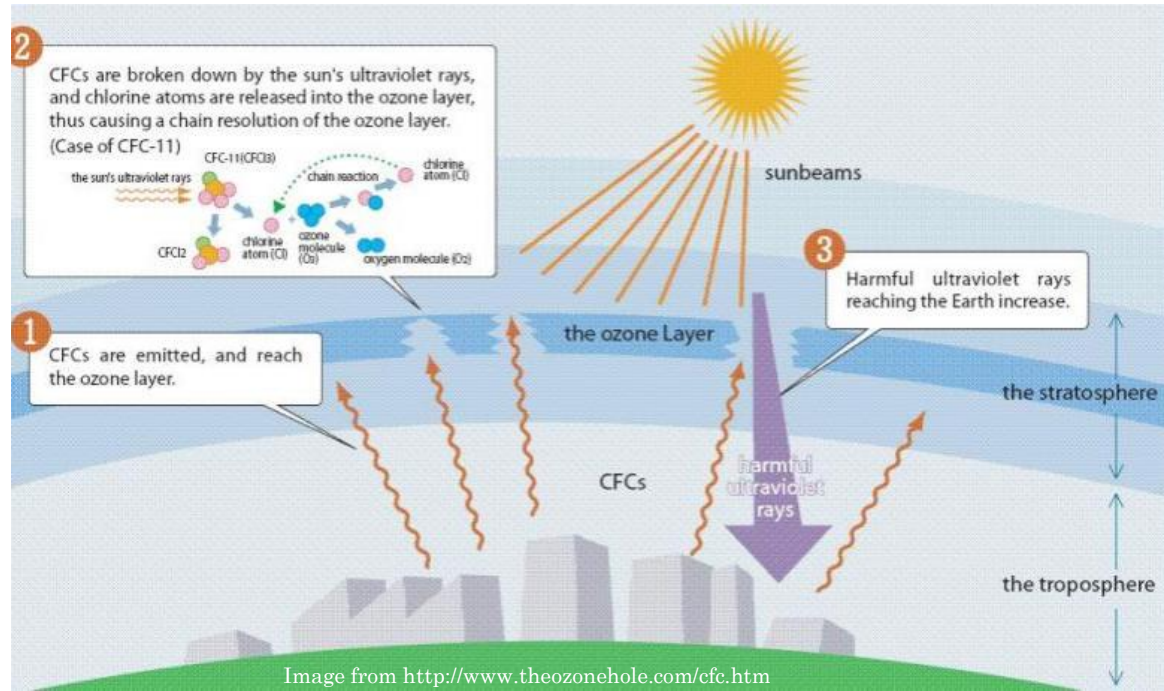
That's one reason why your gas company, with its reputation for prompt, willing service, gladly stands behind every Electrolux. And that's another reason why Electrolux offers you more. On display at your own gas company or neighborhood dealer's showroom. Can be operated with tank gas where there are no mains. Electrolux Refrigerator Sales, Inc., Evansville, Ind.



NEW *Air-Cooled* **ELECTROLUX** THE *Gas* REFRIGERATOR
A PRODUCT OF SERVEL

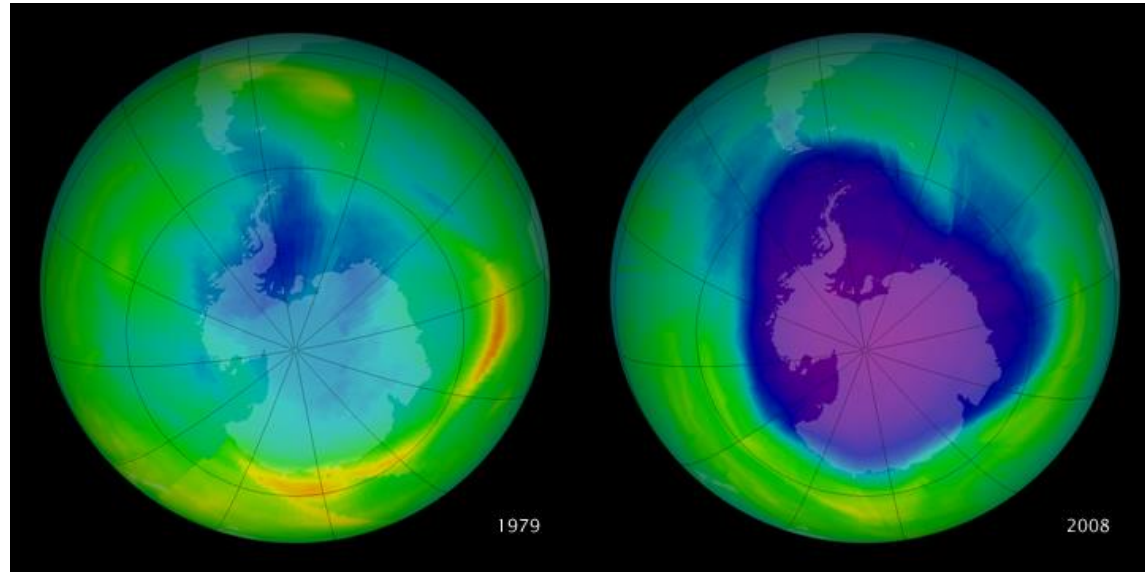
CFCs and the Ozone Layer

- Ozone layer in in the stratosphere
- CFCs get emitted by humans
- The bonds are broken apart and chlorine atoms are released
- Reaction with the ozone layer, and UV radiation reaches earth



The Ozone Layer

- Ozone layer depletion from CFCs
- CFCs banned in 1986
- Damage continued because how long they stay in the atmosphere



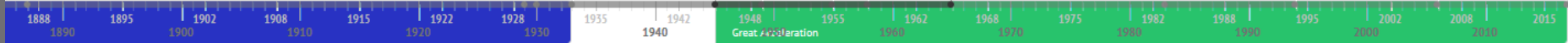
<https://earthobservatory.nasa.gov/IOTD/view.php?id=38835>

Fallout Shelter Sign

Jesus Perez (*Biology*)

Wade Peyou (*Computer Science & Informatics*)

Durham Museum Collection



U.S. Atomic Bomb Testing



Trinity Bomb Testing on July 16, 1945 in New Mexico

July 16, 1945. U.S. Department of Defense . The Atlantic . July 16, 2015. Accessed November 18, 2017.

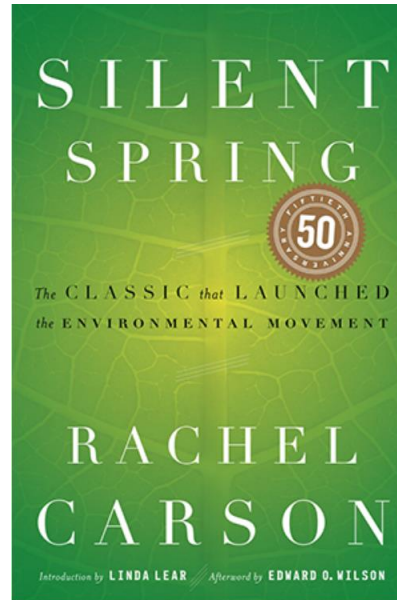
<https://www.theatlantic.com/photo/2015/07/70-years-since-trinity-when-we-tested-nuclear-bombs/398735/>.

FS2 Fallout Shelter Sign

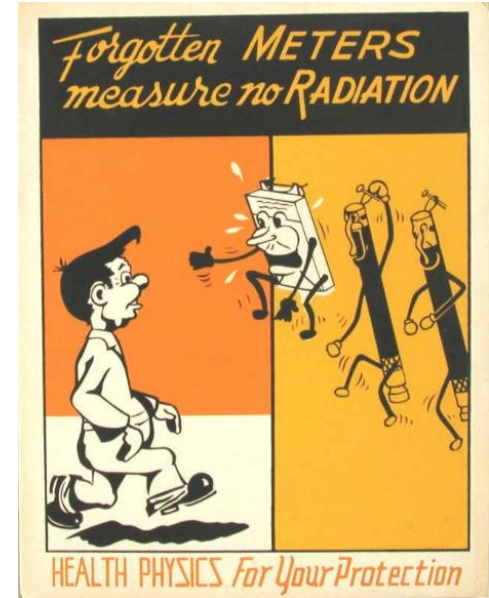


Invisible Pollutants: Ionizing Radiation

- What makes fallout radiation from chemical toxins?
- Inauguration of fear culture
- Irreversible damage to the biosphere
Emergence of radioactive isotopes



Rachel Carson, *Silent Spring*, 1962.



"Health Physics & Nuclear Medicine During the Manhattan Project." Atomic Heritage Foundation. June 29, 2017. Accessed November 26, 2017. <https://www.atomicheritage.org/history/health-physics-nuclear-medicine-during-manhattan-project>.

Politicized Fear: Emergence of Ecological Thinking

- Published research of atomic bomb testing
-
- Radio Shows
- Environmental and Health Repercussions
- Fallout Shelters Solution?

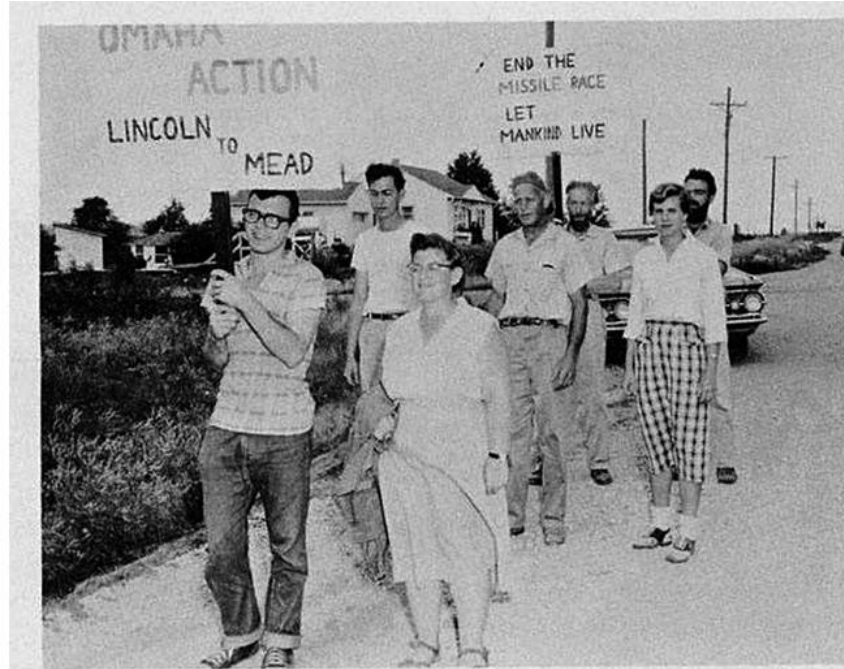


Dual purpose fallout shelter in the basement of a house

"Photographs and Pamphlet about Nuclear Fallout." National Archives and Records Administration.

SAC and Omaha's Nuclear Opposition

- Omaha was a Strategic Target
- Agriculture was particularly susceptible
- Protests, Boycotts, and Political Letters



THE LINCOLN WALK. LEFT TO RIGHT: JOHN WHITE, ED LAZAR, ERICA ENZER, WENDALL BULL, ROSS ANDERSON, LAURIE LOVETT, AND DON FORTENBERRY.

The Anthropocene & the Nuclear Age of Mankind



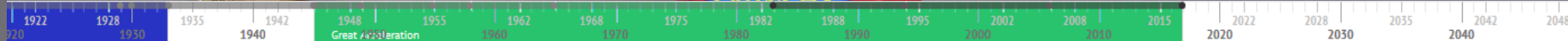
ConAgra Foods

Brittany Keath (*Biology*)

Patrick Eiden (*Biology, Spanish*)



Durham Museum Collection



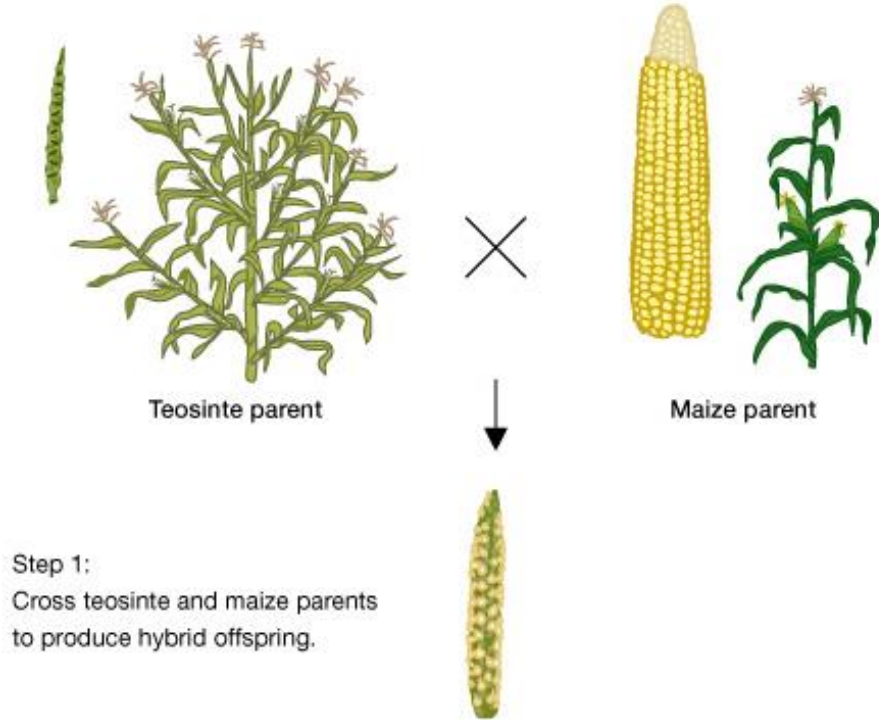
Foods You Know

- Many familiar foods contain corn derivatives like cornstarch, corn syrup, or corn itself.
- Agriculture has a long history of environmental impacts.
- Companies like ConAgra influence agricultural practices like the use of GMOs.



History of GMOs

- The first methods for genetic modification involved artificial selection.
- Corn is a great example of artificial selection.
- Modern methods for genetic modification involve changing the genome directly.



ConAgra in the Anthropocene

- ConAgra has stated that they plan to remove GMOs from their products.
- Companies like ConAgra influence the use of GMOs worldwide.



Thank you!