

Agriculture, Environment, and Energy

Soil

Precursors to industrialization of agriculture

sugar, coffee and cotton

Pesticide, fertilizer, seed package

Agriculture in 18th century

Social and enviro effects

Night soil and nutrient recycling

Meat and processed foods

Infinite soil/Utilitarian nature

McCormick Reaper

Dust Bowl

The search for fertilizers

Guano

Haber-Bosch Ammonia Synthesis

Early consequences of industrialization of agriculture

Green Revolution

Problems GR addressed

arable land depletion and property distribution

Green Revolution as Child of Cold War

Rockefeller Foundation and Norman Borlaug



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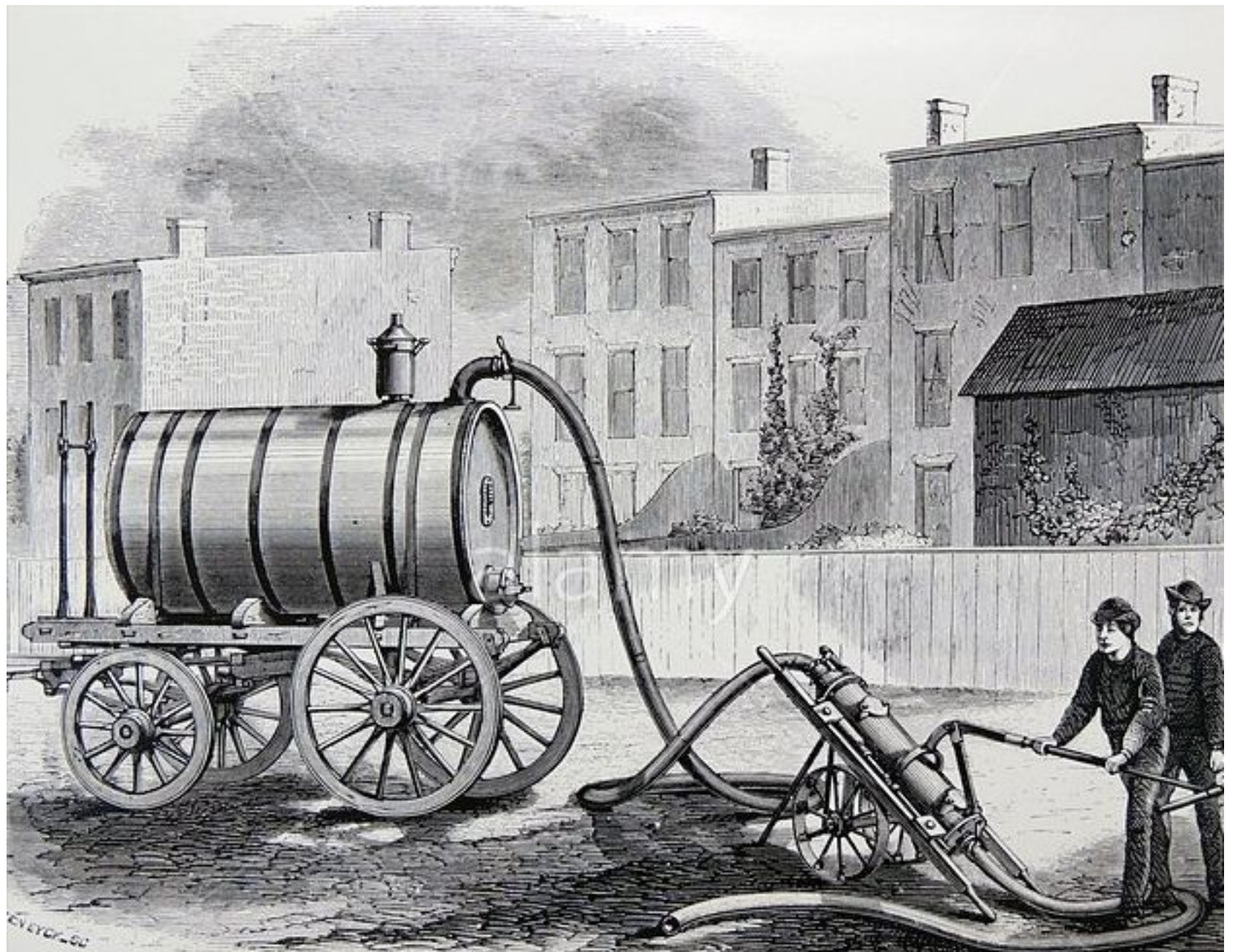
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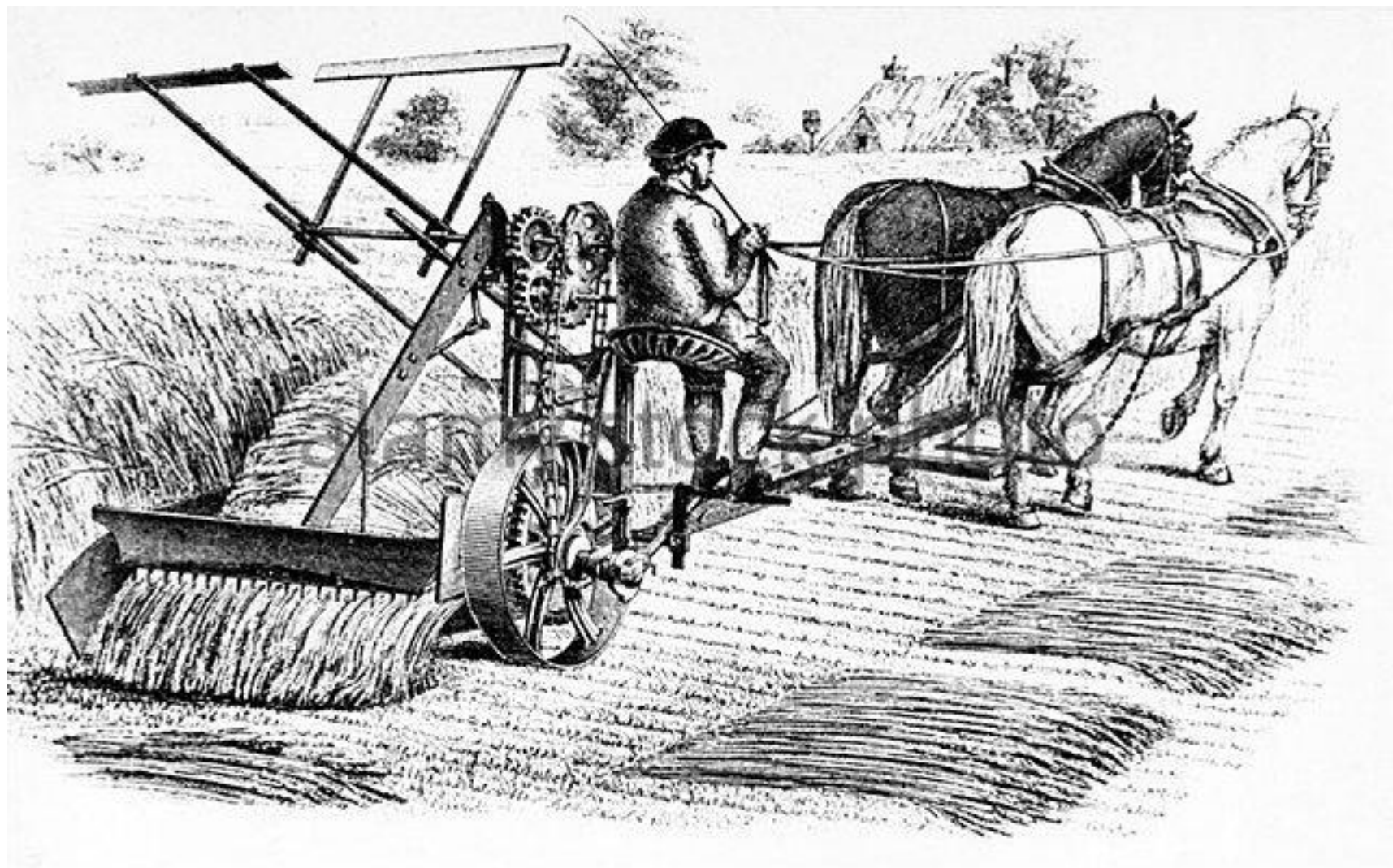
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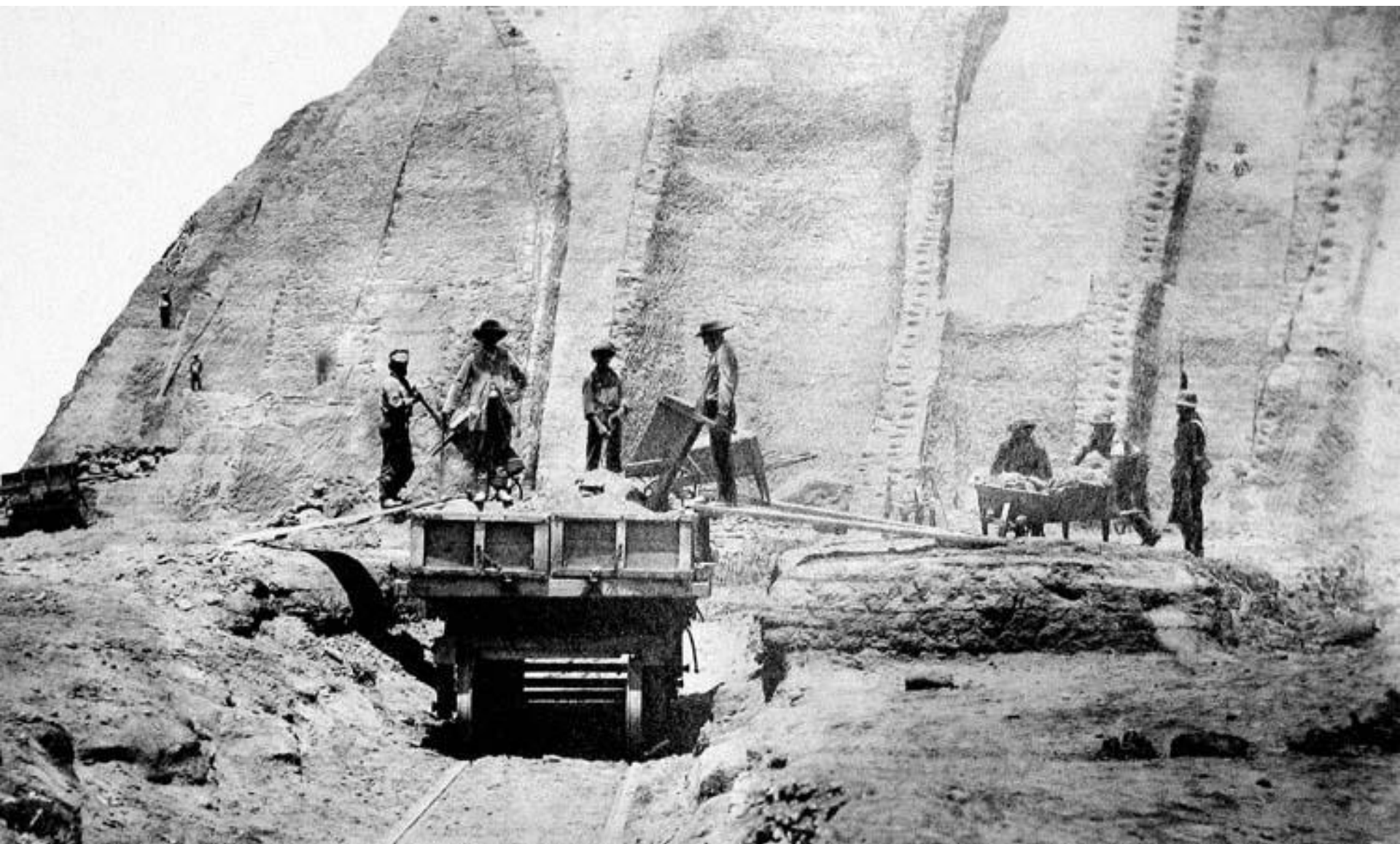
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Early consequences of industrialization of ag

- Notion of limitless nature via technology
- Pollution—eutrophication of water and land contamination
- Fossil fuel use increases
- Accumulation of land and wealth in hands of few
- Transition to monoculture

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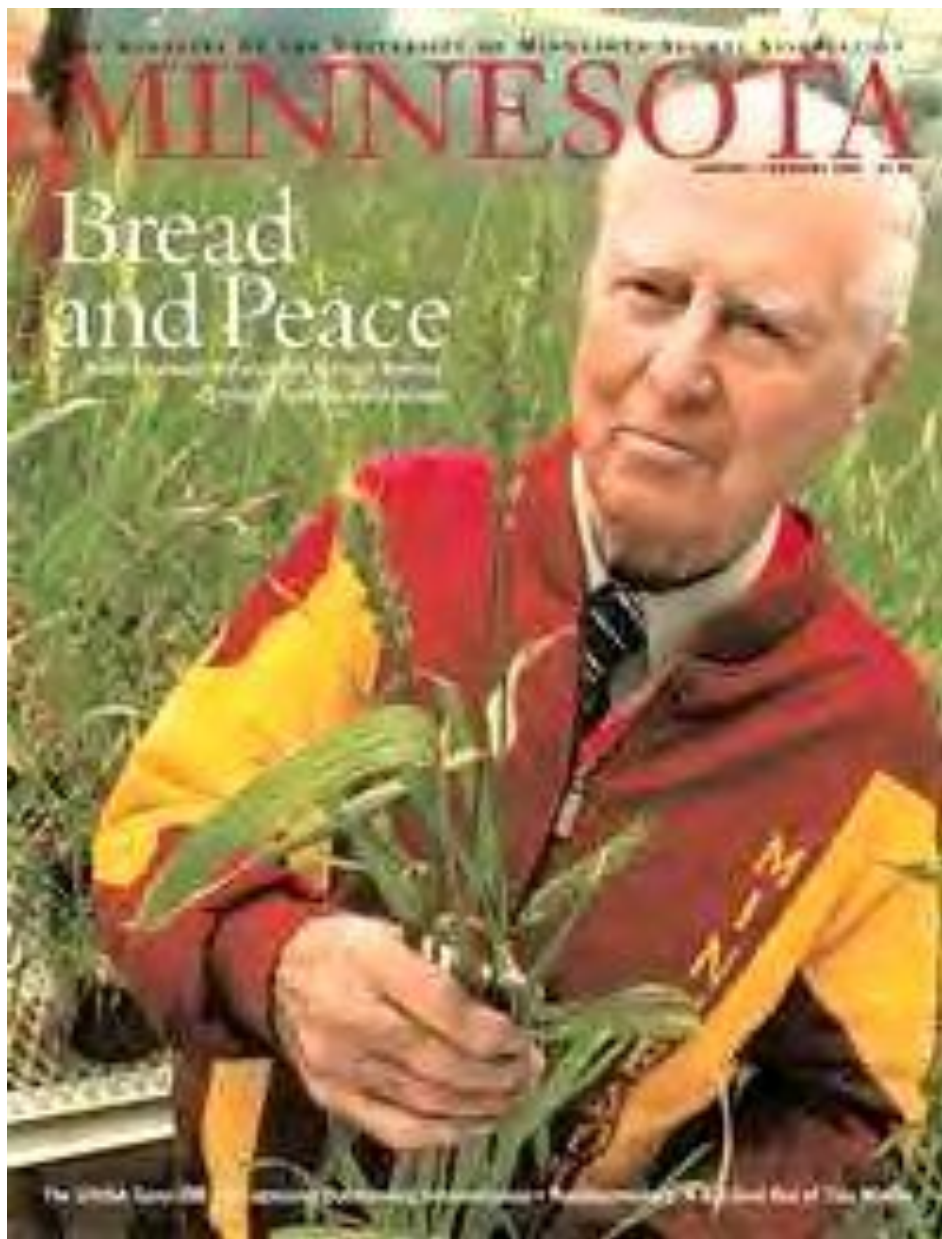
Green Revolution

- A set of technological innovations to boost farming yields, first in Mexico and then spread elsewhere
- Hybrid seeds, chemical fertilizers, pesticides
- A technological fix to a complex problem

What did Green Revolution proponents seek to address

- Population boom
- Soil erosion and compaction, often due to earlier technologically dependent farming practices
- The land problem
- Cold War fear of communism in Global South





Norman Bourlag's words on the Green Revolution:

“The idea that agriculture’s just nothing but a way of life and not an industry is a misnomer which has had too long a history. Agriculture is a business; it is an industry—and treated as such it responds beautifully.”

“In this Cold War struggle for the minds of men, the side that best helps satisfy man’s primary needs for food, clothing, and shelter is likely to win.”

The Main objectives

- Win Cold War by feeding people under capitalism
- Do this by empowering technical experts who believe in the power of technology no matter the costs
- Empower large landowners and corps who would together increase ag production
- Equity or redistribution was rarely a consideration

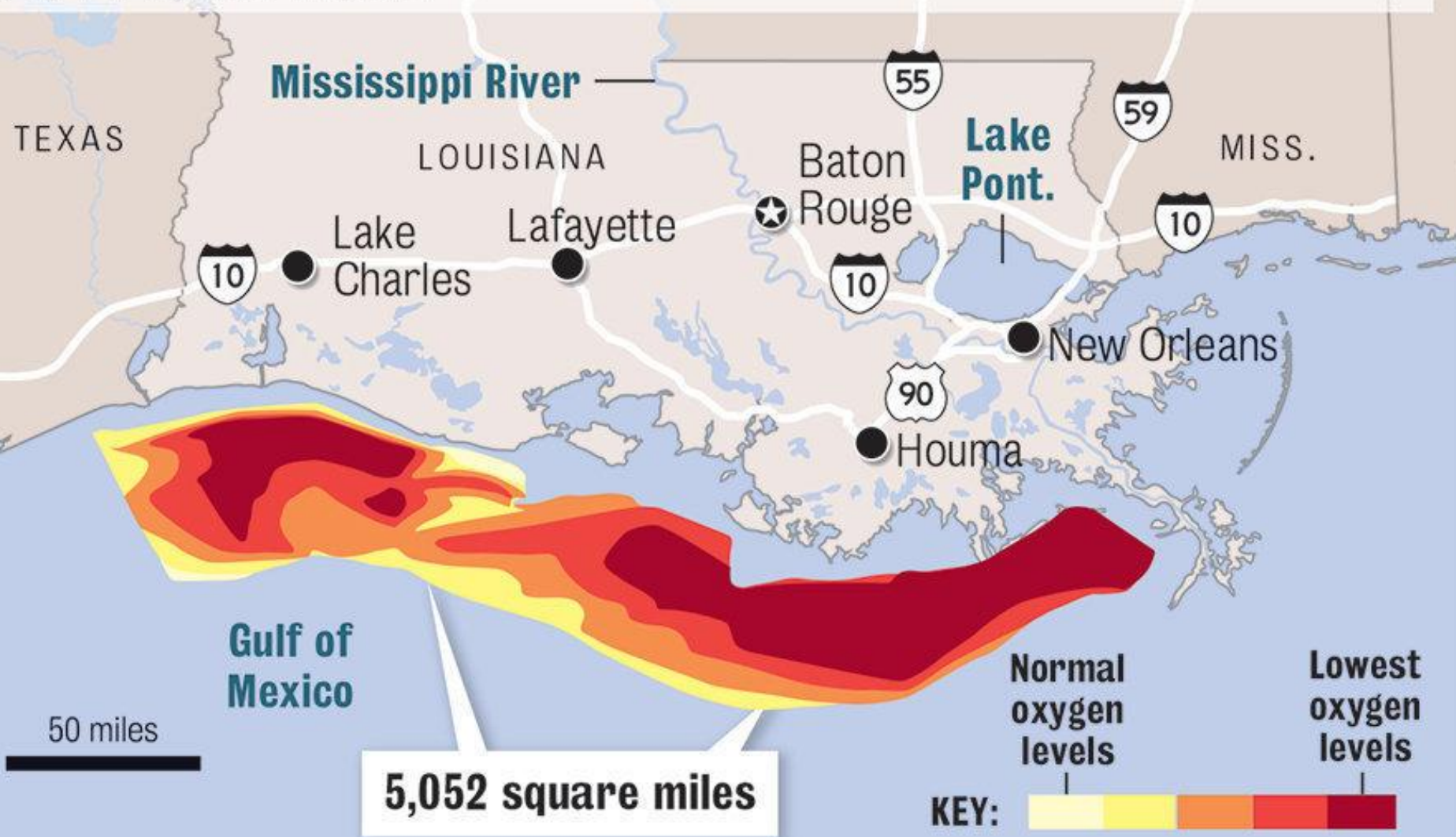
Social and Environmental Consequences

- Monoculture □ constant application of pesticides
- Pollution of land, water and people from pesticides
- Fossil fuels and global warming as a result
- Diminishing returns of fertilizer and pesticides
- Mass irrigation □ salinization and water depletion
- Agribusiness dominance of countrysides
- Encouraged processed foods



2014 DEAD ZONE

Area of oxygen-deprived bottom-water



Sources: Nancy Rabalais, Louisiana Universities Marine Consortium; Eugene Turner, Louisiana State University; NOAA Center for Sponsored Coastal Ocean Research



**MORE THAN JUST
A DROP IN THE
OCEAN**

- Already dead
- Areas of concern

Dead zones are rapidly increasing as oceans warm

- They are caused by excess nutrients and warming waters.
- The zones can suffocate fish, squid and other marine life.
- There are more than 400 ocean dead zones in the world's seas.
- Waters around Tasmania and near Perth were recently included on the list.

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Possible alternatives?

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Criticisms of Ind agriculture

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Was it the only path?

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1kg beef
needs :

121,8 m² arable
land

1500 litres
water

7 litres
petrol

This is equivalent to :

160 kg potatoes



1 year's daily
shower



Cows emit 80 times the greenhouse gases for the equivalent of 1kg of wheat.

Why was the Green Revolution pursued so relentlessly after 1945 by the U.S political elite and agribusiness?

- A. Because they wanted the rural poor in the 3rd world to gain access to land
- B. Because they believed that technical inputs controlled by big companies would feed more people and allow capitalism to prevail over communism
- C. Because politically influential middle-class Americans in the US demanded the improvement of agriculture in the Global South
- D. Because they were altruistic and cared only about the hundreds of millions of poor people in the Global South who faced potential famine with depleting soils

Was the ind of agriculture necessary?

- Did feed growing population
- Showed deleterious effects it is having
- What about greatest good for greatest number?
 - Poor and unequal distribution of food
 - Land use and regulation, who benefits?

But isn't this just progress?

- Progress as growth using invasive technologies
- Advances in sustainable organic farming as alternative, or at least to complement conventional industrial practices

Lecture Reflection questions:

What is your idea of progress? Is this class beginning to complicate/revise your idea of progress?

What is your idea of the role of technology in society and history? Is this class changing these ideas?

In your estimation, apart from climate change, what is the most Important environmental problem to address:

- A. Air pollution
- B. Water pollution
- C. Soil loss and salinization
- D. The 6th extinction
- E. Environmental Injustice