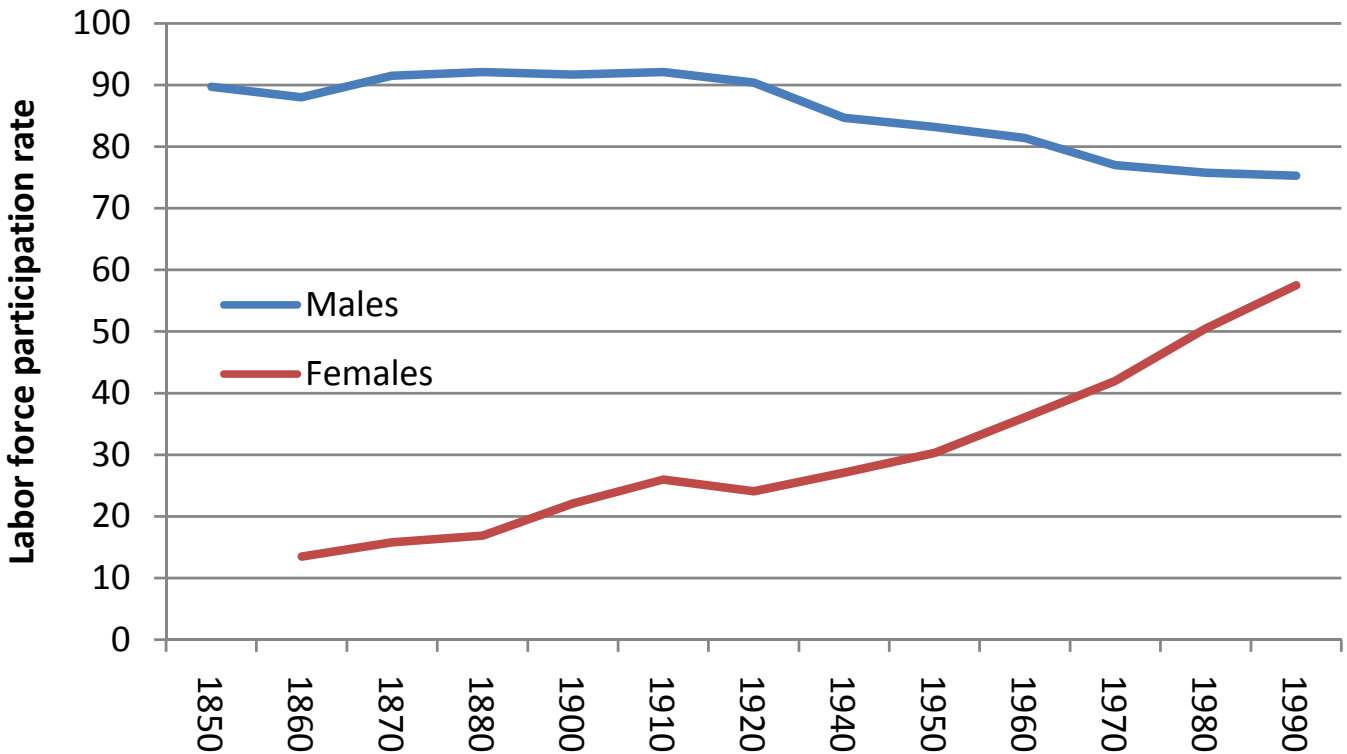
Endgame

- Plan for the last lectures is to wrap up early industrialization, cover the rise of an educated workforce, and briefly discuss the Great Depression
- In terms of readings, the remaining required readings will be Atack and Passell Chapter 7 and the article on America's graduation from high school by Claudia Goldin
- Questions are posted for these readings
- Remember that the final is not cumulative (still responsible for past material as it relates to new material)
- Final will cover everything from slavery on
- Don't hesitate to ask questions about your papers

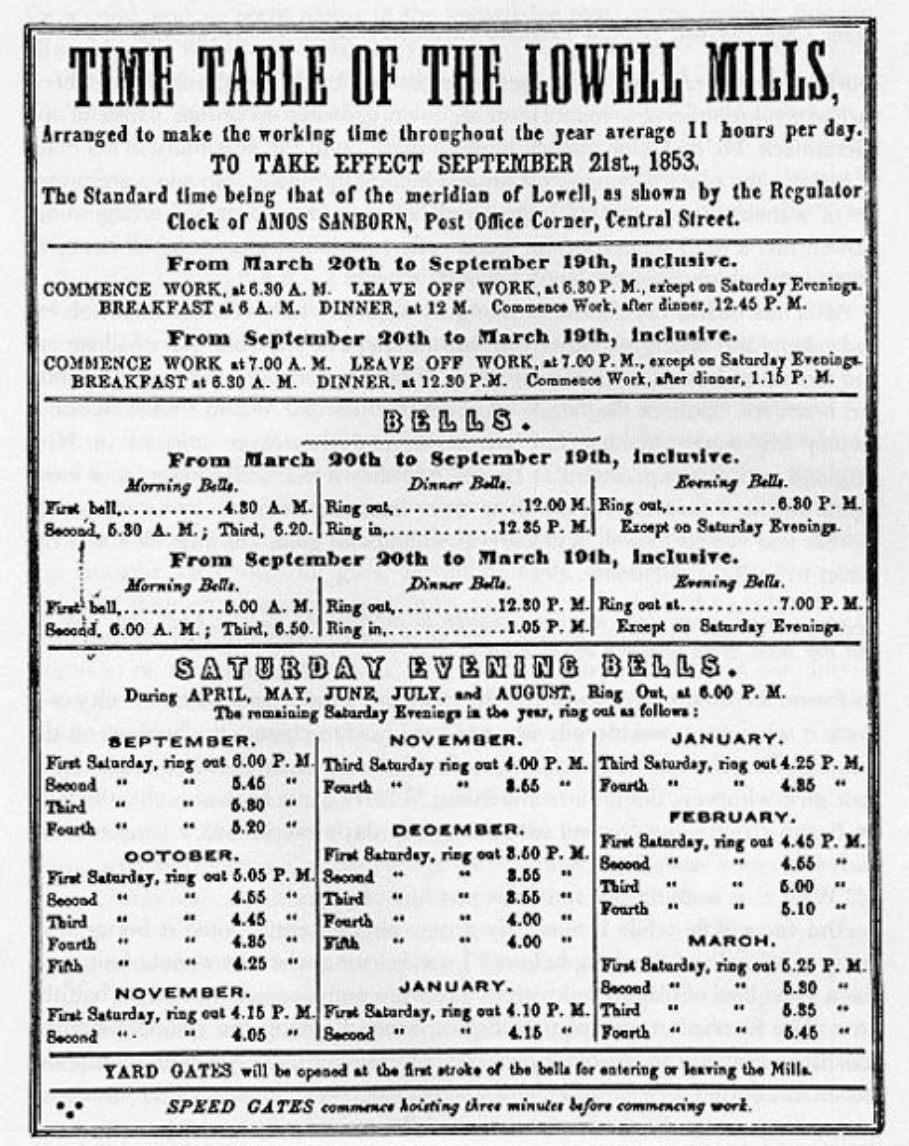
Industrialization and the Labor Force

- We've talked a little about how industrialization changed the composition of the labor force
- The early mills provided a new source of employment for females
- Industrialization in general moved workers from farms to factories and changed the skills needed by workers
- We'll take a look at a few features of the changing workforce:
  - Changes in female labor force participation
  - Changes in child labor
  - Changes in demand for education

Women in the Workforce



Women in the Workforce



TIME TABLE OF THE LOWELL MILLS,

Arranged to make the working time throughout the year average 11 hours per day.

TO TAKE EFFECT SEPTEMBER 21st., 1853.

The Standard time being that of the meridian of Lowell, as shown by the Regulator Clock of AMOS SANBORN, Post Office Corner, Central Street.

From March 20th to September 19th, inclusive.

COMMENCE WORK, at 6.30 A. M. LEAVE OFF WORK, at 6.30 P. M., except on Saturday Evenings.
BREAKFAST at 6 A. M. DINNER, at 12 M. Commence Work, after dinner, 12.45 P. M.

From September 20th to March 19th, inclusive.

COMMENCE WORK at 7.00 A. M. LEAVE OFF WORK, at 7.00 P. M., except on Saturday Evenings.
BREAKFAST at 6.30 A. M. DINNER, at 12.30 P.M. Commence Work, after dinner, 1.15 P. M.

BELLS.

From March 20th to September 19th, inclusive.

Morning Bells.	*Dinner Bells.*	*Evening Bells.*
First bell,.....4.30 A. M.	Ring out,.....12.00 M.	Ring out,.....6.30 P. M.
Second, 5.30 A. M.; Third, 6.20.	Ring in,.....12.35 P. M.	Except on Saturday Evenings.

From September 20th to March 19th, inclusive.

Morning Bells.	*Dinner Bells.*	*Evening Bells.*
First bell,.....5.00 A. M.	Ring out,.....12.30 P. M.	Ring out at.....7.00 P. M.
Second, 6.00 A. M.; Third, 6.50.	Ring in,.....1.05 P. M.	Except on Saturday Evenings.

SATURDAY EVENING BELLS.

During APRIL, MAY, JUNE, JULY, and AUGUST, Ring Out, at 6.00 P. M.
The remaining Saturday Evenings in the year, ring out as follows:

SEPTEMBER.

First Saturday, ring out	6.00	P. M.
Second " "	5.45	"
Third " "	5.30	"
Fourth " "	5.20	"

OCTOBER.

First Saturday, ring out	5.05	P. M.
Second " "	4.55	"
Third " "	4.45	"
Fourth " "	4.35	"
Fifth " "	4.25	"

NOVEMBER.

First Saturday, ring out	4.15	P. M.
Second " "	4.05	"
Third Saturday ring out	4.00	P. M.
Fourth " "	3.55	"

DECEMBER.

First Saturday, ring out	3.50	P. M.
Second " "	3.55	"
Third " "	3.55	"
Fourth " "	4.00	"
Fifth " "	4.00	"

JANUARY.

First Saturday, ring out	4.10	P. M.
Second " "	4.15	"
Third Saturday, ring out	4.25	P. M.
Fourth " "	4.35	"

FEBRUARY.

First Saturday, ring out	4.45	P. M.
Second " "	4.55	"
Third " "	5.00	"
Fourth " "	5.10	"

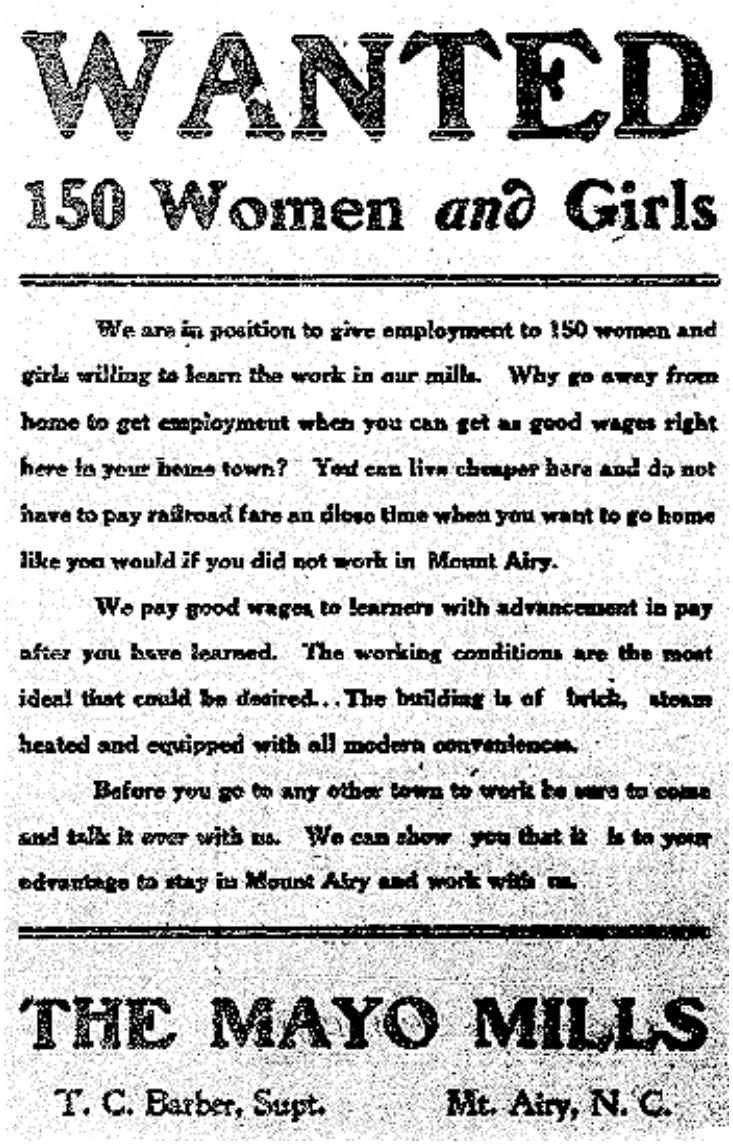
MARCH.

First Saturday, ring out	5.25	P. M.
Second " "	5.30	"
Third " "	5.35	"
Fourth " "	5.45	"

YARD GATES will be opened at the first stroke of the bells for entering or leaving the Mills.

*** *SPEED GATES commence hoisting three minutes before commencing work.*

Women in the Workforce



WANTED

150 Women *and* Girls

We are in position to give employment to 150 women and girls willing to learn the work in our mills. Why go away from home to get employment when you can get as good wages right here in your home town? You can live cheaper here and do not have to pay railroad fare an dlose time when you want to go home like you would if you did not work in Mount Airy.

We pay good wages to learners with advancement in pay after you have learned. The working conditions are the most ideal that could be desired...The building is of brick, steam heated and equipped with all modern conveniences.

Before you go to any other town to work be sure to come and talk it over with us. We can show you that it is to your advantage to stay in Mount Airy and work with us.

THE MAYO MILLS

T. C. Barber, Supt. Mt. Airy, N. C.

Women and the Industrious Revolution

- Jan de Vries (JEH, 1994) proposed a model to understand the changing nature of the workforce, the Industrious Revolution
- The basics of his model:
  - Households combine store-bought goods with their own labor to create consumption goods
  - Time is divided between labor supplied to the market (for wages), labor used in household production (for example, cooking), and time spent for leisure
  - Household utility comes from leisure and the final consumption goods (purchased goods + home labor)

Women and the Industrious Revolution

- The Industrious Revolution was composed of two major transformations that occurred between the mid-17th century and the early 19th century:
  - Reduction in leisure time as the marginal utility of money income rose
  - Reallocation of labor from goods and services for direct consumption to marketed goods
- His model leads to several implications for females engaging market-oriented economic activity

Effects of the Industrious Revolution

- Greater labor force participation of all household members, especially females
- Greater labor force participation fed back into industrialization through increased demand for market goods
- Shift from self-sufficiency to market-oriented production
- Greater importance of economic alliances with outsiders
- Females become automous earners

The Industrious Revolution and Work Hours

Male Labor Hours per Day

Group or location	Group or activity	Hours
Tatuyo	Shifting cultivation, hunting	7.6
Mikea	Shifting cultivation, foraging	7.4
Ache	Hunting	6.9
Abelam	Subsistence agriculture, hunting	6.5
!Kung	Foraging	6.4
Machiguenga	Shifting cultivation, foraging, hunting	6
Xavante	Shifting cultivation, hunting	5.9
Aruni	Subsistence agriculture	5.2
Mekranoti	Shifting cultivation, foraging, hunting	3.9
Shipibo	Subsistence agriculture, fishing	3.4
Bemba	Shifting cultivation, hunting	3.4
Hiwi	Hunting	3
Yanomamo	Shifting cultivation, foraging, hunting	2.8
Britain, 1800	Farm laborers, paid labor	8.2
Britain, 1800	Building workers, paid labor	8.2
London, 1800	All workers, paid labor	9.1
United Kingdom, 2000	All workers aged 16-64	8.8

Clark, 2007

The Industrious Revolution and Work Hours

Annual Work Hours Over 800 Years

Period	Type of worker	Annual hours
13th century	Adult male peasant, UK	1620 hours
14th century	Casual laborer, UK	1440 hours
Middle Ages	English worker	2309 hours
1400-1600	Farmer-miner, adult male, UK	1980 hours
1840	Average worker, UK	3105-3588 hours
1850	Average worker, U.S.	3150-3650 hours
1987	Average worker, U.S.	1949 hours
1988	Manufacturing workers, UK	1855 hours
2000	Average worker, Germany	1362 hours

The Middle Ages observation corresponds England in the 1400s.

The Industrious Revolution and Work Hours

- Before industrialization there were irregular work hours and significant household production
- By 1700, mills started imposing stricter regulation of work hours, machines added even more structure to the work day as industrialization progressed
- Forces creating time-discipline: division of labor, supervision of labor, fines, bells, clocks, money incentives, preaching, schooling, suppression of fairs and sports
- There is a general retraining of workers to adhere to a rigid work day

The Industrious Revolution and Work Hours

William Temple, an advocate of workhouses for poor children, 1770:

> *There is considerable use in their being, somehow or other, constantly employed at least twelve hours a day, whether they earn their living or not; for by these means, we hope that the rising generation will be so habituated to constant employment that it would at length prove agreeable and entertaining to them...*

How Do We Learn About Time Use?

Modern time use data:

- Electronic pagers - write down what you're doing when your paged
- Time use diaries - keep a journal of everything you did
- Random hour recall - asked to recall everything you did in one randomly chosen hour of a previous day

What's available in the 1700's?

- No 18th century pagers
- No sociologists to gather time use diaries
- Criminal courts to do random hour recalls for witnesses

Old Bailey Sessions Papers

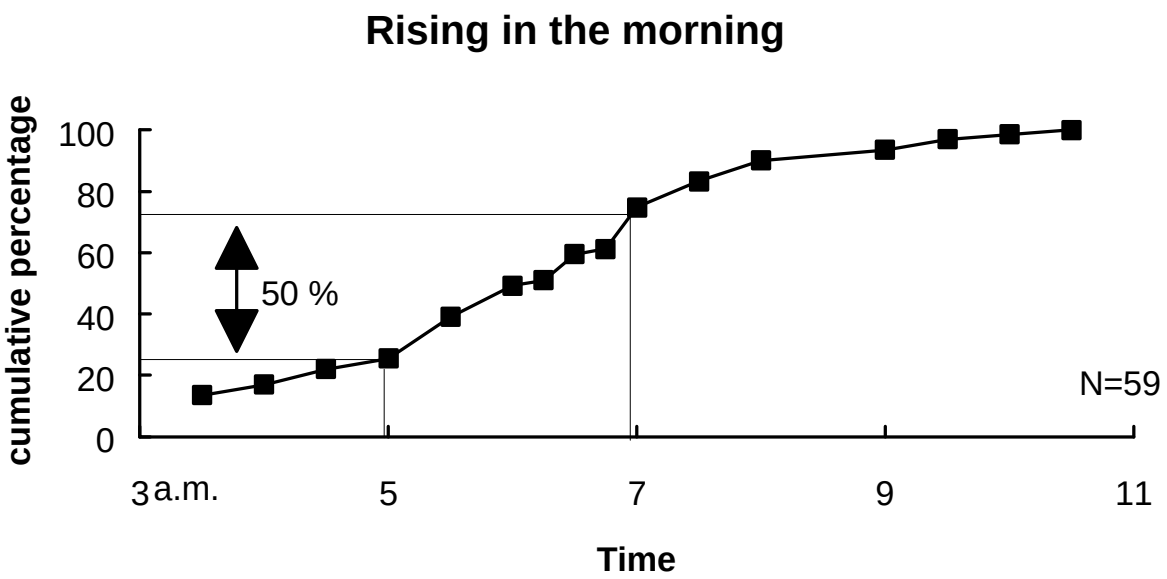
Thomas Wale. I am a Carpenter: I was at work at a building in Queen Anne's-street, near Marybone; I locked up my tools in my chest, on the 20th of January at night, being a Saturday night in that house, and on Monday the 22d when I went to work in the morning, I found my chest had be brook open...

Q. What time did you go there in the morning?

Wale. About six o'clock.

http://www.oldbaileyonline.org

Rising Times



Work Hours during the Industrial Revolution

Table 4: Working hours/year, 1760 and 1800

	1760	*1800*	*Δ*
Lower Bound	2,288	3,366	1,078
Upper Bound	2,631	3,538	907

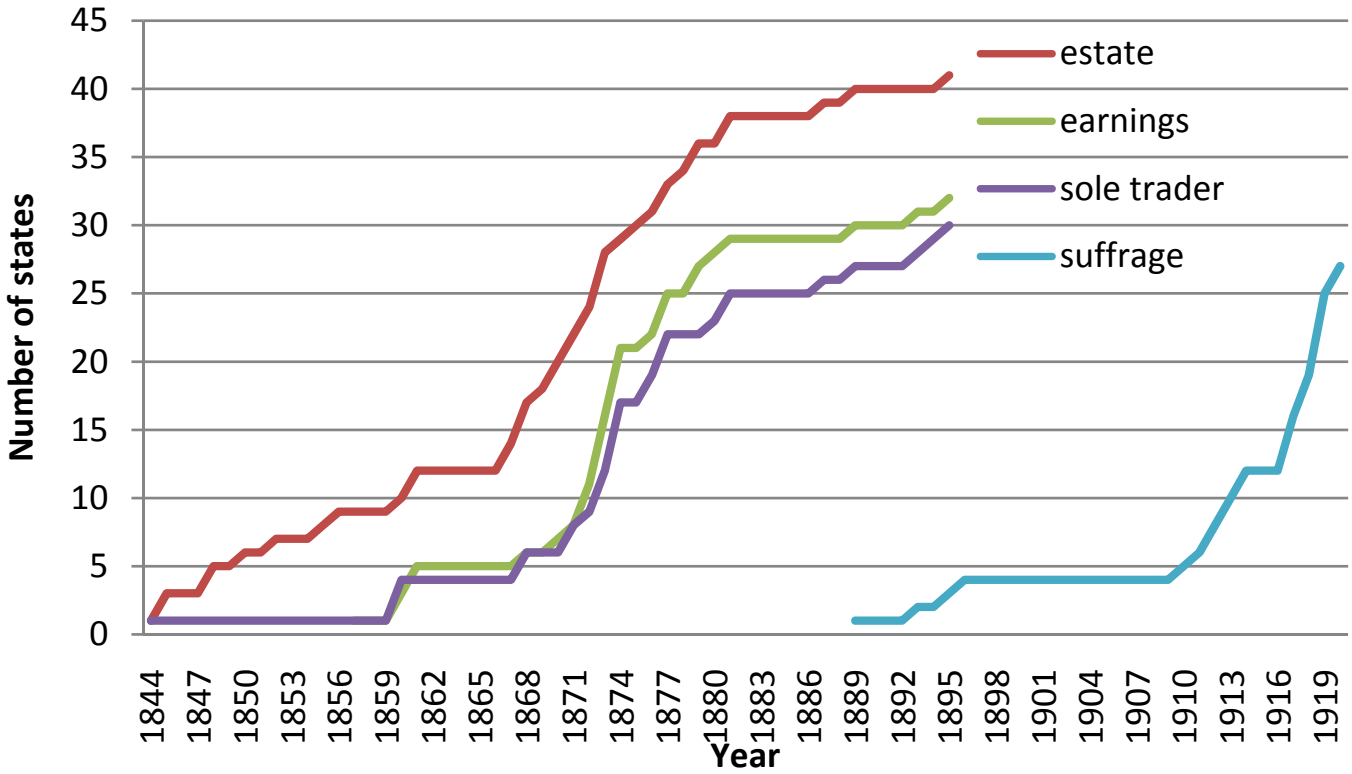
Work Hours, 1700-1989

Modern Work Hours

Work hours per week in the United States, 2003

	Males		Females	
Time use category	High school grad or less	College educated	High school grad or less	College educated
Total market work	37.5	43.4	22.8	29.8
Total non-market work	13.7	13.9	24.1	21.4
Leisure	114.0	107.2	116.5	112.0
Annual hours of market work	1952.1	2256.3	1186.1	1550.6
Annual hours of total work	2661.9	2979.6	2438.8	2661.4

The Industrious Revolution and Female Economic Power



Was the Industrious Revolution a Permanent Shift?

So was the Industrious Revolution a permanent shift in the employment patterns of females?

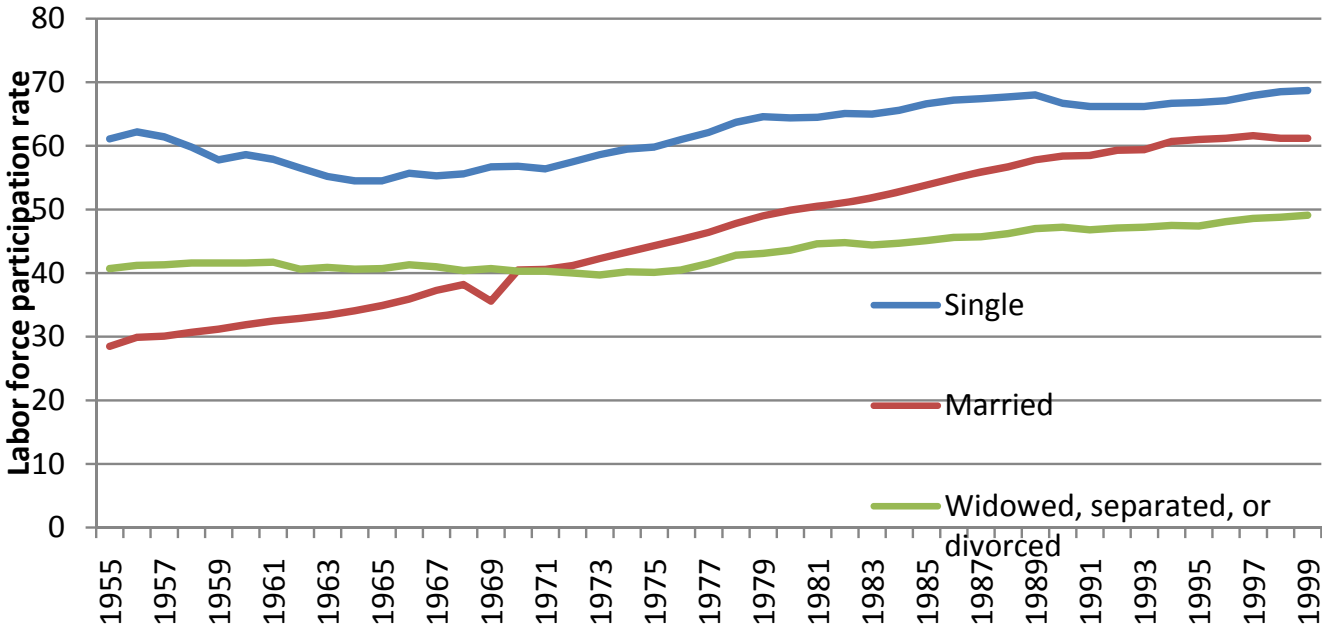
- Not necessarily
- Later in the 19th century, households reverted back to breadwinner-homemaker structure
- Wages and industry were still going up, so why didn't this just further Industrious Revolution trends?

Was the Industrious Revolution a Permanent Shift?

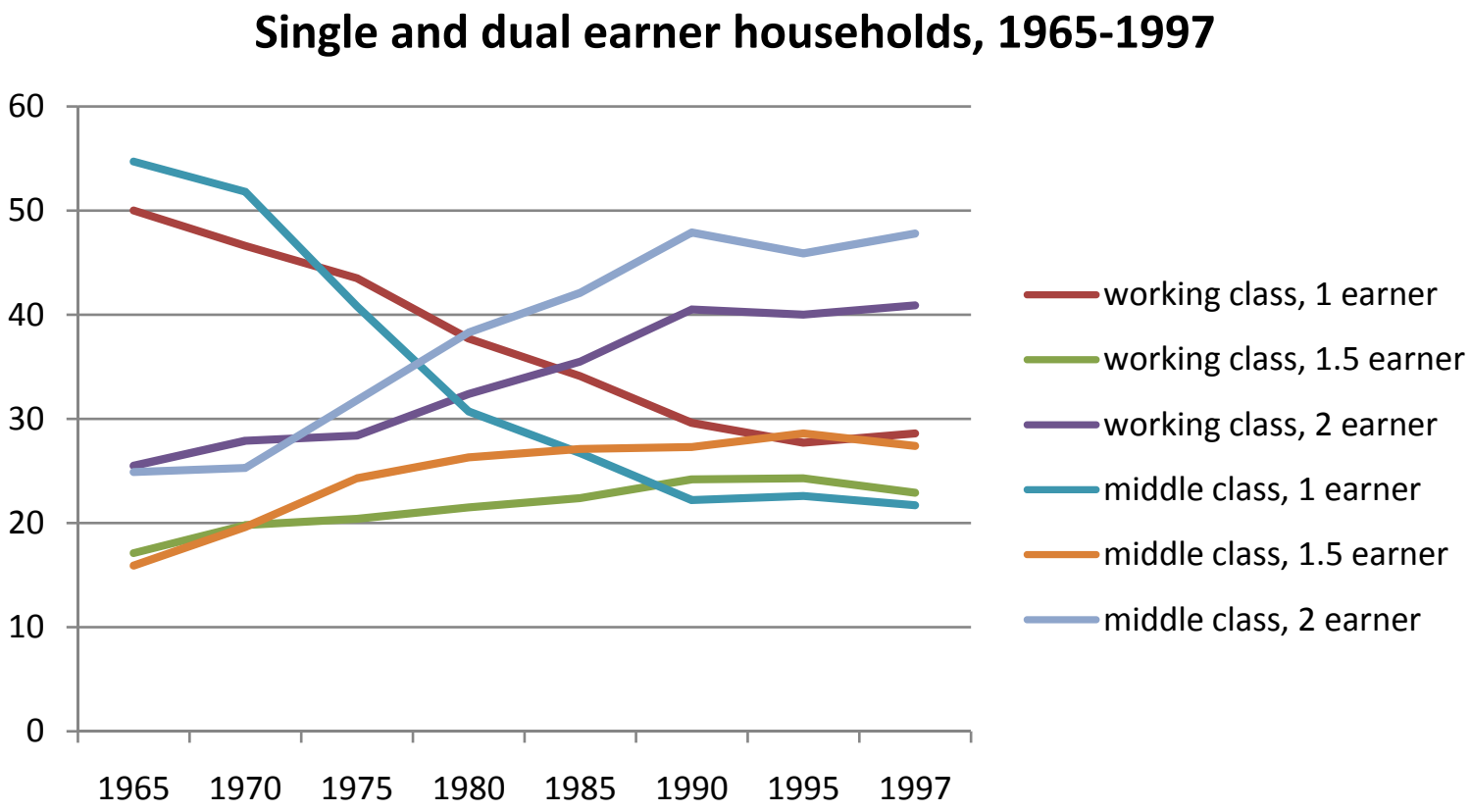
- New set of consumption goods emerged that required household time. Think nutrition, health and education of children as well as greater demand for enjoying the comforts of home
- No real market good substitutes for these things. (Did increase demand for complementary goods: plumbing, furniture, etc.)
- As male wages rose, women and children withdrew from the labor force
- Influx of immigrants may have also influenced demand for female labor in the US
- May be going through another change in the latter half of the 20th century, back toward two-earner households and greater reliance on market goods than household time-intensive goods

Women Reenter the Workforce

Women Reenter the Workforce



Women Reenter the Workforce



Children in the Workforce

WANTED!

120 Girls & Boys!

Owing to the inability of the Mills, to supply the Government with

TENT CLOTH,

(So much needed by our Soldiers now in the field,) as fast as wanted, the Managers of

THE BATES MILLS,

Have been induced to run their Machinery Extra Time, in order to supply in part, the wants of the Government, therefore the above number of hands can obtain employment at the Bates Mills, to do the following work, viz.

Twisting, Spooling, Spinning, Doffing and Quilling. They will be required to work 9 hours per day.

D. M. AYER, Agent.

Lewiston, October 16, 1861.

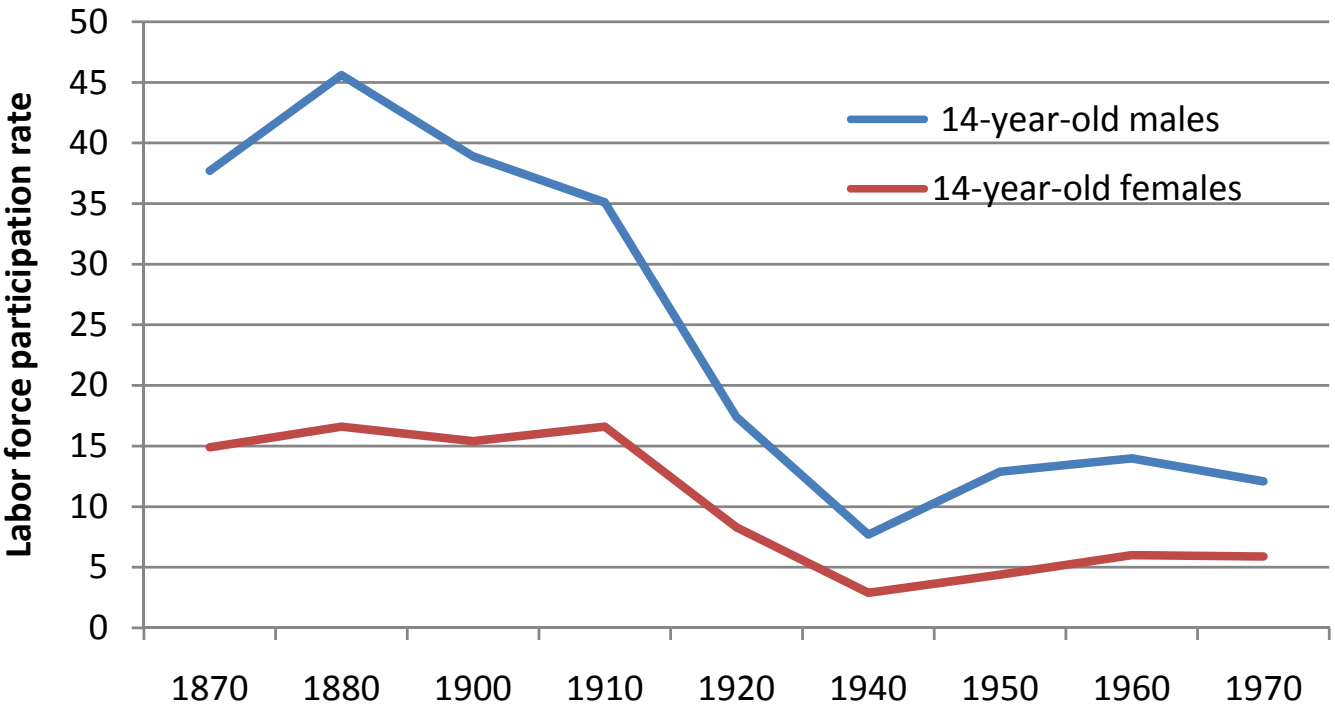
Industrialization and the Labor Force

Children in the Workforce

Richard Wakefield, on the irrationality of parents, 1802:

> *Parents in general from whom to take for time the idle, mischievous, least useful and most burdensome part of their family to bring them up without any care or expense to themselves in habits of industry and decency is a very great relief; are very much adverse to sending their children to the houses of industry; from what cause, it is difficult to tell.*

Children in the Workforce



The Decline of Child Labor

- Child labor was a prominent feature of the industrialization of the United States
- Child labor was also common in the agricultural sector
- By 1890, household expenditures were peaking when the household head was in his fifties even though his income peaked in his thirties
- If income from children was so important to households, why did child labor decline?

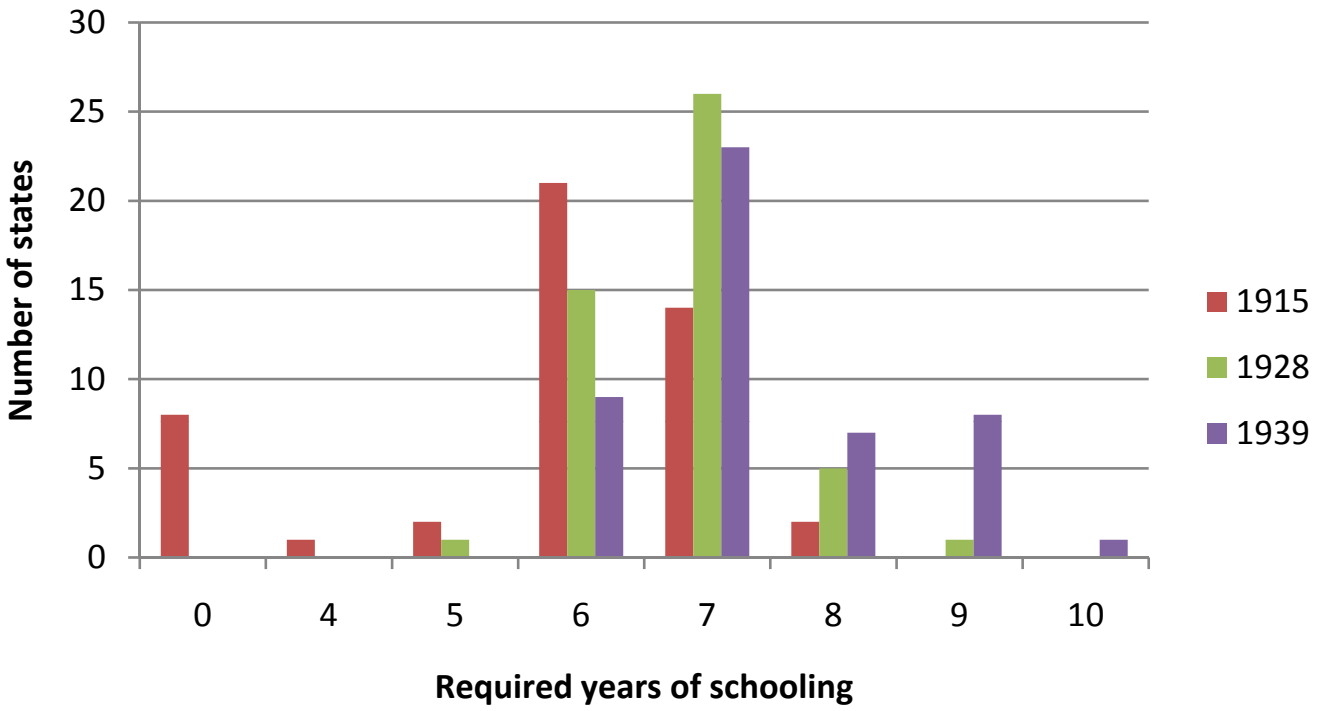
The Decline of Child Labor

- One explanation is political pressure
- For the sake of the kids: people protested the exploitation of child labor and the use of children in low paid, grueling and at times dangerous work
- For the sake of the adults: people weren't too excited about competing with children for jobs and having their wages pulled down by cheap child labor
- Calls to restrict child labor get louder through the late 1800s and early 1900s
- Several pieces of legislation are passed limiting child labor

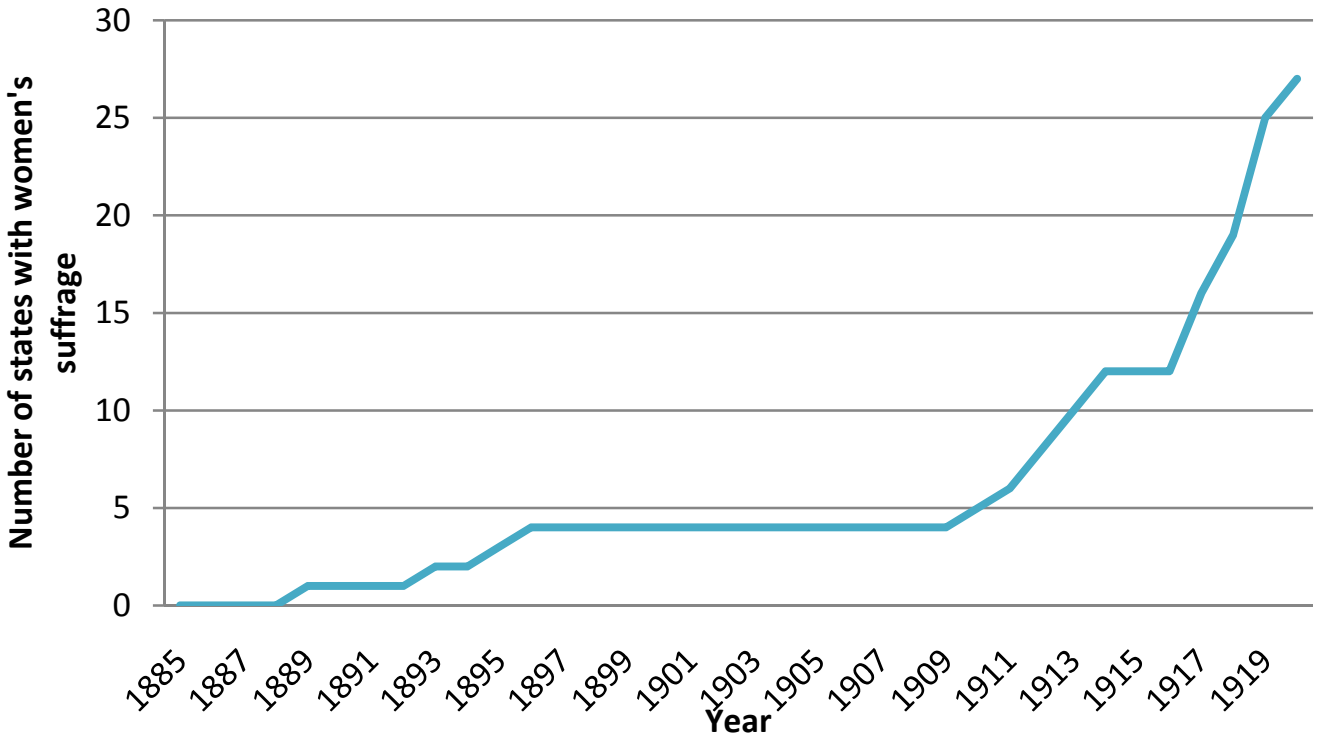
The Decline of Child Labor

The Decline of Child Labor

The Decline of Child Labor



The Decline of Child Labor



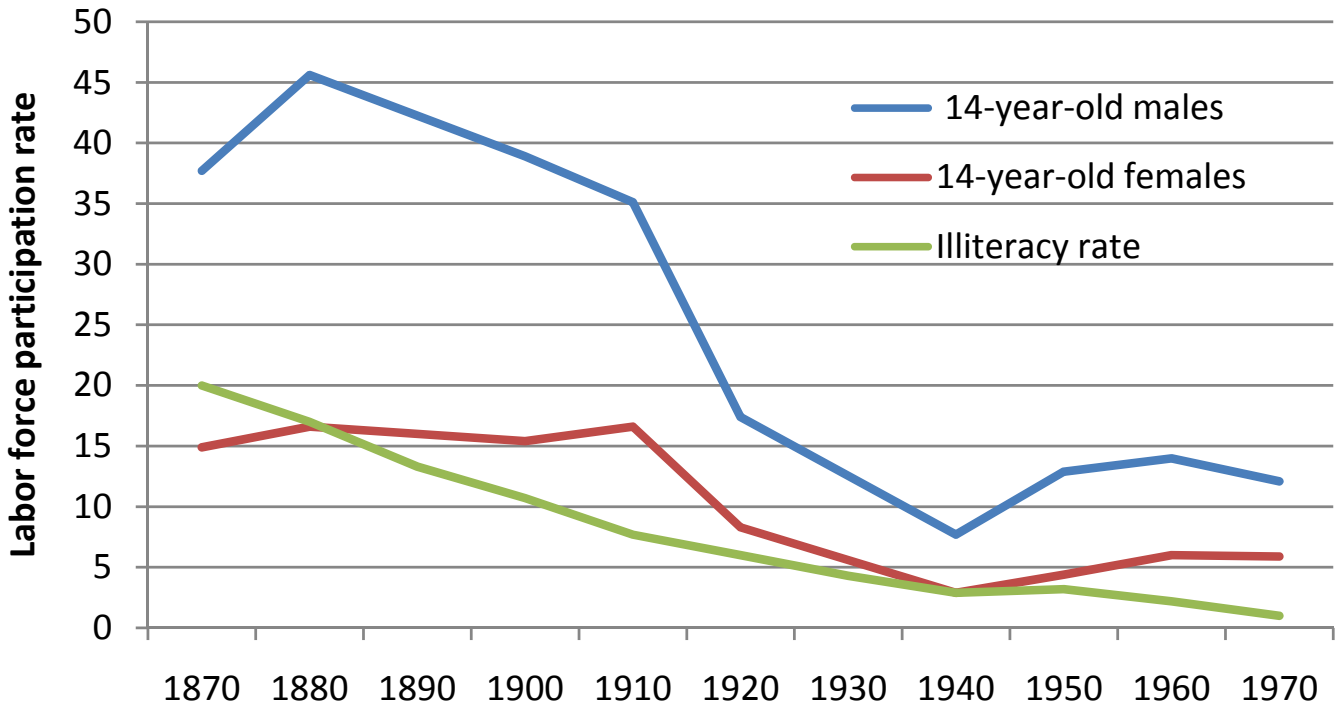
The Decline of Child Labor

- But there is a problem with the political pressure story
- The data suggests that child labor was already on the decline before much of this legislation
- Furthermore, states that banned child labor in specific industries saw child labor decline in those industries but also in other industries
- It seems that a large part of the decline in child labor was coming from families deciding not to have their children work

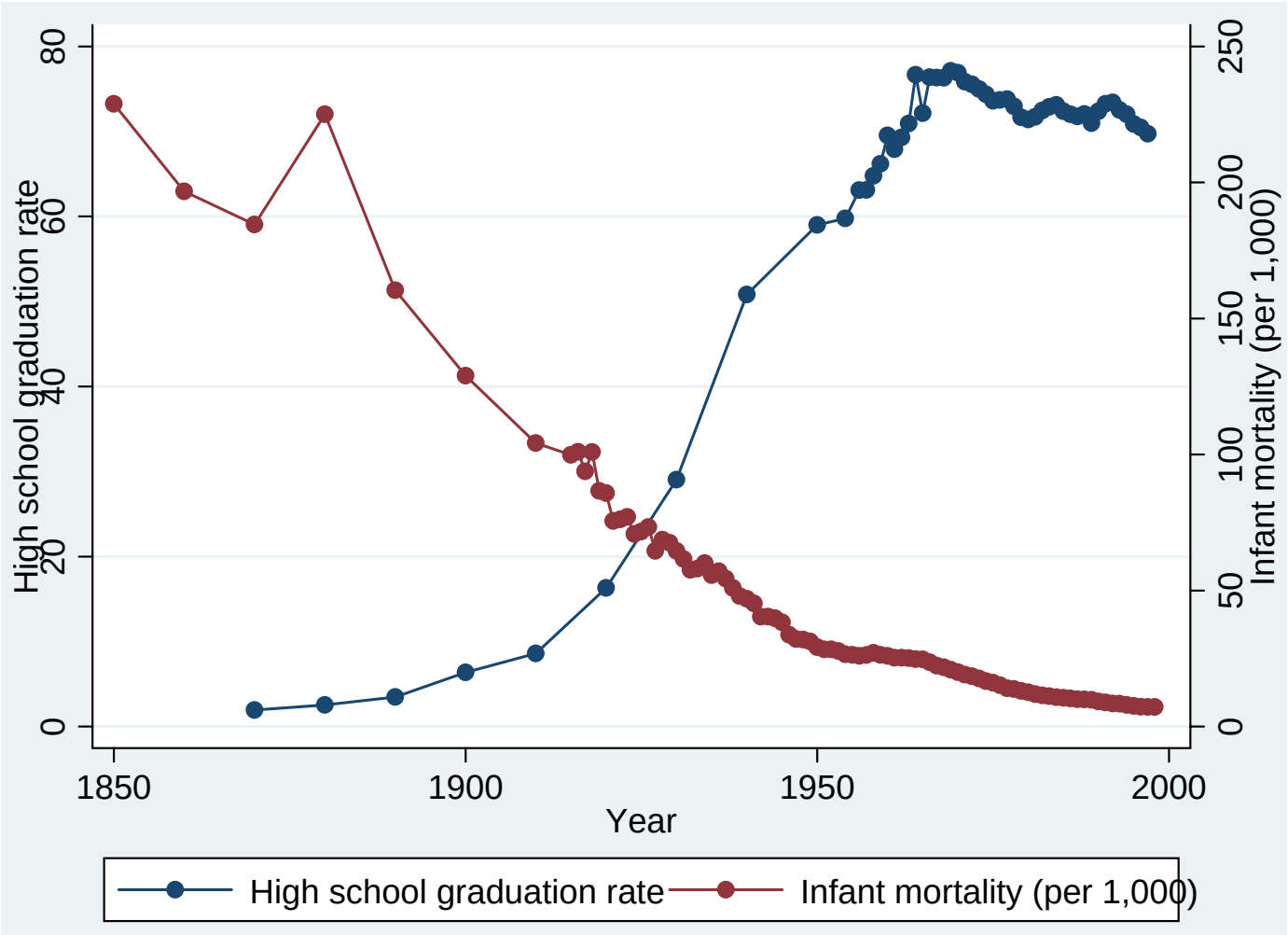
The Decline of Child Labor

- So why would families change their minds about sending their kids off to the mines and factories?
- One reason could be the same as De Vries's argument about the withdrawal of adult females from the labor force
- As incomes go up, families can afford to keep kids out of the labor force and instead spend/invest more time with them
- A related reason is the rising importance of investments in human capital

Human Capital Investment and the Decline of Child Labor



Human Capital Investment and the Decline of Child Labor



The Rise of an Educated Workforce

- In the early 20th century, children were spending less time in the workplace and more time in school
- The first decades of the 20th century saw an enormous transformation of the educational system
- The number of schools rapidly expanded and the nature of what was taught in those schools changed
- What we think of as high school today was an early 20th century innovation

The Transformation of American Schools

The Transformation of American Schools

The Transformation of American Schools

- In a movement led by the Midwest, graded schools and high schools began to emerge in the first decades of the 20th century
- Rather than getting all of your education in a common school, individuals (in both urban and rural areas) had access to more modern schools
- The nature of what was taught was also changing
- High schools were originally preparing students for college entrance with a classical and Latin-scientific curriculum
- Gradually the curriculum changed to be more practical for individuals not necessarily pursuing college

CURRICULUM OF THE PETERSHAM HIGH SCHOOL

[*a*, *b*, and *c*, placed after a subject, indicates first, second, and third term, respectively.]

College preparatory course		Academic course		Short course	
Subjects	Hours per week	Subjects	Hours per week	Subjects	Hours per week
		First Year			
Algebra	4	Algebra	4	Algebra	4
English	2	English	2	English	2
Ancient history	3	Ancient history	3	Ancient history	3
Elementary physics	3	Elementary physics	2	Elementary physics	3
Spelling 5		Book-keeping	3	Book-keeping	2
Drawing 2		Spelling 5		Spelling 5	
Music 2		Drawing 2		Drawing 2	
Rhetoricals 1	3	Music 2		Music 2	
Latin	4	Rhetoricals 1	3	Rhetoricals 1	3
		Agriculture 2 (boys)		Agriculture 2 (boys)	
		Domestic science 1 (girls)	2	Domestic science 2 (girls)	2
Total	19	Total	19	Total	19
		Second Year			
Geometry	4	Geometry	4	Geometry	4
Elementary chemistry	3	Elementary chemistry	3	Elementary chemistry	3
Spelling, music, etc.	3	Spelling, music, etc.	3	Spelling, music, etc.	3
English (*a*)		English (a)		American history (*a*)	
English history (*b*, *c*)	3	English history (*b*, *c*)	3	Civics (*b*, *c*)	3
French or German	4	French or German	4	Physiology (*a*)	
Latin	4	Manual training	2	Botany (*b*, *c*)	2
		Agriculture 2 (boys)		Manual training	1
		Domestic science 1 (girls)	2	Agriculture 2 (boys) / Domestic science 1	2
Total	21	Total	21	Total	18

The Transformation of American Schools

		Third Year			
English	2	English	2	English	6
Spelling, etc	3	Spelling, etc	3	Spelling, etc	3
French or German	4	French or German	4	Chemistry (*a*)	
Biology (*a*)		Biology (*a*)		Trigonometry and Surveying (*b*, *c*)	4
Botany (*b*, *c*)	3	Botany (*b*, *c*)	3	Astronomy (*a*)	
Physiology (*a*)		Physiology (*a*)		Zoology (*b*)	3
Physics (*b*, *c*)	2	Physics (*b*, *c*)	2	Geology (*c*)	
Latin	4	American history (*a*)		Manual training	1
		Civics (*b*, *c*)	3	Agriculture 2 (boys)	
		Manual training	1	Domestic science 1 (girls)	2
		Agriculture 2 (boys) / Domestic science 1 (girls)	2		
Total	18	Total	20	Total	19
		Fourth Year			
English	4	English	4		
French or German	3	French or German	3		
Spelling, etc	3	Spelling, etc	3		
English (college requirements)	2	Astronomy (*a*)			
Latin	4	Trigonometry and Surveying (*b*, *c*)	4		
Chemistry (*a*)		Chemistry (*a*)			
Mathematical reviews (*b*, *c*)	4	Zoology (*b*)			
		Geology (*c*)	4		
		Agriculture (boys) / Floriculture (girls)	2		
Total	20	Total	20		

The Rise of an Educated Workforce

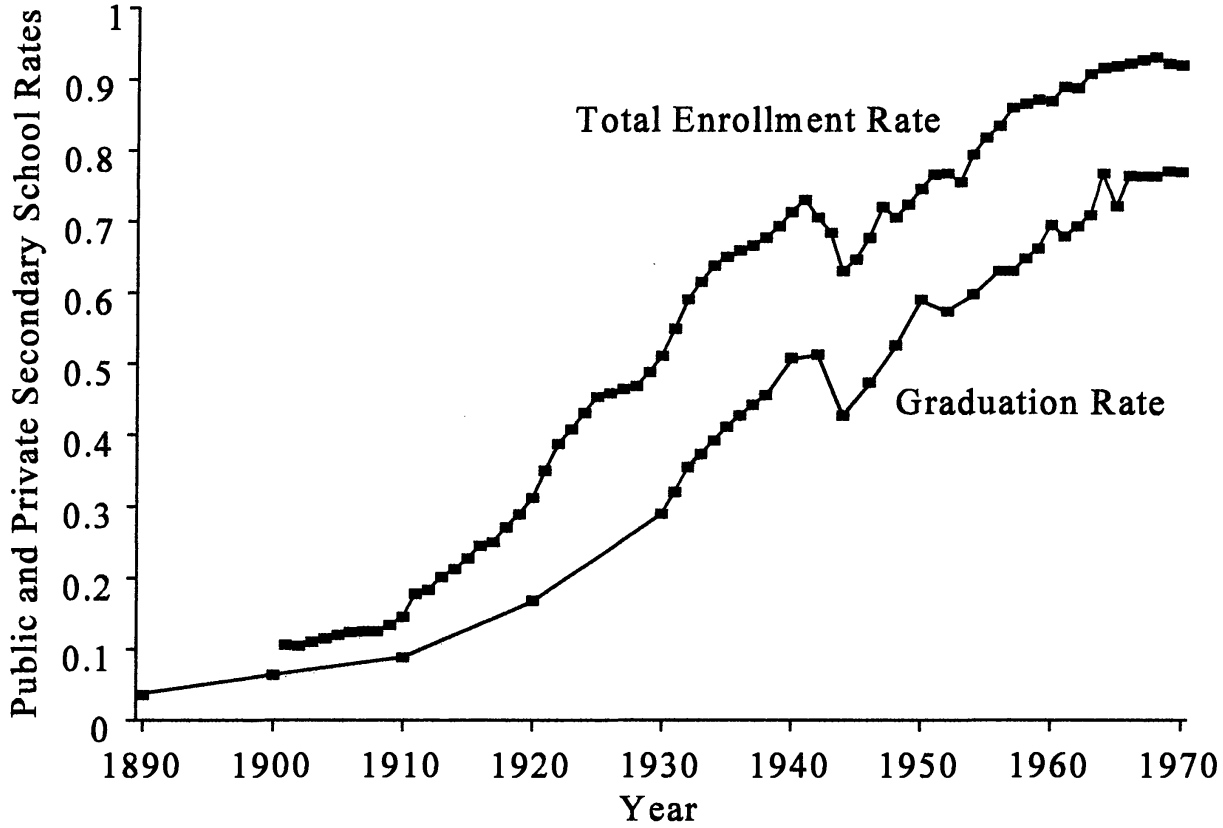


FIGURE 1
SECONDARY SCHOOL ENROLLMENT AND GRADUATION RATES:
ENTIRE UNITED STATES

What Drove Demand for Education?

WHEREAS,

Several EVIL-MINDED PERSONS have assembled together in a riotous Manner, and DESTROYED a NUMBER of

FRAMES,

In different Parts of the Country:

THIS IS

TO GIVE NOTICE,

That any Person who will give Information of any Person or Persons thus wickedly

BREAKING THE FRAMES,

Shall, upon CONVICTION, receive

50 GUINEAS

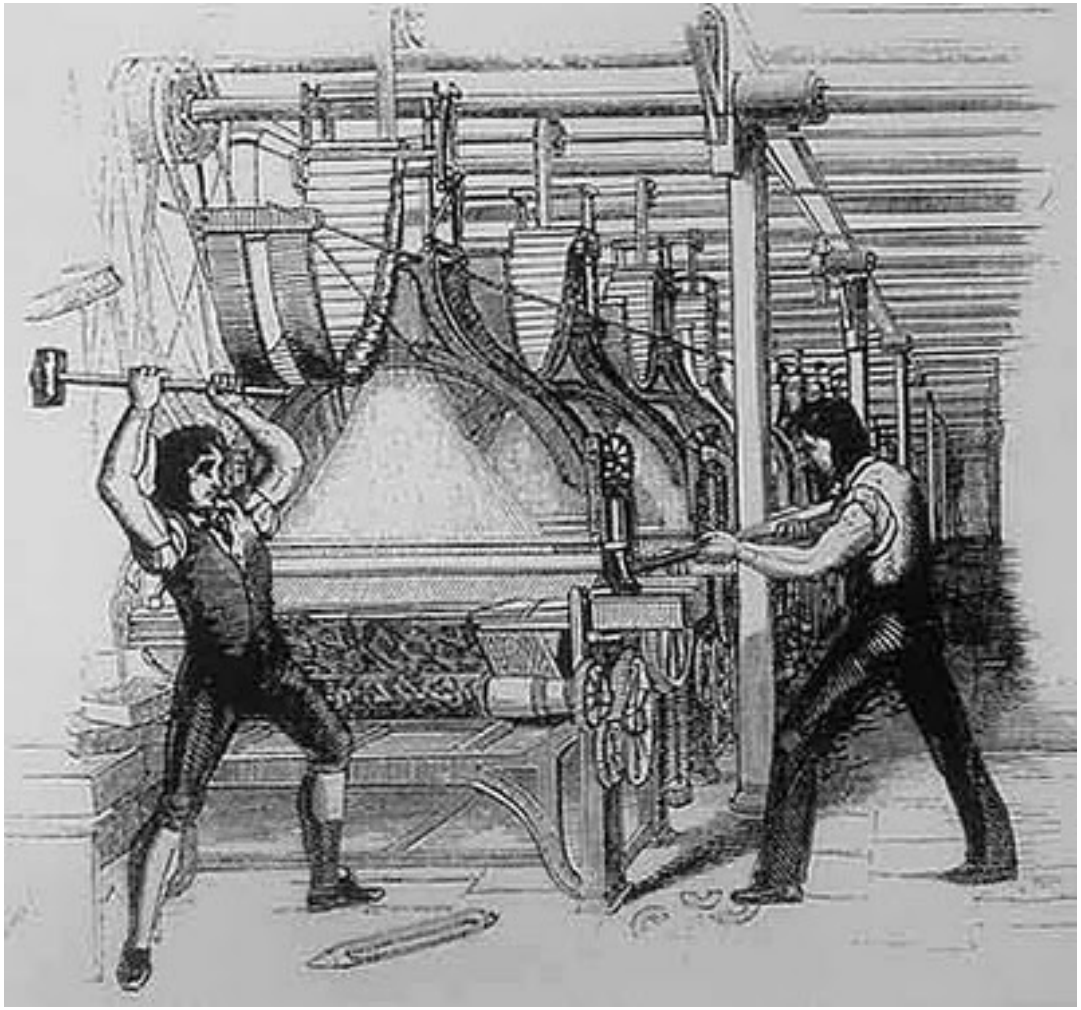
REWARD.

And any Person who was actively engaged in RIOTING, who will impeach his Accomplices, shall, upon CONVICTION, receive the same Reward, and every Effort made to procure his Pardon.

☞ Information to be given to Messrs. COLDHAM and ENFIELD.

Nottingham, March 26, 1811.

What Drove Demand for Education?



What Drove Demand for Education?

- So far, we've talked about industrialization replacing skilled workers with machines and unskilled workers
- This is why we see groups like the Luddites protest the early stages of industrialization (and some modern aspects of industrialization)
- It would seem then that industrialization increases demand for unskilled workers, not highly educated workers
- It turns out that this is only partially true

What Drove Demand for Education?

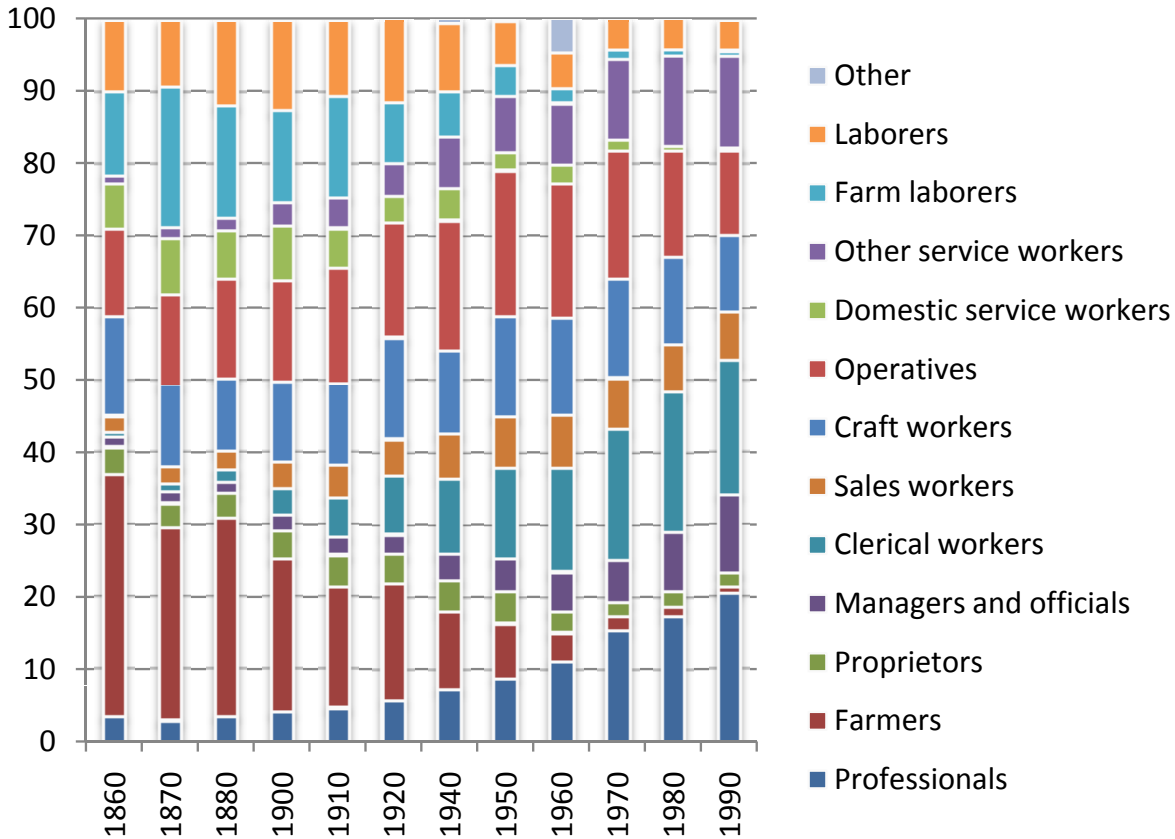
- Industrialization was causing a "hollowing out" of the occupational distribution
- It created unskilled positions (tending machines, assembly line work) and positions requiring highly educated workers (engineers, white collar workers, etc.)
- It did away with certain skilled blue collar jobs in the middle of the occupational distribution
- For the remaining blue collar jobs, education was becoming increasingly important
- As a consequence, the path to higher income increasingly depended on education

Capital-Skill Complementarities

TABLE II
PERCENTAGE HIGH SCHOOL GRADUATES BY INDUSTRY, 18 TO 34-YEAR OLD MALE BLUE-COLLAR WORKERS: 1940

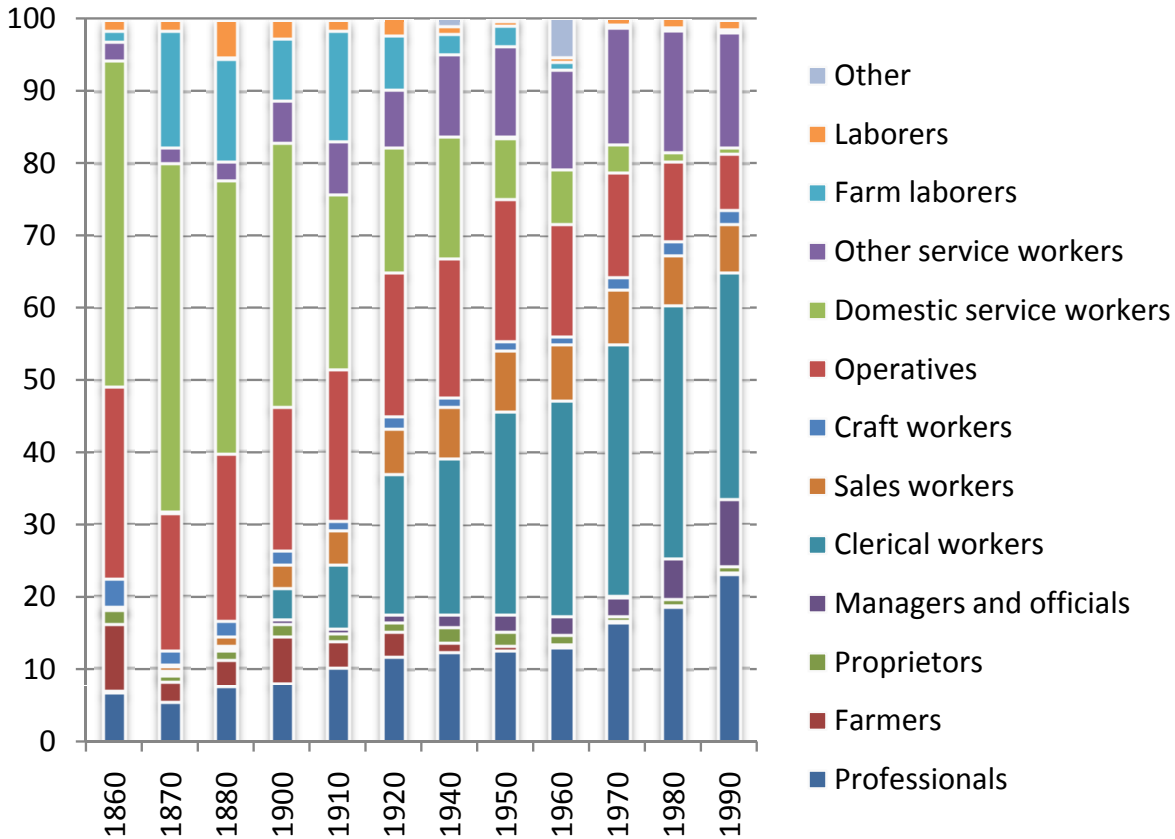
Three-digit SIC manufacturing industries	*% H.S. grad.*	*Number of obs.*	*Three-digit SIC manufacturing industries*	*% H.S. grad.*	*Number of obs.*
High-education industries (from high to low)			*Low-education industries (from low to high)*		
Top 20% by employment			*Bottom 20% by employment*		
Aircraft and parts	52.7	541	Cotton manufactures	10.8	1512
Printing and publishing	44.7	1289	Tobacco	11.6	144
Office machinery	43.7	166	Logging	11.7	706
Petroleum refining	43.3	415	Sawmills and planing mills	14.1	1941
Dairy products	43.2	417	Not specified textile mills	15.6	128
Scientific and photographic equipment	40.8	227	Silk and rayon manufactures	16.6	350
Electrical machinery	40.5	977	Carpets and rugs	16.9	107

Changes in the Occupational Distribution



Male Occupational Distribution Over Time

Changes in the Occupational Distribution



Female Occupational Distribution Over Time