



Université d'Ottawa | University of Ottawa

Département d'histoire | History Department

Faculté des arts / Faculty of Arts

## HIS 2129 B

### *History 2129: Technology, Society and Environment since 1800*

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### Mid-term Examination (March 6, 2015)

**Nota Bene:** Books, notes, and internet access not permitted. Mark what you believe is the best correct answer to the first two parts on the questionnaire as indicated. Use the booklet for the third part. At the end of the examination, place your questionnaire inside the booklet and hand BOTH in. You may wish to use a pencil for the first pass and a pen to finalize your answers before handing in your copy, but you are not obligated to do so. It is your responsibility to ensure that your answers are clearly indicated.

A) [20 points] Answer 20 of the following by indicating whether you consider the statement to be true (T) or false (F). If you answer more than 20, only the first 20 will be marked.

1) Since 1900, world statistics indicate that a given amount of a country's income per capita (in constant dollars) is always matched with the same average life expectancy at birth.

T      F

2) Bernward Joerges confirms that the parkway bridges of the Long Island, New York, were intended to control the access of the poor and minorities to Jones Beach.

T      F

*Turbine*

3) One of the questions asked by Langdon Winner is whether the intrinsic properties of some technologies might lead to specific political outcomes.

✓ **T**   **F**

4) For philosophers of Antiquity like Aristotle, the Greek word "technology" described a network of coordinated technical artefacts designed to fulfill a single, overarching purpose.

teche - art  
logos - speech

**T**   **F**

5) For most historians, 1859 would be a valid beginning date for the Industrial Revolution.

**T**   **F**

6) French scientist Denis Papin (1647-1713?) designed an early steam pump and even imagined a way of driving a paddlewheel boat with his invention.

✓ **T**   **F**

7) The origins of writing may be traced back to the early practice of keeping a count of various commodities with clay tokens, shaped or inscribed.

✓ **T**   **F**

8) Once the steam engine was invented, it quickly and completely displaced the watermills and windmills used formerly.

✓ **T**   **F**

9) The east-west axis of the Americas is longer than its north-south axis.

✓ **T**   **F**

10) According to scholars such as Jared Diamond, the more extensive domestication of animal species also leads to a healthier population as it increases the consumption of animal proteins and cuts the number of diseases. **F**

**T**   **F**

11) A river or lake cannot be part of a canal.

**T**   **F**

12) The Duke of Bridgewater built the first canal in England.

**T**   **F**

13) When British canal companies faced by the competition of the railways cut costs in the 19th century, many of their employees were forced to live aboard canal boats.

**T**   **F**

14) When it came to moving commercial goods, turnpikes (toll roads) enjoyed a large cost advantage over rivers.

✓ T  F

15) Between 1730 and 1760, boats were hauled upstream through the city of Paris by a machine using wind-power.

✓ T  F

16) By the late 19<sup>th</sup> century, Canada exported wood products such as lumber and potash to overseas markets.

✓  T F

17) By the beginning of the 20th century, the total length of Mexico's railway network surpassed that of Canada's railways.

T F

18) The ~~deadliest~~ railway bridge accident in Canadian history happened near Quebec City in 1907 when part of the bridge under construction collapsed.

✓ T  F

19) During their first decades of use in North America, most train engines burned charcoal.

✓ T  F

20) While the consolidation of railway lines in Canada was overseen by the federal government, much of the earlier consolidation of railway lines in the United States was organized by banker J. P. Morgan.

T F

21) The Atlantic Telegraph of 1858 was an optical telegraph system reliant on floating lightships as signal relays.

✓ T  F

22) Menlo Park was the site of the research laboratory created by and for Thomas Alva Edison in Canada.

T F

23) More than one inventor was in a position to come up with the telephone before Bell, but none of them could make telegraph companies see the interest of an invention that transmitted only one human voice at a time.

✓  T F

24) By 1849, Canadian inventor Abraham Gesner had distilled kerosene from oil, to be used as an illuminant.

✓  T F

25) By 1900, the greatest source of mechanical work output in the United States was still animal (provided by horses, oxen, and humans).

X  T F

26) Past the midpoint of the twentieth century, the cultivation of cotton and tobacco remained almost as labour intensive as it had been in earlier centuries.

✓  T F

✓ 27) The first woman elected to the U.S. National Academy of Engineering trained as an industrial psychologist.

T F

Lillian Gilbreth

28) The Canadian farm equipment company Massey-Harris began selling tractors propelled by steam after World War I.

✓ T  F

gas

29) By 1920, there were fewer horses (or work animals in general) than tractors and trucks on U.S. farms.

✓ T  F

30) The famous husband-and-wife team of Frank and Lillian Gilbreth was best known for its use of cameras when it came to streamlining industrial work.

✓  T F

19/20

**B) [20 points] Answer 20 of the following by indicating which of the four (4) alternative answers is the correct one in your opinion. If you answer more than 20, only the first 20 will be marked.**

✓ 1) Which of the following is recognized as one of the first historians to put pen to paper?

- X  (a) Aristotle  
(b) Cicero  
(c) Herodotus  
(d) Plato

2) The consideration of technological systems by historians of technology may be credited to

- ✓  (a) Sam Hughes  
(b) Howard Hughes  
(c) Langston Hughes  
(d) Thomas P. Hughes

3) The data on the relationship of life expectancy and economic development (GNP per capita) demonstrate that

- (a) all wealthier countries have longer lifespans on average than poorer countries  
(b) all poorer countries have shorter lifespans on average than wealthier countries  
(c) since 1900, similar levels of economic development lead to similar levels of life expectancy  
(d) since 1800, the mean life expectancy has increased by the same amount in all countries

4) In English, the word *technology* has been used to designate the practical arts, taken collectively, since

- (a) the time of the Greek philosopher Aristotle
- (b) the word was first coined in a medieval encyclopaedia
- (c) the beginnings of the Industrial Revolution in the eighteenth century
- (d) the nineteenth century

5) After inventing his new type of steam engine (or pump), Thomas Newcomen went into business with:

- (a) Denis Papin, who had provided him with information about his earlier scientific experiments
- (b) John Smeaton, who had determined the efficiency of his new design
- (c) Thomas Savery, who owned a general patent on steam-powered pumping
- (d) James Watt, who found out how to make it more efficient

6) According to Jared Diamond, the large number of domesticated plant and animal species available in the Old World made it possible

- (a) to generate greater food surpluses
- (b) to develop populous, sedentary, and hierarchical societies
- (c) for more diseases to take hold of the human population
- (d) all of the above

7) What two minerals were abundantly available in England at the outset of the Industrial Revolution and proved essential to progress both in metallurgy and in power generation?

- (a) copper and charcoal
- (b) coal and iron ore
- (c) limestone and steel
- (d) coke and limestone

8) The five most important large mammals domesticated by humans are:

- (a) the horse, cow, pig, ~~dog~~, and cat
- (b) the horse, cow, pig, sheep, and ~~chicken~~
- (c) the horse, cow, pig, sheep, and ~~dog~~
- (d) the horse, cow, pig, goat, and sheep

9) What two Canadian canals were improved several times over the years due to their great commercial and/or industrial importance?

- (a) the Coteau-du-Lac canal and the Rideau Canal
- (b) the Ottawa-Rideau canal system and the Trent-Severn waterway
- (c) the Lachine Canal and the Welland Canal
- (d) the Mattawa Canal and the Welland Canal

10) The 19th-century roads comprising three layers of crushed rock (of coarser and coarser grade going from top to bottom) compacted with heavy rollers are usually associated with the name of

- (a) Thomas Telford
- (b) John Smeaton
- (c) Samuel Smiles
- (d) John L. MacAdam

11) The great canal whose success in connecting western rivers to the eastern seaboard of the United States (and especially the cities along the Hudson river, from Albany down to New York) triggered a canal boom was known as:

- (a) the Chesapeake to Ohio canal
- (b) the Potomac canal
- (c) the Middlesex canal
- (d) the Erie canal

12) Canals most facilitated the Industrial Revolution, both in England and in the United States, by

- (a) helping workers commute between residential suburbs and factories downtown
- (b) reducing the cost of transporting raw materials, such as coal
- (c) bringing drinking water into the newly burgeoning cities
- (d) expanding the habitat for fish species used as a fertilizer source

13) In 1790, John Fitch's *Steamboat* running on the Delaware River between Philadelphia and Trenton could not compete profitably with

- (a) barges
- (b) canoes
- (c) sailboats
- (d) stagecoaches

14) Canada's first engineering degree was awarded in 1858 to a student from

- (a) Queen's University in Kingston
- (b) the University of Ottawa
- (c) the University of Toronto
- (d) McGill University in Montreal

15) Two factors accounting for the greater expansion of the U.S. railway network by 1850 (compared to Great Britain or France) are, in the United States:

- ~~(a) the flatter terrain, the lower price of coal~~
- (b) a larger population and lower labour costs
- (c) the lower cost of steel, the need to move Western cattle
- (d) the lower price of land, the absence of national boundaries

16) In the 19th century, early North American locomotives mostly burned

- (a) charcoal
- (b) coal
- (c) firewood
- (d) diesel oil

17) The Scottish-Canadian engineer who pushed for the adoption of a uniform time system, as much for railway schedules as for the rest of world affairs, was

- (a) Alexander Graham Bell
- (b) Robert Mackenzie
- (c) John A. Macdonald
- (d) Sandford Fleming

18) The first aerial (or optical) telegraph line in what is now Canada began operating in:

- (a) 1738
- (b) 1768
- (c) 1798
- (d) ~~1828~~

19) In 1888, the city-wide distribution of electric power to streetcars was demonstrated for the first time by

- (a) Thomas Ahearn and Warren Soper in Ottawa, Ontario
- (b) Thomas Alva Edison in Orange, New Jersey
- (c) Frank J. Sprague in Richmond, Virginia
- (d) George Westinghouse in New York, New York
- (e) Nikola Telsa in Belgrade, Serbia

20) A telegraphic cable connection was permanently established between North America and Europe, using the Atlantic Ocean seabed, in:

- (a) 1850
- (b) 1858
- (c) 1866
- (d) 1874

21) In 1850, 65% of oil and gas illuminants in the United States originated from

- (a) coal
- (b) petroleum and bitumen deposits
- (c) beeswax
- (d) whale blubber

22) During the last third of the 19<sup>th</sup> century, wheat production in the United States

- (a) fell while yields grew
- (b) increased faster than yields
- (c) did not increase as fast as yields
- (d) fell as a result of falling yields

23) Around the turn of the 20<sup>th</sup> century, Canadian cities were able to grow larger and healthier as a result (among other things) of

- (a) the widespread adoption of electric refrigerators X
- X (b) the widespread adoption of electric cars and delivery trucks
- (c) the switch to gas lighting
- (d) the prohibition on raising animals such as cows, pigs, or hens for food within city limits

24) Frederick Winslow Taylor (1856-1915) was an enemy of soldiering because

- ✓ (a) he believed endless drills and parades weakened the United States armed forces
- (b) he refused to accept the ordering of workers in factories as if they were mere soldiers
- ⊙ (c) he considered as a partial theft the efforts of workers to work as little as possible
- (d) he didn't want workers to be enrolled in the army and turned into soldiers

25) In the 19th century, the conversion of pig iron into mass quantities of steel in furnaces faced a major challenge when dealing with many available iron ores:

- X (a) the removal of the silicon present in those ores
- (b) the removal of the phosphorus present in those ores
- ⊙ (c) the addition of carbon to the molten metal
- (d) the instant heating of large quantities of metal

12/20

**C) [10 points] Answer 2 of the following in the booklet provided. If you answer more, only the first 2 answers will be marked.**

1) Explain the nature and importance of a "reverse salient" in a technological system as defined by Hughes. Illustrate with an example.

2) Identify the essential features of the transformation in power technologies during the eighteenth century, at the outset of the Industrial Revolution. 1700

3) Name and describe briefly three (3) classes of innovative (and mostly new) mechanical solutions to the challenge of upstream navigation that were explored in the 18th and 19th centuries. 1770

4) What were some of the very concrete and obvious features of the Chicago meat-packing system. Name at least four (4). Elaborate as needed.

5) Identify three (3) areas where the introduction of electricity started to make a difference by the end of the 19th century, heralding the replacement of the older technologies characteristic of the Industrial Revolution. Briefly describe the nature of the electrical innovation in each area. Finally, in each case, identify at least one (1) of the older technologies that were displaced by the advent of electrical technologies.

6) Name three (3) successive power sources used in the history of Canadian farm machinery during the last half of the 19th century and the first half of the 20th century. Give two (2) specific examples (total) of their use in farming. 1800 ————— 1900

6/10