

Midterm - INTD262

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1 Unit 3

- Recall the fascinating story about psychological research, in which the author shares that 67 percent of psychologists who were asked to share their data did not share it. (a) Were the rates of error higher or lower in the studies for which the authors did not share data? (b) In whose favor were the errors?

a) The rates were higher, but it does not specify by how much.
b) The errors were in favor of the authors, a 67% confirmation bias

- "Recent research in behavioral economics has shown that groups are often better than individuals at finding errors in reasoning." (a) Why do you think this is the case? (b) Can you give an example of the wisdom of crowds thus far in our study of Latin American science?

a) Groups are better than individuals because they can challenge each others thinking and

b) An example of wisdom of the crowds is the creation of scientific journals that allowed for sharing of information and collaboration during various scientific movements in Latin America.

- Recall the story of cold fusion. (a) List three facets of the peer review process that went wrong in this episode. (b) How long, from start to finish, did it take for the scientific community to sort out the errors in the cold fusion research?

a) 1) They went to the public with their findings before peer review happened. 2) It was irreproducible. They didn't share data and methods, radiation was not found again. 3) It was published without peer-reviews, later when it was published with reviews they disagreed with the findings.

b) It only took about 2 months to be sorted out

- Note that we encountered several examples of viceregal engineers becoming Latin American leaders. (a) What are some examples of professions that involved modern technical skill in Río de la Plata and Perú? (b) What is the primary profession of modern US leaders, for example, elected to The United States Congress?

a) Mining (especially mercury), geography / cartography, sailing

b) Most elected leaders are congress are lawyers by trade.

- José Mariano Mociño and others were ordered by the Mexican viceroy on an expedition to Nootka Island. What was the purpose of the expedition? (Take INTD255 to learn more!)

They sought to discover and study the natural wealth of the North near the borders of the Russian Empire.

- In Perú, we must take note of the work of Hipólito Unánue. (a) What are some of his other scientific contributions? (b) In Nueva Granada, we must take note of the work of José Celestino Mutis. What are some of his main contributions?

a) He was a botanist who helped modernize medicine in Perú with the coca plant and the Anfiteatro Anatómico.

b) He was a mathematician who contributed to modern math and physics in Nueva Granada and was apart of the Expedicion Botanica.

- (a) When did Latin American wars of independence begin, approximately? (b) Give some examples of scientists and engineers who fought and died for their countries.

a) The Latin American wars of independence began at the beginning of the 19th century.

b) Francisco José de Caldas, a naturalist, took part in a rebellion and was later executed. A group from Seminario de Minería was also martyred.

2 Unit 4

1. How long after Semmelweis's solution to childbed fever was germ theory introduced?

Germ theory was introduced about two decades after Semmelweis's solution

2. Where did the practice of autopsies begin? In what way does performing an autopsy fit with the scientific attitude?

The practice of autopsies began in Paris. It fits with the scientific attitude because they were first used to corroborate bedside diagnoses and provide data to confirm or refute original hypotheses.

3. (a) Do you think the discovery of penicillin was an accident? Why or why not? (b) Louis Pasteur is quoted as saying "chance favors the prepared mind." What did he mean by this? (c) In light of (a) and (b) do you regard the discovery of cinchona as accidental or scientific?

a) I do not think the discovery of penicillin was luck. I think its development was started from a happy accident but the scientists who discovered had the correct knowledge to actually develop penicillin. b) He meant that if one has knowledge then if a coincidence happens they are able to more fully take advantage of it. c) I think that discovery of cinchona was scientific that was spurred by an accident.

4. What event catalyzed the formation of the Establecimiento de Ciencias de Médicas in 1833?

The liberal reforms of the war of independence led to the creation of the Establecimiento de Ciencias de Médicas.

5. (a) List some reasons the authors give to explain why medical reforms were slow to materialize in Nueva Granada, relative to the struggle for reform in Nueva España. (b) Who led the medical reform process in Nueva Granada in the 18th century? (c) When and where was the Facultad de Medicina reestablished in Nueva Granada, and what happened next?

a) Low population density and low productivity as a kingdom.
b) José Celestino Mutis was a key figure in introducing modern medical ideas.
c) It was reestablished in the Colegio del Rosario in 1802 and it closed in 1810 for the war after the war, new French ideas of anatomical/clinical were introduced.

6. (a) How many medical schools were there in Brazil in the eighteenth century? (b) What happened to the Portuguese Crown in 1807? What influence did this have on medical reform?

a) There were NO medical schools until the end of the century.
b) The Portuguese Crown moved to Brazil which led to medical education becoming more of a priority.

7. As the generation of doctors in Columbia returned from France in the late 19th century, what three cultural institutions did they establish to enhance medical practice?

1 Medical Associations were formed
2 Scientific publications such as La Lanceta & La Gaceta Médica de Colombia
3 Medical schools such as Escuela de Medicina became more robust.

8. Triangulation Suppose you observe a distant mountain from a flat plain. Suppose you walk a baseline of 1 km, perpendicular to the direction towards the mountain. The difference between the compass headings to the mountain at either end of the baseline is 5 degrees. How far away is the mountain?

$$5^\circ = .09 \text{ radians}$$

$$d = \frac{b}{\theta} \quad d = \frac{1000 \text{ meters}}{.09} = 11,111.1 \text{ meters}$$

$$\boxed{11.1 \text{ Km}}$$

9. Latitude and Longitude (a) Suppose two cities lie along a constant line of longitude. If we measure a change of 30 minutes (0.5 degree latitude) between them, how far apart are they, in km? (b) Suppose two cities lie along a constant latitude of 45 degrees North. If they are 600 km apart, what is the change in longitude between them?

a) $s = R\theta \therefore s = 6371 \cdot .008 \quad \boxed{s = 55.6 \text{ km}} \text{ apart}$

b) $s = R \cos \theta \quad 600 = \phi \cdot 6371 \text{ km} \cdot \cos\left(\frac{\pi}{4}\right) \quad \phi = \frac{600}{6371 \cdot \cos \frac{\pi}{4}} = 0.43318$

$$45 \cdot \frac{\pi}{180} = \frac{\pi}{4}$$

$$\boxed{= 7.63^\circ \text{ degrees apart}}$$

3 Unit 5

1. (a) When were the first medical journals published in Columbia? (Give a few examples). (b) Compare this time frame to the publication of the first mining, chemistry, and physics journals in Mexico. (c) How, or through whom, were these journals connected to medical schools in Columbia?

a) 1864 - La Gaceta Medica, 1852 La Lanceta
b) Compendarios a las ordenanzas de minas - 1761 - about 100 years before medical journals
c) Antonio Vargas Reyes (1865 - turned scientific medical knowledge into teachable curriculum.

2. In 1833, two Enlightenment period institutions were merged into the beginnings of a modern medical school in Mexico. What were the three institutions?

1. Facultad de Medicina +
2. Real Escuela de Cirugia
3. Establecimiento de Ciencias Medicas

3. Consider our major in kinesiology and nutrition science (KNS). To what extent would we consider this medicine, in the absence of modern germ theory? That is, are there other holistic forms of medical development we encountered in Latin American history besides vaccines and drugs that fight bacteria and viruses?

In the absence of modern germ theory, KNS would be considered quite medical. We learned about different herbal remedies that were used in Latin America - obviously there is cinchona bark for malaria, but others like cacao were also used for various purposes.
4. (a) What historical event in 1808 led to the creation of the first medical and surgical schools in Brazil (b) When did Brazil declare independence from Portugal? (c) How long after independence did the Brazilians introduce modern reforms into the medical schools in Bahia and Rio de Janeiro?

a) the Portuguese court moved to Rio de Janeiro.

b) 1822, Sep 7

c) Modern reforms were introduced 7 years after independence.

5. In Columbia, the Escuela de Medicina was founded in 1865. It was centered on hospital-based anatomy and physiology. Consider the following quote from the text: "The second phase is notable for the slow progress of laboratory-based medicine, especially etiopathological procedures. Its final stage, starting in the 1950s, is defined by the introduction of Flexnerian reforms from North American technological medicine." What does quote mean by Flexnerian? Think back to our reading in The Scientific Attitude.

The term Flexnerian is used to specify to reforms that came after the Flexner report. In which Abraham Flexner found that many if not most medical schools in the U.S. had inadequate facilities to meet the national standards of education.

6. (a) What was a major driver of modern epidemiology in 19th Century Brazil? (b) What was the purpose of the Tropicalist School of medicine? (c) When did the bubonic plague enter Brazil, and how did the Brazilians respond?

a) Interest in tropical epidemics

b) To investigate tropical epidemics

c) The bubonic plague entered Brazil in 1899 spread by sea travel from rats. Dr. Oswaldo Cruz had the development of a vaccine