

Kamariina Hewitt

Midterm - INTD262

Dr. Jordan Hanson - Whittier College Dept. of Physics and Astronomy

December 6, 2024

1 Unit 3

1. 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) higher

(b) in favor of researchers hypothesis

2. "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) more + different perspectives, can challenge each other, offer alternate interpretations, more discussion + scrutiny

(b) collaborative expeditions to Latin America → different ppl interpreting mythology, getting the facts, finding uses for regions flora

3. 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) lack of replicability, lack of scrutiny of results before publication, publication before results verified

(b) 10 years? became clear early on that experiment could not be replicated

4. 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) military officers, engineers, architects, surveyors, miners

(b) usually law, politics, + business

5. 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!)

gather geographical + botanical information - explore, collect + map data
ingrains, strengthen Spanish territory control

6. 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) medicine, math, medical botanical knowledge - Academia Nacional de medicina de Perú

(b) Royal botanical expedition + integration of indigenous knowledge

7. (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) early 1800's

(b) Juan Castelli, Andrés Bello, Simón Bolívar

2 Unit 4

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

~20-25 yrs I think

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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, France. Testing theories, changing theories based on evidence, reliance on evidence

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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) yes, initially unexpected/accidental, was not initially trying to discover penicillin, but experimentation + observation changed his focus
(b) accidents happen, but ppl must have the scientific curiosity to explore them further
(c) yes -> had the curiosity to explore further w/out knowing exact use/case

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

Wars for independence, political + educational reforms needed to reorganize + centralize medical training/education

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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) political competition, smaller population, weaker institutional support, colonial priorities, etc.
(b) José Celestino Mutis? I think
(c) reestablished in Bogotá in early 1800s - development disrupted by wars of independence

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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) two
(b) fled to Brazil -> influence on medical reform: established + expanded medical schools + institutions

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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?

medical journals/publications, medical associations, + medical schools

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?

Diagram: A right-angled triangle with a vertical side of 1 km and a horizontal side of d . The angle at the bottom vertex is 5° . The hypotenuse is the distance to the mountain.

$$d = \frac{(\tan(5^\circ) \tan(5^\circ))}{(\tan(5^\circ) + \tan(5^\circ))} (1 \text{ km})$$

or small angle approximation: $\tan(\theta) \approx \theta$

$$\tan(\theta) = \frac{d}{0.5 \text{ km}} \Rightarrow d = 5(0.5) \text{ km}$$

$$d = 2.5 \text{ km?}$$

$d = 0.0437 \text{ km or } 43.7 \text{ m}$

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? $D = 0.5 \times 111 \text{ km} = 55.5 \text{ km}$

(a) 55.5 km

(b) 7.64 degrees

$S = R \cos \theta$
 $S = 600 \cos(45)$
 $\phi = \frac{600}{6371 \cos(45)} = 0.133$

or $111 \text{ km} (\cos(45))$
 78.5 km

$d = \frac{600 \text{ km}}{78.5 \text{ km/deg}} = 7.64 \text{ deg}$

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) 1852: La Lanceta, 1864: La Gaceta Medica

(b) 1761: Comentarios a las Ordinezas de Minas; published 100 years before medical journals

(c) 1865 - Dr. Antonio Vargas Reyes ^{JP} translated scientific progress into curriculum

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

made publications, medical associations, and medical schools
Real y Pontificia Universidad de Mexico, Escuela de Medicina, Real Academia de Medicina

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?

Would still be medicine → focus on movement, diet, balance (like humoral theory)
could use traditional medicine (coca leaves, cinchona, maize, etc.)

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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) arrival of Portuguese royal family

(b) 1622

(c) took a few decades

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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.

refers to adaptation of principles from report (standardized + science-based education + hospital based clinical training) shift from traditional to standardized research driven medical system that was more scientifically rigorous

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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) outbreaks of infectious diseases

181 ~ (b) Tropicalist school of medicine → investigated tropical epidemics

182 ~ (c) bubonic plague entered Brazil in 1899 (spread by sea travel from rats).

- isolated people, sanitization

- Oswaldo Cruz → led development of vaccine

- Promoted medical research