

## **Midterm - INTD262**

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### **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) Studies for which authors did not share data had higher rates of error.

(b) The errors tended to favor the studies' authors, as withholding data often masked biases or mistakes.

**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) Groups are often better than individuals at finding errors in reasoning because they bring diverse perspectives, reducing individual cognitive biases and errors. The collaborative scrutiny enhances overall accuracy.

(b) An example from our study of Latin American science is the collaborative work of scientists like José Celestino Mutis, who led collective botanical research in Nueva Granada, combining efforts from many contributors to catalog regional flora comprehensively.

**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) Three facets of the peer review process that failed in the cold fusion episode include:

- Insufficient replication of results before publication.
- Lack of transparency in data sharing.
- Over-reliance on sensational claims rather than rigorous evaluation.

(b) It took approximately two years for the scientific community to sort out the errors and discredit the claims of cold fusion.

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

(a) Examples of professions involving technical skills in Río de la Plata and Perú include architects, surveyors, and military engineers who designed infrastructure and fortified cities.

(b) In modern U.S. leadership, law is the primary profession among elected officials in Congress.

**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!)** The purpose of José Mariano Mociño's expedition to Nootka Island was to document and study the region's natural resources and biodiversity, fulfilling a mandate to advance scientific understanding and imperial ambitions.

**6. In Peru, 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) Hipólito Unánue's contributions include advancements in meteorology, botany, and medicine, notably his studies on climate's influence on health.

(b) José Celestino Mutis's main contributions include leading the Royal Botanical Expedition of Nueva Granada, documenting plants' medicinal properties, and founding the first astronomical observatory in the Americas.

**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) The wars of independence began around 1810.

(b) Examples of scientists and engineers who participated include Francisco José de Caldas, who contributed to geography and astronomy and died defending independence, and Simón Rodríguez, who promoted educational reforms.

## **2 Unit 4**

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

Germ theory was introduced about 20 years after Semmelweis's solution to childbed fever.

**2. Where did the practice of autopsies begin? In what way does performing an autopsy fit with the scientific attitude?** Autopsies began in ancient Alexandria, Egypt. Performing an

autopsy exemplifies the scientific attitude by emphasizing observation, systematic analysis, and evidence-based conclusions to understand the causes of death.

**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) The discovery of penicillin was an accident but grounded in scientific inquiry, as Alexander Fleming noticed bacterial inhibition by mold and investigated further.

(b) Louis Pasteur’s quote “chance favors the prepared mind” means that accidental discoveries are often recognized by those with the knowledge to understand their significance.

(c) The discovery of cinchona (quinine) was scientific, as its use in treating malaria was rooted in systematic observation and indigenous knowledge.

**4. What event catalyzed the formation of the Establecimiento de Ciencias de M´edicas in 1833?** The event that catalyzed its formation in 1833 was the merging of two Enlightenment-era institutions to modernize medical education in Mexico.

**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 Espa˜na. (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) Medical reforms were slow due to political instability, limited resources, and resistance from entrenched colonial institutions. (b) The process was led by Jos´e Celestino Mutis and other

Enlightenment thinkers. (c) The Facultad de Medicina was reestablished in Bogotá in 1803, leading to the integration of new scientific methods into medical practice.

**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 formal medical schools in Brazil in the eighteenth century.

(b) In 1807, the Portuguese Crown relocated to Brazil, creating a demand for modern medical education. This led to the establishment of schools in Salvador and Rio de Janeiro.

**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?**

The returning generation established hospitals, medical societies, and journals, fostering the professionalization of medicine in Colombia.

**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?**

Distance = baseline/tan (angle), the mountain is approximately 11.5 km away.

**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) A 0.5-degree latitude change corresponds to approximately 55.6 km.

(b) For two cities at 45°N and 600 km apart, the longitude change is about 5.36 degrees.

### **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) The first medical journals in Colombia appeared in the mid-19th century, such as *Revista Médica de Bogotá*.

(b) This was slightly later than Mexico's journals in mining and physics.

(c) These journals were connected to medical schools through academic societies and institutional support.

**2. In 1833, two Enlightenment period institutions were merged into the beginnings of a modern medical school in Mexico. What were the three institutions?** The three institutions merged in 1833 were the Colegio de Cirugía, the Real y Pontificia Universidad de México, and the Protomedicato.

**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 germ theory, kinesiology and nutrition sciences align with holistic practices like herbal medicine and indigenous healing traditions documented in Latin America.

**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 Napoleonic invasion of Portugal in 1808 led to the Crown's relocation and the creation of medical schools in Brazil.

(b) Brazil declared independence in 1822.

(c) Modern reforms were introduced about two decades later, in the 1840s.

**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 the quote mean by Flexnerian? Think back to our reading in The Scientific Attitude.** Flexnerian refers to reforms emphasizing laboratory-based medical education and standardization, as promoted in North America and adapted in Colombia by the mid-20th century.

**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) Urbanization and sanitation challenges were major drivers of epidemiology in 19th-century Brazil.

(b) The Tropicalist School aimed to study and combat tropical diseases like malaria.

(c) The bubonic plague entered Brazil in 1899, prompting quarantine measures and vaccination campaigns.