

December 6, 2024

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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?

There was a higher error rate in those papers where the authors had withheld their data. It also showed that 96 percent of the errors were actually in the scientist's favor.

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? - Groups are often better at finding errors because it allows for people to have different perspectives, error detection through discussion and even a possibility of reduction of bias because individuals are more prone to bias, and in a group, group members can check each other's biases.

(b) Can you give an example of the wisdom of crowds thus far in our study of Latin American science?

An example that I can think of is the example of Cinchona. It began with the indigenous knowledge, then later on there was European collaboration, through trial and error, collective refinement, and effective methods to extract and use quinine.

3. Recall the story of cold fusion. (a) List three facets of the peer review process that went wrong in this episode.

Three facets of the peer review process that went wrong is that they announced their findings at a press conference before actually going through the peer review process. The second one was also that their initial data report lacked sufficient detail about their experiment, methods and data which meant that scientist couldn't replicate the experiment to find more data.

(b) How long, from start to finish, did it take for the scientific community to sort out the errors in the cold fusion research?

From start to finish it took about 6-9 months in order to sort out the errors in cold fusion research.

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 skill in Rio de la Plata and Peru? (b) What is the primary profession of modern US leaders, for example, elected to The United States Congress?

Some examples that we talked about were cartographers, because it took skills that were vital for colonial administration and modernization. Another example would be mining experts, they were critical for the extraction and process of refining silver. The primary profession of modern US leaders is a legal profession, like lawyers.

5. Jose Mariano Mocino 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!)

Jose Mariano Mocino and many others traveled to Nootka Island in order to study the plants, animals, and cultures of the area while also helping Spain claim land during a dispute with Britain.

6. In Peru, we must take note of the work of Hipolito Unanue. (a) What are some of his other scientific contributions?

Some of his contributions were medical advancements, he is considered one of the founders of modern medicine in Peru. He also studied and documented the medicinal plants of Peru. He improved sanitation and public health, and contributed to the founding of the National university of San Marcos medical school in Lima

(b) In Nueva Granada, we must take note of the work of Jose Celestino Mutis. What are some of his main contributions?

He led the royal botanical expedition to explore and document the flora of Nueva Granada. His detailed botanical illustrations are still regarded as masterpieces.

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.

The Latin American wars of independence approximately began in 1808. An example of scientist and engineers would be Carlos de Sigüenza, Andrés Bello, and José de San Martín.

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Unit 4

1. How long after Semmelweis's solution to childbed fever was germ theory introduced?
The germ theory was introduced about 20 years after Semmelweis's discovery.

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 France, performing an autopsy fits within the scientific attitude because it involved observation, hypothesis testing and critical thinking.

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?

The discovery of penicillin was an accident while studying bacteria. It was an accident because the original experiment was not for penicillin. What Pasteur means by this was that some things are accidental but serendipity plays a role in it, and the scientific mindset and prior knowledge is what allows for discovery. The discovery of Cinchona could be considered both because of the initial discovery and then the scientific exploration that happened after it was discovered.

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

The Establecimiento de Ciencias de Medicas was created as a broad effort to modernize the country. The institution was established to improve medical education and public health. It became an important center for medical training and research.

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 Espana. (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?

They were slow to materialize because of lack of resources, they had fewer financial resources and had political instability as well. The person who led the medical reform process was Jose celestino Mutis. The facultad de medicina in nueva granada was reestablished in Bogota in 1802.

6. (a) How many medical schools were there in Brazil in the eighteenth century?
There were 3 in the eighteenth century.

(b) What happened to the Portuguese Crown in 1807? What influence did this have on medical reform?

The crown fled to Brazil, this had an important impact because it caused the creation of medical schools, and improved public health infrastructure.

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?

They established three key cultural institutions to enhance medical practice, Medical schools, hospitals and scientific societies/ journals.

8.

Triangulation

Suppose you observe a distant mountain from a flat plain.

Suppose you walk a baseline of 1km, 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?

The mountain is 22.9K kilometers 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?

55.6 kilometers apart

(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? 7.63

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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?

The first medicinal journals were published around the mid 19th century. The publications in Colombia were slightly behind the scientific journals in Mexico. Mexico had a greater emphasis on industrial and technological development during this period. They were tied to medical schools because many of the journals were edited and written by professors and students from institutions.

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 that involved this process were the *celegio de cirugia*, the *protomedicato* and the royal and pontifical university of Mexico.

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?

With the absence of modern germ theory kinesiology and nutrition science would not be considered modern in a traditional sense. Some other forms of medical development that we encountered were herbal medicine and dietary practices.

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?

The historical event happened when the Portuguese royal family fled to Brazil due to the Napoleonic invasion. Brazil declared independence from Portugal in 1822. Modern reforms in the medical schools of Bahia and Rio de Janeiro were introduced in the mid 19th century.

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.

Thinking back to our reading in the scientific attitude, this quote reflects a move towards scientific inquiry, evidence based practice, these were principles that were central to flexner’s vision for modernizing medical 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?

The major driver of modern epidemiology in the 19th century was the fight against infectious diseases, particularly yellow fever, smallpox, and malaria. These diseases along with the deadly bubonic plague led to an increase in attention for public health. The purpose of the Tropicalist School of medicine was to focus on tropical diseases and health issues that were unique to Brazil's environment and to adapt medical practice and research specific to tropical climates. The bubonic plague entered Brazil in 1900. The Brazilian government responded by calling upon public health experts like Oswaldo Cruz. Cruz created sanitary systems and the implementation of mass vaccination campaigns and the eradication of rats.