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CARS

Today's Info Session

- ▶ Welcome to this Info Session!
- ▶ Introduction
- ▶ What is CARS trying to test?
- ▶ Difficulty
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- ▶ Questions?

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MCAT
Medical College
Admission Test

WHAT IS YOUR NEXT STEP?

Introduction

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Hi, I'm Phil!

- ▶ **MCAT Content writer**
 - ▶ **Tutored and taught for 9+ years**
 - ▶ **Attended University of Nebraska Medical Center as an MD/PhD student.**
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Exam Overview

- ▶ **Four sections – three science, one verbal (CARS)**
- ▶ **Science sections all have same format/time constraints**
- ▶ **Passages and discrete questions alternate**
- ▶ **Some math required, but no calculator is provided**

Section	Time Allowed	Number of Questions	Question Format
Chemical and Physical Foundations	95 min	59	10 passages, 15 discretés
Critical Analysis and Reasoning Skills	90 min	53	9 passages
Biological and Biochemical Foundations	95 min	59	10 passages, 15 discretés
Psychological and Sociological Foundations	95 min	59	10 passages, 15 discretés

Passage difficulty

- ▶ The San Francisco Ballet (SFB), the oldest professional ballet troupe in the US, is lauded the world over for its masterful execution of ballet in the neoclassical “Balanchine aesthetic”.
- ▶ The German Empire existed for only 47 years and yet in that time did more to shape the nature of the 20th century than any other state in Europe (or possibly, the world).
- ▶ Olav Hammer’s scathing critique of anthroposophy centers primarily on his assertion that anthroposophy is not science, but scientism - the inappropriate application of the methods of empirical science to all areas of life and the assertion that the only true knowledge or facts that can be discovered are those revealed through typical scientific methods.

Indicators:

1. Vocab

2. Topic

3. Sentence structure

Passage 2

The usual story about the invention of paper gives credit to Cai Lun, an official of the imperial court in Han Dynasty China. Cai Lun's credit as the inventor of paper rests on claims that he was the first to significantly improve and standardize paper-making, turning it into a product that could be produced in massive quantities at low cost. Certainly paper-like substances long predate Cai Lun (and even both the Han and Qin dynasties), as Egyptians were writing on papyrus two to three thousand years before the Qin dynasty.

Cai Lun began his service as a court eunuch in 75 AD, and was promoted in 89 AD to the official in charge of the manufacture of instruments and weapons. After the death of his patron, Empress Dou, in 97 AD, Cai Lun is said to have set about working at a feverish pace to craft some invention that would win him the favor of the Emperor and return him to a position of influence in the court. It would seem that he achieved this in 105 AD upon completing his paper-making technique.

Passage 2

As historian Will Durant explains, Cai Lun perfected a recipe consisting of bark, hemp, silk, and even chunks of fishing net. The fibers were laid out in sheets and suspended in water. Removing the water, compressing the fibers, and allowing them to dry created a thin matted sheet of paper, which could then be cut into any desired size.

The relative simplicity of the craftsmanship in Cai Lun's method seems to speak against it requiring any special learning or great insight. Simple experimentation would have sufficed to produce the paper used throughout China in the centuries following Cai Lun's death. Historian Thomas Carter posits that one of Cai Lun's subordinates of a lower craftsman class is much more likely to have developed the technique for which Cai Lun takes credit or that Cai Lun simply re-discovered an older technique.

Passage 2

Carter's support for his revisionist view of the invention of paper rests on several observations. In 1986, an excavation at the Fangmatan site near Tianshui in the Gansu province uncovered a tomb including fragments of a paper map. Dating of artifacts surrounding the tomb led researchers to assume the paper map was from early 2nd century BC. The quality of the paper itself, as well as the ink used, show a craftsmanship very nearly similar to Cai Lun's method. Second, Carter discusses the huge number of journeyman and apprentices working under a highly ranked official like Cai Lun. With nearly a hundred journeymen, and double that number of apprentices, the odds that Cai Lun himself was the one to make a particular discovery seem slim.

Passage 2

Finally, Carter notices a remarkable dearth of other writings or innovations in Cai Lun's own personal notes or even in the hagiography that grew up around the man in later years (he became a subject of ancestor worship in the following centuries, with temples dedicated to his honor). A man with the mind of an experimenter must have hit on at least some other developments in the arts, or at least left behind records of failed attempts in his personal notes. Yet none such seem to exist.

On this final point, Carter may reach too far. After all, one may be struck by a single great insight, or have a single great stroke of luck but leave behind no other great inventions. Not all innovators need be an Edison or a Da Vinci. On the structure of Cai Lun's workshops, we routinely give credit to inventors and artists who have many working underneath them. The artist Andy Warhol even called his studio a "factory", so repetitive and machine-like was the production of works. Yet we don't worry about the authenticity of such a work being a "real" Warhol, since we recognize and give credit to the master's guiding hand and insight.

Passage 2

8. Based on the passage, the level of technical skill necessary to develop the paper-making techniques discussed was:

- A. low enough that the paper could have been invented by any number of craftsmen.
- B. so low that any uneducated peasant could have developed it.
- C. remarkably high, as is demonstrated by the fact that Chinese paper-making was a feat not duplicated elsewhere for a millennium.
- D. about the same as would have been needed to be accepted as a journeyman under Cai Lun's service.

9. Based on the passage, it is most likely true that Durant and Carter would disagree about which of the following?

- A. Whether there were an unusually large number of craftsmen working under Cai Lun
- B. Whether a work made by one of Andy Warhol's assistants in The Factory can properly be credited to Andy Warhol
- C. Whether Cai Lun was definitely the one to develop the recipe of bark, hemp, silk, and fishing net and the technique of compressing and drying it
- D. Whether the absence of any other great insights by Cai Lun proves that he must not have had the one insight into paper-making for which he is given credit

Passage 2

10. The author would most likely agree with which of the following?

- A. The presence of paper with similar qualities to Cai Lun's paper that predates Cai Lun's innovation by centuries speaks strongly to the fact that Cai Lun should not get sole credit for inventing paper.
- B. When examining the intellectual history of developments in a certain field, one can make strong inferences from the absence of information about a particular thinker.
- C. The usual story about the invention of paper is largely correct.
- D. The sophistication of Egyptian papyrus merits giving credit to the Egyptians for inventing paper, even if the structure and method for papyrus-making differs substantially from contemporary paper-making.

11. The passage implies that Carter would believe which of the following about a work conceived by and created by an apprentice working in Andy Warhol's Factory?

- A. Andy Warhol should be credited as the artist for that work.
- B. Andy Warhol should not be credited as the artist for that work.
- C. The artist who created the work should get to decide whether to take credit for the work or to let Warhol sign the work and claim it as his own.
- D. Credit should be shared among all working in a given workshop for any invention that comes out of the shop, since it is the collective work of everyone that allows the workshop to function.

Which of these would the author most agree with?

- A. The US had the strongest navy in the world at the time of world war 2
- B. Conflict can be beneficial
- C. If Germany would have adapted during battle X, they would have won the war
- D. World War 2 eventually increased sociological rights in Europe.

My car won't start this morning, and I was really wanting to go to the store to get some fois gras for dinner. My roommate, Voldemort, won't give me a ride. I guess I will eat ramen rather than fois gras for dinner.

Which of these is most likely true

- A. My car battery is dead.
- B. Voldemort is a jerk.
- C. I only have ramen at my house.
- D. I cannot walk to the store.

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Q&A

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Pause

Question 18

Which of the statements below is supported by the experimental results, as shown in Figures 1 and 2?

- A. The duration of Eos co-culture with NK cells directly and linearly correlates to the amount of ECP found in the supernatant after centrifugation.
- B. Cells cultured with a 1:1 NK-to-Eos ratio displayed statistically similar levels of activation to cells cultured with a 5:1 NK-to-Eos ratio, as measured by CD69 expression.
- C. NK co-culture stimulates Eos activation while inhibiting degranulation.
- D. Co-culture with NK cells significantly increased Eos degranulation in all groups, as compared to Eos cells cultured alone.

Figure 1 Eosinophil activation as measured by percent of CD69-positive cells after 3 and 12 hours of co-culture (*p < 0.05, **p < 0.01, ***p < 0.001)

Next, researchers aimed to assess the effect of NK co-culture on eosinophil degranulation. After 3 and 12 hours of co-culture, samples were centrifuged at 1500 rpm, and ECP levels were measured in the supernatants (Figure 2). No ECP was detected in supernatant culture of NK cells alone.

3 H 12 H

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Answers to questions

- ▶ 8 - A is correct. In the fourth paragraph we read that the craftsmanship was relatively simple and that Cai Lun's technique could have been found with simple experimentation. Later in the passage, we read that at least one historian thinks that it was one of the craftsmen working under Cai Lun that developed the technique.
- ▶ 9 - C is correct. The third paragraph tells us that, according to Durant, "Cai Lun perfected a recipe". Later in the passage we're told that Carter disputes that Cai Lun was the one who developed the recipe and technique for which he is given credit
- ▶ 10 - A is correct. In the final paragraph, the author seems to dispute two of the three points that Carter brings up. Since he doesn't dispute Carter's primary archeological evidence, we can infer that the author accepts Carter's basic theory - that Cai Lun should likely not get sole credit for inventing modern paper (after all, paper just like Cai Lun's was found that was hundreds of years older than Cai Lun).
- ▶ 11 - B is correct. Carter thinks that Cai Lun should not get credit as the sole inventor of paper, and one of his points is about how it is very likely that one of the craftsmen working under Cai Lun actually developed the new paper-making technique. Thus, generally, it seems that Carter thinks that the person who actually discovers or creates a thing should get credit for it, rather than credit being taken by the master of the workshop.