KYS Department of English

First Quarter Examination

G9 Reading Exam

The Case of the Missing Ancestor

DNA from a cave in Russia adds a mysterious new member to the human family.

A. In July 2008 in a cave called Denisova in the Altay Mountains of southern Siberia, Alexander Tsybankov was digging in deposits 30,000 to 50,000 years old. He found a tiny piece of bone which was identified as being from a primate fingertip. Since there is no evidence for primates other than humans in Siberia 30,000 to 50,000 years ago, the fossil was presumably from some kind of human. From further analysis, it was deduced that the human in question had died young, perhaps as young as eight years old.

B. Anatoly Derevianko, leader of the Altay excavations, thought the bone might belong to a member of our own species, Homo sapiens. Sophisticated artifacts that could only be the work of modern humans, including a beautiful bracelet of polished green stone, had previously been found in the same place. But DNA from a fossil found earlier nearby had proved to be Neanderthal – a kind of human that vanished more than 25,000 years before the Egyptian pharaohs, so it was possible that this bone was from a Neanderthal.

C. Derevianko sent a piece of the bone to Svante Pääbo, an evolutionary geneticist in Leipzig, Germany and it was there that events took a very unusual turn. Johannes Krause, a senior member of Pääbo's team, assumed that the bone was from an early modern human. He extracted the bone's DNA – discovering it had come from a little girl – and compared it with those of Neanderthals and living humans. The tiny chip of bone, was not from a modern human at all. But it wasn't from a Neanderthal either. It belonged to a new kind of human being, never before seen.

D. In 2010, a human toe bone was found, possibly from the little girl, too, but it turned out to be Neanderthal. The green stone bracelet had almost surely been made by modern humans. The toe bone was Neanderthal. And the finger bone was something else entirely. One cave, three kinds of human being. How had all three ended up there? How were Neanderthals and Denisovans related to each other and to the humans that inhabit the planet today?

E. Neanderthal DNA was completely different from that of any person now alive on Earth, suggesting that Neanderthals had been a separate species from us. However, Pääbo and his colleagues discovered that human DNA today actually contains a small but significant amount of Neanderthal code — on average about 2.5 percent. The Neanderthals may have died out 50,000 years ago, but not before leaving a little Neanderthal behind.

F. Denisovan DNA showed that they were more closely related to the Neanderthals than we were but the geographic pattern was odd. There was no trace of Denisovan DNA in Russia or nearby China, or anywhere else, except in the DNA of New Guineans, other people from islands in Melanesia, and Australian Aborigines. It was suggested that sometime before 500,000 years ago, probably in Africa, the common ancestor of Neanderthals and Denisovans moved away: the Neanderthals initially moving west into Europe and the

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Denisovans going east. Later still, when modern humans traveled out of Africa themselves, they interbred with the Neanderthals in the Middle East and Central Asia, probably between 67,000 and 46,000 years ago. One group of modern humans then continued east into Southeast Asia, where, sometime around 40,000 years ago, they encountered Denisovans. After interbreeding with them as well, they moved into Australasia, carrying Denisovan DNA.

G. But to date, no other Denisovan DNA has been found. And if the Denisovans were so widespread, why was there no trace of them in the DNA of any Asian people between Siberia and Melanesia and why had they left no mark in the archaeological record?

H. In 2012 Pääbo's group published a new version of the finger bone's DNA which was so precise that genetic information inherited from the little girl's mother could be discriminated from that of her father. One immediate revelation was how little variation there was between their DNA, but the pattern ruled out inbreeding. If the girl's parents had simply been closely related, they would have had huge chunks of exactly matched DNA. The pattern indicated instead that the Denisovan population had never been large enough to have developed much genetic diversity and had also suffered a drastic decline sometime before 125,000 years ago — the little girl in the cave may have been among the last of her kind.

I. Instructions: Write the letters of the paragraphs A-H next to each main idea from the reading The Case of the Missing Ancestor. Not all paragraphs may be used.

1. _____ There is more to our DNA than previously thought.
2. _____ An amazing discovery is revealed about the little finger bone.
3. _____ The Denisovian species did not survive long enough to develop significant genetic differences.
4. _____The bones in the cave held mysteries.
5. _____ The finger bone found in the cave could be either Homo sapien or Neanderthal.
6. _____ There is a theory as to how Denisoven DNA might have spread.
7. _____ A small human bone is discovered in Siberia.

The Urban Visionary

A. When architect and urban planner Richard Wurman learned that the majority of Earth's population lived in cities, he became curious. He wondered what the effects will be of global urbanization. With a group of business and media partners, Wurman set out on a five-year study — a project called 19.20.21 — to collect information about urbanization, focusing on the world's largest urban concentrations, or megacities.

B. The project's aim is to standardize the way information about cities — such as health, education, transportation, energy consumption, and arts and culture — is collected and shared. The hope is that urban planners will be able to use these objective data to enhance the quality of life for people in cities while reducing the environmental impact of urbanization.

Q. What draws people to cities?

C. Wurman: People flock to cities because of the possibilities for doing things that interest them. Those interests — and the economics that make them possible — are based on people living together. We really have turned into a world of cities. Cities cooperate with each other. Cities trade with each other. Cities are where you put museums, where you put universities, where you put the centers of government, the centers

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of corporations. The inventions, the discoveries, the music and art in our world all take place in these intense gatherings of individuals.

Q. Tell us about 19.20.21.

D. Wurman: For the first time in history, more people . . . live in cities than outside them. I thought I'd try to discover what this new phenomenon really means. I went to the Web, and I tried to find the appropriate books and lists that would give me information, data, maps, so I could understand. And I couldn't find what I was looking for. I couldn't find maps of cities to the same scale. Much of the statistical information is gathered independently by each city, and the questions they ask are often not the same . . . There's no readily available information on the speed of growth of cities. Diagrams on power, water distribution and quality, health care, and education aren't available, so a metropolis can't find out any information about itself relative to other cities and, therefore, can't judge the success or failure of programs . . .

E. So I decided to gather consistent information on 19 cities that will have more than 20 million people in the 21st century. That's what 19.20.21 is about. We'll have a varied group of young cities, old cities, third-world cities, second-world cities, first-world cities, fast-growing cities, slow-growing cities, coastal cities, inland cities, industrial cities, [and] cultural cities . . . so that cities around the world can see themselves relative to others.

Q. What are some of the cities you're looking at?

F. Wurman: What inspires me is being able to understand something, and understanding often comes from looking at extremes. So the cities that pop out are the ones that are clearly the largest, the oldest, the fastest growing, the lowest, the highest, the densest, the least dense, [or] the largest in area. The densest city is Mumbai. The fastest growing is Lagos. For years, the largest city was Mexico City, but Tokyo is now the biggest . . . There are cities that are basically spread out, like Los Angeles. Then there are classic cities, which you certainly wouldn't want to leave out, like Paris. I find the data on cities to be endlessly fascinating. Just look at the world's ten largest cities through time. The biggest city in the year 1000 was Córdoba, Spain. Beijing was the biggest city in 1500 and 1800, London in 1900, New York City in 1950, and today [it's] Tokyo.

Q. Cities are increasingly challenged to sustain their infrastructure and service. Can they survive as they are now?

G. Wurman: Nothing survives as it is now. All cities are cities for the moment, and our thoughts about how to make them better are thoughts at the moment. There was great passion 30 years ago for the urban bulldozer, that we had to tear down the slums, tear down the old parts of cities, and have urban renewal. That lasted for about 10, 15 years, until it didn't seem to work very well. And yet the reasons for doing it seemed justified at that moment . . . It shows that the attempt to make things better often makes things worse. We have to understand before we act. And although there are a lot of little ideas for making things better — better learning, increased safety, cleaner air — you can't solve the problem with a collection of little ideas. One has to understand them in context and in comparison to other places.

Q. You're an architect by training. Do you agree with the U.K.'s Prince Charles that architects have ruined the urban landscape?

H. Wurman: You can point to examples where architecture has ruined the urban landscape, and you can point to places where architecture has been the fundamental positive change. Look at the [High Line] park that runs [along the Hudson River] on the west side of Manhattan. That was done by architects and urban

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planners. Has it ruined New York? No. It's the beginning of knitting parts of the place together and the recognition that you're on the water, and it's a healthy thing.

I. But there is too much bling architecture — that's the showbiz part of architecture. Even though these individual buildings might be wonderful, they are not necessarily wonderful within the fabric of the city. Sometimes you can excuse them because they draw people from around the world to see them and, therefore, improve the health of the city. The classic example is Bilbao. Frank Gehry's [Guggenheim] museum in Bilbao draws millions of people and has changed this industrial Spanish city into a [center] for tourism. It's inspired other architects to improve the subway system and other buildings, and some of the wineries, and some of the hotels in and around the city. So that bling is certainly excusable.

J. But buildings that have nothing to do with the fabric of the city, that are brought about by the client's desire to have a signature building, those are not, in the long run, healthy because the fabric is what makes the city. Venice's Piazza San Marco was made by the fabric of all the buildings around that incredible square with just one cathedral at the end.

II. Instructions: Read the text - The Urban Visionary – and answer the questions.

8. What is another possible title for the reading?

a. The Appeal of a Big City

b. : 19.20.21: The Results

c. Understanding Megacities

9. When, in Wurman's opinion, is 'bling' architecture justified?

a. when the client achieves the aim of having a signature building

b. when the building helps to enhance the appeal of the city

c. when the building stands out and is very different from the others

10 What obstacle faced Wurman when he went online to search for information?

a. The type of information available wasn't consistent.

b. He couldn't find any maps of the cities he was interested in.

c. The information he did find wasn't in a statistical format.

11. What does the word 'that' (underlined) in paragraph H refer to?

a. The High Line park

b. Architecture that has ruined the urban landscape

c. The west side of Manhattan

12. Which kind of city is NOT likely to be studied by Wurman?

a. the richest city in the world

b. an old and historical city

c. an average city that is unknown to many people

13. What is the fundamental message in paragraph G?

a. Urban renewal isn't the right approach.

b. Little ideas are the ones to focus on

c. Ideas about how to improve cities are correct only in the context of time

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III. Instructions: Complete the following sentences with the correct word.

14. We are looking for interested parties wanting to _____ in our urbanization program.

a. invest

b. exceed

c. focus

15. In the next _____ we are going to see huge changes in the way people live in cities.

a. institute

b. decade

c. aspect

16. The city lacks basic _____ such as roads and a proper sewage system.

a. aspect

b. institute

c. infrastructure

17. The school requires more funding to _____ it to renovate its classrooms.

a. enable

b. exceed

c. invest

18. With so many people still driving old cars, a high level of air pollution is _____.

a. enabled

b. inevitable

c. exceeded

19. Residents of the neighborhood felt that the committee was _____ on the wrong issues and not dealing with the big problems.

a. investing

b. exceeding

c. focusing

20. The school board were concerned that they had already _____ the budget for the year and were eating into next year's funds.

a. exceeded

b. enabled

c. focused

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