（平成 25 年度前期日程）

外　国　語

（英　語）

90　分

注　意　事　項

1. 試験開始の合図までこの冊子を開かないこと。
2. 本問題冊子は 13 ページ，答案用紙は 2 ページである。
3. 各答案用紙の上の枠内には，**受験番号**を記入し，その右側の枠内には，受験番号の**下 2 桁**の数字を忘れずに記入すること。
4. 解答はすべて各答案用紙の所定の欄に記入すること。
5. 答案用紙の冊子は切りはなさないこと。
6. 答案用紙に記入する受験番号の数字の字体は，下記の例にならい，明瞭に記入すること。

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試験問題は，つぎのページより始まります。

I　次の英文を読んで、以下の設問に答えよ。(80点)

In the Cardamom Mountains of southwest Cambodia, the rain forest grows thick. During monsoon season, a canopy of phayom, rosewood, pinang baik, and white meranti trees blocks out the sun. At night, the forest emits its own soft orange light, as hunters burn campfires to ward off elephants.

"It's seriously rough country, a wild and beautiful place," says Brendan M. Buckley, a Columbia scientist who led a research expedition here in January. "You move slowly, bashing and slashing your way through the vegetation."

Buckley is here because he thinks these woods, which are among the most remote in Asia, hold secrets to the disappearance of a city that once existed in the jungle some 100 miles north of the mountains. This was the city of Angkor[*1], which, at its pinnacle in the 12th century, was home to 750,000 people and covered some 400 square miles — the largest footprint of any urban development in the preindustrialized world. Its workers built gigantic Hindu temples out of sandstone and planted rice paddies that stretched far over the horizon. Its engineers created dams and reservoirs to irrigate crops, even waterways to travel around the settlement by boat.

And then this civilization vanished. 16世紀にポルトガルの宣教師たち(Portuguese missionaries)が到着した頃までには[(1)]、その都市はおおかた打ち棄てられ、寺院は草木に埋もれてしまっていた。

What happened to Angkor? "There are few written accounts that have survived from the period, so it's an enduring mystery," says Victor Lieberman, a professor of Southeast Asian history at the University of Michigan. "We historians don't have much evidence to grasp onto."

But that's changing now that Buckley is discovering new clues — not in stone carvings or long-lost travelogues, but in the flesh of evergreen trees.

Climbing up a ridge in the Cardamoms, Buckley spots a cluster of evergreens known as *Dacrycarpus imbricatus*, a rare species with no common name in

English. With their needle-shaped leaves and shrubby limbs, the trees look out of place in a rain forest.

"Even in the tropics, we find evergreens in the highest, coolest altitudes," says Buckley, an associate research professor at Columbia's Tree-Ring Laboratory. "We look for evergreens because they show their growth rings clearly. They're prized for their soft lumber, too, so we have to go into remote areas to find any old ones still standing. These here are really nice — maybe 500 years old."

Buckley unzips his knapsack and removes a wood borer*2, a hand-operated drill with an extremely long, hollow bit. He presses the borer gently into the side of a tree, aiming it straight for the core. Then, gripping the borer's T-shaped handle with both hands, Buckley leans into the tree and begins rotating the tool as if it were a tire iron. With each half-turn, the scientist lets out a grunt and the wood produces a nasal, birdlike squawk. The oily, slightly floral scent of conifer wafts in the air. After 15 minutes, Buckley stops, the borer having disappeared almost entirely into the tree. He inserts a tiny spoon into the back of the tool's hollow bit and pulls out a long beige dowel partitioned by some 450 orange stripes — a chronicle of this tree's life.

"These rings hold a lot of secrets," he says. "Not just the tree's age, but also its annual growing conditions. In a year when there's little rain, you'll get a skinny ring."

Since the mid-1990s, Buckley has collected cores*3 from thousands of trees across Cambodia, Vietnam, Thailand, and Laos, generating insights into the region's climate history that could have been achieved no other way: Just as ice cores provide a glimpse of past atmospheric conditions and coral reefs indicate historic ocean temperatures, tree rings document annual (①).

And it doesn't hurt the tree. After Buckley takes a core, he doesn't even need to plug up the hole. "It's actually better for the tree if you don't plug it," he says. "Trees are very good at compartmentalizing their wounds, which means

they physically and chemically wall off the injured area to prevent pathogens from seeping in."

Over the course of this three-day field expedition, Buckley will collect dozens of cores, slide each one into a clear plastic tube that resembles an oversized drinking straw, and ship them to his lab at the Lamont-Doherty Earth Observatory, in Palisades, New York. (2) Once he's back at the lab, he will sandpaper each core until it's shiny smooth, which enables him to take microscopic measurements of its rings. Then, by analyzing the rings from many trees of the same species — looking for years in which all of the trees grew a skinny ring or a wide ring, for instance — he will identify common patterns in their year-to-year growth variations. With this information, he can estimate past rainfall levels.

"Weather stations started taking routine measurements of rainfall in this area in 1951," Buckley says. "So we start by correlating the newest tree rings against these precise rainfall measurements. Then, we can extrapolate backward into the distant past, based simply on the rings."

Buckley didn't start this work with Angkor in mind. As a climate scientist, he has always had a broader goal: to help fellow scientists design computer models that can predict future rainfall patterns in Asia, based on past monsoon cycles. He has already made important contributions in this area, showing, for instance, that when water temperatures in the Pacific and Indian Oceans have changed over the past millennium, monsoons have typically been disrupted, triggering wild variations in the amount of rainfall they bring.

A few years ago, however, Buckley, who is widely regarded as the foremost tree-ring researcher working in the Asian tropics, started receiving phone calls from (②). Word had spread that he was routinely coring trees as old as 750 years, dating back to Angkor's heyday. Soon, Buckley was collaborating with archaeologist Roland Fletcher, a professor at the University of Sydney and an expert on Angkor's medieval civilization. Buckley began looking for old-growth

forest as near as possible to Angkor and helping his colleague interpret the data.

Their big discovery came last spring, when Buckley, Fletcher, and fellow Columbia tree-ring specialists Edward Cook and Kevin Anchukaitis published a paper showing that Angkor, during the century before it is thought to have collapsed, experienced two long and severe droughts. The first lasted an astonishing 30 years, the next 20 years. Each of these dry periods was punctuated by several years of heavy monsoons that, according to Buckley, likely caused devastating floods.

"We're talking about dry spells the likes of which we've never seen in modern history," he says. "And then, the skies open up and the rain won't stop."

That discovery, published in the *Proceedings of the National Academy of Sciences*,(3) has provided the most compelling evidence yet for a theory that most scholars, until now, have dismissed as overly speculative: that climate change contributed to Angkor's collapse. Other, more subtle clues had been found before. A few years ago, Fletcher and his team of archaeologists unearthed evidence that Angkor's main reservoir was renovated around the same time the city is thought to have collapsed, in the early 15th century, to be just half of its original size. The archaeologists hypothesized that this renovation was undertaken during a prolonged drought to ensure that water coming into the reservoir from a nearby river would accumulate rather than seep into a big, half-empty mud basin.

"There are also accounts of drought in China and in India around this same time," says Lieberman, the historian at Michigan. "アンコールも極端な気候に見舞われたかもしれないと考えるのは，理にかなっているだろう。"(4) This was a period when the Earth was undergoing a major climate shift, scientists believe, as it was transitioning from what's commonly called the Medieval Warm Period into the Little Ice Age.

Few historians have considered climate change's effects on Angkor, however. The standard explanation for Angkor's demise, Lieberman says, is that

its ruling elite simply abandoned the city when economic activity in Southeast Asia shifted southward toward coastal ports in the 14th century. Other scholars say that Angkor's political structure disintegrated when Buddhism swept through the region in the 13th century, as Angkor's rulers considered themselves earthly representations of Hindu gods.

(5) Lieberman stands alone among prominent historians in that he has suggested for years that climate change hastened Angkor's collapse. "The evidence that Angkor saw severe drought was rather circumstantial before Brendan generated this rainfall data, but I still thought it was the best prima facie*4 explanation we had," he says. "Other historians haven't looked at this issue closely, I think, in part because they don't feel comfortable with their own understanding of the science. So, in the absence of any written accounts of drought or flooding near Angkor, they've preferred to focus on the types of phenomena they're accustomed to writing about, which are the economic, political, and cultural factors."

Now, with Buckley's findings, Lieberman believes that historians are obligated to study how Angkor, as well as several other historic Southeast Asian civilizations, were affected by extreme weather. He points out that Buckley's data reveal prolonged droughts also occurred between 1638 and 1641, just three years before peasant rebellions led to the fall of the Ming Dynasty*5, and between 1756 and 1768, around the same time that three kingdoms in what are now Vietnam, Myanmar, and Thailand all collapsed. In a forthcoming essay coauthored with Buckley, Lieberman exhorts fellow historians to examine why certain civilizations succumbed to these droughts while (③). The answers might lie, they say, in the societies' water-management strategies, the nature of their governments, and the diversification of their economies.

"For the first time," Lieberman and Buckley write, "we have the data to make climate change a part of our regional narrative."

*1 Angkor　アンコール(カンボジアの古代クメール王朝の首都。現在ではアンコールワットを含む遺跡群となっている)

*2 borer　穴をあける道具

*3 cores　(ドリル等で採った)円筒形標本

*4 prima facie　一見したところでの

*5 the Ming Dynasty　(中国の)明朝

[Adapted from David J. Craig, "What Happened to Angkor?" *Columbia Magazine* (Spring 2011), 22–27.]

I –1. 下線部(1)を英語に訳せ。

I –2. 下線部(2)を日本語に訳せ。

I –3. 本文によれば，下線部(3)冒頭の "That discovery" のほかにも，この理論を裏付ける証拠が少し前に見つかっている。その証拠とは何か，日本語で説明せよ。

I –4. 下線部(4)を英語に訳せ。

I –5. 下線部(5)を日本語に訳せ。

I－6. 本文中の空欄①, ②, ③に入れるのにもっとも適切なものをAからEの中から選び, 記号で答えよ。

空欄①

Just as ice cores provide a glimpse of past atmospheric conditions and coral reefs indicate historic ocean temperatures, tree rings document annual (①).

A. bird populations
B. CO_2 emissions
C. insect damage
D. rainfall levels
E. rituals of local people

空欄②

A few years ago, however, Buckley, who is widely regarded as the foremost tree-ring researcher working in the Asian tropics, started receiving phone calls from (②).

A. biologists and physicists
B. historians and archaeologists
C. medical and drug researchers
D. weather forecasters and reporters
E. wildlife and nature conservationists

空欄③

In a forthcoming essay coauthored with Buckley, Lieberman exhorts fellow historians to examine why certain civilizations succumbed to these droughts while (③).

A. others declined
B. others ignored them
C. others recorded them
D. others survived
E. others vanished

I-7. 下の1から10の文から、本文の内容に一致するものを3つ選び、番号で答えよ。

1. Angkor grew to a population of 750,000 and was distinguished by its waterworks, enormous wooden temples and vast expanses of surrounding rice fields.
2. There are so many conflicting accounts from the period when Angkor was abandoned that scholars don't know which are the most reliable.
3. None of the evergreen trees in the Cardamom Mountains are old enough to yield data useful for solving the mystery of the collapse of premodern cities and kingdoms in Southeast Asia.
4. Coring doesn't have a damaging effect on trees, because they rarely compartmentalize wounds before regenerating the wood in a damaged area.
5. Brendan Buckley's earlier research in climate science contributed to knowledge of how change in ocean temperatures has affected quantities of rainfall.
6. The people of Angkor experienced periods of drought for about three-quarters of the century before the city's collapse.
7. There was a period of acute change in climate during the early 15th century, and this was framed by shorter periods of instability when global conditions transitioned from cold to warm.
8. Some scholars think the weakening of Hinduism in Southeast Asia was an important factor in the disintegration of Angkor society.
9. Most historians have not been willing to take into account the effects of climate change, and have focused their attention on other factors such as culture and politics.
10. Peasant rebellions led to the end of the Ming Dynasty, and subsequently several kingdoms in Southeast Asia.

Ⅱ　次の英文を読んで，以下の設問に答えよ。(70 点)

From the language point of view, the present population of the world is not six billion, but something over six thousand.

There are between six and seven thousand communities in the world today identified by the first language that they speak. They are not of equal weight. They range in size from Mandarin Chinese with some 900 million speakers, alone accounting for one sixth of all the people in the world, followed by English and Spanish with approximately 300 million apiece, to a long tail of tiny communities: over half the languages in the world, for example, have fewer than five thousand speakers, and over a thousand languages have under a dozen. This is a parlous time for languages.

In considering human history, the language community is a very natural unit. Languages, by their nature as means of communication, divide humanity into groups: only through a common language can a group of people act in concert, and therefore have a common history. Moreover, (1)ある集団が共有している言語は，まさに彼らの共同の歴史の記憶が共有される媒体である. Languages make possible both the living of a common history, and also the telling of it.

And every language possesses another feature, which makes it the readiest medium for preserving a group's history. Every language is learnt by the young from the old, so that every living language is the embodiment of a tradition. That tradition is in principle immortal. Languages change, as they pass from the lips of one generation to the next, but (2)there is nothing about this process of transmission which makes for decay or extinction. Like life itself, each new generation can receive the gift of its language afresh. And so it is that languages, unlike any of the people who speak them, need never grow infirm, or die.

Every language has a chance of immortality, but this is not to say that it will survive for ever. Genes too, and the species they encode, are immortal; but

extinctions are a commonplace of palaeontology[*1]. Likewise, the actual lifespans of language communities vary enormously. The annals of language history are full of languages that have died out, traditions that have come to an end, leaving no speakers at all.

The language point of view on history can be contrasted with the genetic approach to human history, which is currently revolutionising our view of our distant past. Like membership in a biological species and a matrilineal lineage, membership in a language community is based on a clear relation. (3) An individual is a member of a species if it can have offspring with other members of the species, and of a matrilineal lineage if its mother is in that lineage. Likewise, at the most basic level, you are a member of a language community if you can use its language.

The advantage of this linguistically defined unit is that it necessarily defines a community that is important to us as human beings. The species unit is interesting, in defining our prehistoric relations with related groups such as *Homo erectus* and the Neanderthals, but after the rise of *Homo sapiens* its usefulness yields to the evident fact that, species-wise, we are all in this together. The lineage unit too has its points, clearly marked down the ages as it is by mitochondrial DNA and Y-chromosomes[*2], and can yield interesting evidence on the origin of populations if some lineage clearly present today in the population is missing in one of the candidate groups put forward as ancestors. So it has been inferred that Polynesians could not have come from South America, that most of the European population have parentage away from the Near Eastern sources of agriculture, and that the ancestry of most of the population of the English Midlands is from Friesland. But knowing that many people's mothers, or fathers, are unaccounted for does not put a bound on a group as a whole in the way that language does.

Contrast a unit such as a race, whose boundaries are defined by nothing more than a chosen set of properties, whether as in the nineteenth and early

twentieth centuries by superficial resemblances such as skin colour or skull proportions, or more recently by blood and tissue groups and sequences of DNA. Likewise, there are insurmountable problems in defining its cultural analogue, the nation, which entail the further imponderables of a consciousness of shared history, and perhaps shared language too. Given that so many of the properties get shuffled on to different individuals in different generations, it remains doubtful as to what to make of any set of characteristics for a race or a nation. But use of a given language is an undeniable functioning reality everywhere; above all, it is characteristic of every human group known, and persistent over generations.(4) It provides a universal key for dividing human history into meaningful groups.

Admittedly, a language community is a more diffuse unit than a species or a lineage: a language changes much faster than a DNA sequence, and one cannot even be sure that it will always be transmitted from one generation to the next. Some children grow up speaking a language other than their parents'. 言語共同体は，数えたり，しっかりと区別したりするのが必ずしも容易でない。(5) But they are undeniably real features of the human condition.

*1 palaeontology: the study of past life forms as represented in fossils

*2 chromosome: a tiny part of the body that carries genes

[Adapted from Nicholas Ostler, *Empires of the Word: A Language History of the World*, London: Harper Perennial, 2005, pp.9-10.]

Ⅱ-1. 下線部(1)を英語に訳せ。

Ⅱ-2. 下線部(2)を日本語に訳せ。

Ⅱ-3. 下線部(3)の関係が clear と言えるのはなぜか。日本語で説明せよ。

Ⅱ-4. 下線部(4)を，文中の it の内容を明らかにして日本語に訳せ。

Ⅱ-5. 下線部(5)を英語に訳せ。

Ⅱ-6. Choose the correct answer for each question below.

(1) What is an implied purpose of the text?

A. to define the features of a language community

B. to describe how new languages emerge

C. to explain why some languages have more speakers than others

D. to record the cultural history of people whose language is disappearing

E. to show how the migration of people speeds the evolution of a language

(2) Which group of people would most likely be interested in the text?

A. people who are interested in artifacts from ancient peoples and societies

B. people who are interested in researching their own family lineage

C. people who are interested in statistics related to population studies

D. people who are interested in the history of group consciousness

E. people who are interested in the geography of human expansion

Ⅱ-7. 下の1から8の文から，本文の内容に一致するものを2つ選び，番号で答えよ。

1. Quite a few languages are spoken by fewer than twelve people.
2. A language may be considered immortal if it has a writing system.
3. Mothers influence children's language development more than fathers do.
4. The species unit, the lineage unit, and the linguistic unit are crucial concepts in the study of languages.
5. Neanderthals, *Homo erectus*, and *Homo sapiens* used similar languages.
6. Mapping the human genome is a significant project for historians of language.
7. Rapid genetic mutations make it hard to trace a group's biological history accurately.
8. A child can belong to a different language community from that of her or his parents.