

Academic Reading Paper 45

Letters, Ice Ages and Rules

Time allowed: 1 hour

INSTRUCTIONS TO CANDIDATES

- Do not open this booklet until you are told to do so.
- Write your name and the date at the top of the answer sheet.
- Answer **all** the questions.
- Write your answers **on the answer sheet**, not in this booklet.
- You must transfer your answers within the hour. **No extra time is given for transferring answers in the Reading test.**
- Do not remove this booklet from the examination room.

INFORMATION FOR CANDIDATES

- There are 40 questions in this paper.
- Each question carries one mark.
- There are three passages, with 13, 13 and 14 questions.

These passages were written for this library. They are **not** reproduced from any published past paper. The format, timing and task types follow the published specification for the Academic Reading test so that sitting this on paper feels like the real thing.

You should spend about 20 minutes on **Questions 1–13**, which are based on Reading Passage 1 below.

The price of a letter

Before 1840 the person who paid for a letter in Britain was the person who received it, and the amount depended on how far it had travelled and how many sheets of paper it contained. A single sheet from London to Edinburgh cost more than a labourer earned in a day. Because payment fell due on delivery, a recipient who did not want the letter could refuse it, and many did, which meant the Post Office had carried it four hundred miles for nothing. Correspondents developed elaborate ways round the system, including codes written on the outside of the cover that could be read and understood without the letter being accepted at all.

The expense was not mostly in the carrying. Every item had to be assessed individually: the route measured, the distance priced, the sheets counted, the charge written on the cover and then collected in coin at the door. Clerks did this arithmetic at each stage of a journey, and a large part of the department's staff existed to perform it. On top of this sat the franking privilege, under which members of Parliament could send letters free, a right that was lent to friends, sold, and used on a scale that nobody could measure because the whole point of a franked letter was that it was never counted against anything.

In 1837 a schoolmaster and administrator with no experience of the postal service published a pamphlet about it. Rowland Hill's central claim was arithmetical and, at the time, absurd. He estimated the cost of actually conveying a letter from London to Edinburgh at a minute fraction of a penny, and argued that essentially the entire expense of the service lay in assessing, recording and collecting the charge. If that were true, then the pricing system was not paying for the service. It was the service. Reduce the accounting to nothing and the price could fall to almost nothing with it.

His proposal followed from the arithmetic and had four parts. Payment would be made by the sender rather than the recipient. The charge would be the same regardless of distance. It would be set at one penny for a letter of half an ounce, a weight chosen because it covered the ordinary letter that most people would want to send. And there would have to be some way of showing at a glance that payment had been made, for which an adhesive label was one of several suggestions in circulation and not originally his own.

The Post Office opposed him. Its senior officials predicted that the revenue would collapse and the department be ruined, and in the short term they were right. Parliament passed the measure anyway. Uniform penny postage began in January 1840 and the first adhesive stamp was issued in May. The number of letters carried in the last year of the old system was about 76 million. In the first year of the new one it was 169 million. By 1850 it was 347 million, and by then a working family could write to a son who had gone to another town.

The financial account should be given honestly, because it is usually left out. Revenue fell sharply and did not regain its 1839 level for something close to thirty years. Measured by the test the Treasury actually applied, the reform was a failure for a generation. What it produced in exchange was a volume of correspondence that had not previously existed, from people who had never been able to write to anybody, and no forecast made in 1839 could have contained it because there was nothing to forecast it from.

Two complications are worth adding to the story as it is usually told. The railway network was built across the same decades, and a great deal of what made cheap national distribution possible was track rather than policy, though the credit has attached to the policy. And Hill's insight was not wholly new; parts of the argument had been made before him by others whose names are not on the stamps. He was also, by most accounts, a difficult man whose later running of the department was disputed by people who had to work with him.

What has survived is the principle rather than the reformer. Where the cost of providing a service is mostly fixed and administrative, charging in proportion to use can cost more to collect than it brings in, and a flat charge may raise more money while looking like a giveaway. That argument is now made about road pricing, about bank charges and about payments of a few pence on the internet. It was first set out in detail about the cost of sending one sheet of paper to Edinburgh.

Questions 1–5

Complete the notes below.

Choose **NO MORE THAN TWO WORDS AND/OR A NUMBER** from the passage for each answer.

Before and after 1840

The old system

- The charge depended on the distance travelled and on the number of **1** in the letter.
- Members of Parliament could send letters free under the **2** privilege.

What Hill proposed in 1837

- One penny would carry a letter weighing up to half an **3**
- Payment would fall on the **4** rather than on the person receiving the letter.

Volumes carried

- Letters rose from about 76 million in 1839 to **5** million in 1850.

Questions 6–9

Choose the correct letter, A, B, C or D.

- 6** How did some correspondents avoid paying at all?
- A by writing a code on the outside of the cover
 - B by paying in advance at a counter
 - C by using fewer sheets of paper
 - D by collecting their letters from the Post Office
- 7** What was Rowland Hill's central claim?
- A that the Post Office employed too many clerks
 - B that nearly the whole cost lay in assessing and collecting the charge
 - C that letters ought to be carried by rail
 - D that pricing by distance was unfair to the poor
- 8** How does the passage describe the financial outcome?
- A Revenue rose from the first year.
 - B Revenue took about thirty years to reach its earlier level.
 - C Revenue never recovered.
 - D The Treasury made no attempt to measure it.
- 9** What does the passage say about the adhesive label?
- A Hill invented it himself.
 - B It was one of several suggestions already in circulation.
 - C It was introduced before prepayment began.
 - D Parliament objected to it.

Questions 10–13

Do the following statements agree with the information given in Reading Passage 1?

Write **TRUE** if the statement agrees with the information, **FALSE** if the statement contradicts the information, or **NOT GIVEN** if there is no information on this.

- 10** The Post Office's own senior staff argued against the change.
- 11** The writer says the policy mattered more than the railways in making cheap distribution possible.
- 12** Other countries introduced a flat postal rate soon after Britain did.
- 13** Colleagues found Hill difficult to work with.

You should spend about 20 minutes on **Questions 14–26**, which are based on Reading Passage 2 below.

The clock in the orbit

- A** That there had been ice ages was established in the nineteenth century and accepted with some reluctance. Boulders sat in valleys that no river could have moved them along, and rock surfaces across northern Europe were scratched in parallel lines pointing the same way. What nobody could supply was a mechanism. Whatever had done this was evidently repeating, since the evidence showed more than one advance, and it had to act on a planetary scale rather than on one continent. A cause confined to Europe could not explain what the same rocks showed in North America.
- B** The first serious attempt came from a man with no position in science. James Croll worked as a janitor at a college in Glasgow and read in the library he was employed to look after. In the eighteen-sixties and seventies he argued that slow changes in the shape of the Earth's orbit would alter the amount of sunlight reaching high latitudes, and that this could be enough to start and end a glaciation. The mechanism was sound in outline, and he published it in the leading journals of the day, which had no objection to the author's employment. His predictions about when the cold periods should have fallen were wrong, and when they failed to match the evidence the whole approach fell out of favour with it.
- C** Milutin Milanković took it up in the nineteen-twenties and did the calculation properly. Three separate motions matter. The orbit stretches from more circular to more elliptical and back over roughly a hundred thousand years; the tilt of the axis varies over about forty-one thousand; and the axis wobbles, moving the seasons around the orbit, over about twenty-three thousand. Milanković worked out how much summer sunlight reached sixty-five degrees north for each of the previous six hundred thousand years, by hand, over decades of work. His claim was precise and testable: ice sheets grow not when winters are colder but when northern summers are too cool to melt the snow the winter has left.
- D** It was rejected for thirty years, and the reason was not prejudice. Testing a curve requires a record with dates on it, and the evidence available was scratched rock and heaps of gravel on land, which is fragmentary by nature because each glaciation destroys much of what the last one left. The ages that could be assigned were poor and appeared in places to disagree with the calculation. By the nineteen-fifties the theory was treated as a historical curiosity rather than as an open question, and it was left out of the textbooks that were teaching the next generation what the problems in the subject were.
- E** What eventually tested it came from an entirely different line of work. Cesare Emiliani, in the nineteen-fifties, began measuring the ratio of two oxygen isotopes in the shells of microscopic marine organisms recovered from cores drilled into the sea floor. The ratio in a shell depends on the tem-

perature of the water and on how much of the world's water is held in ice at the time. A core taken from the deep ocean is therefore a continuous record, laid down without interruption, where the evidence on land is a set of scattered fragments with the connections missing.

F In 1976 James Hays, John Imbrie and Nicholas Shackleton took two long cores from the southern Indian Ocean, in a part of the sea floor where sediment accumulates steadily and undisturbed, and looked for regular periods in the isotope record. They found three, at approximately a hundred thousand, forty-one thousand and twenty-three thousand years. These are the three numbers Milanković had computed from the geometry of the orbit, and they had been sitting in print, unusable, for the whole of the intervening period. The paper announced the result in its title. The theory was half a century old and its author had been dead for eighteen years.

G The caution that belongs with this is not a small one and it is still unresolved. The strongest signal in the record is the hundred-thousand-year cycle, and of the three that is by far the weakest as a cause: the change it makes to the sunlight arriving at high latitudes is very slight, far too slight on its own to build and remove an ice sheet. So the record is dominated by the one cycle that has least power to produce it. Something in the behaviour of the ice sheets themselves, or in the carbon dioxide that moves in and out of the ocean, must be amplifying a small push into a large response, and after fifty years of work there is no agreed account of how. The orbit has turned out to be an excellent clock and a poor engine.

Questions 14–17

Look at the following achievements and the list of people below.

Match each achievement with the correct person or team, A–D.

List of People	
A	James Croll
B	Milutin Milanković
C	Cesare Emiliani
D	Hays, Imbrie and Shackleton

- 14 read in a library that he was employed to look after
- 15 worked out six hundred thousand years of summer sunlight without a machine
- 16 measured two isotopes in the shells of very small sea creatures
- 17 found three regular periods in a pair of ocean cores

Questions 18–22

Complete the summary using the list of words, A–H, below.

List of Words

- A shape
- B summers
- C fragmentary
- D continuous
- E cause
- F winters
- G tilt
- H clock

Three motions and one unsolved problem

Milanković set out three motions: the **18** of the orbit, over about a hundred thousand years; the tilt of the axis, over about forty-one thousand; and a wobble that moves the seasons, over about twenty-three thousand. His claim was that ice sheets grow when northern **19** are too cool to melt the snow left by winter. The theory was set aside because the evidence on land was **20** and poorly dated. Confirmation came in 1976 from ocean cores, which supply a **21** record. What remains unexplained is that the strongest signal in the record comes from the weakest **22**

Questions 23–26

Complete each sentence with the correct ending, A–G, below.

List of Endings

- A each glaciation destroys much of what the one before it left.
- B a good clock but a poor engine.
- C how much of the world's water is held as ice at the time.
- D the dates he predicted did not fit the evidence.
- E the journals of the day would not print his work.
- F the depth of water in which the shell formed.
- G both an accurate clock and a sufficient cause.

- 23 Croll's version lost its support because
- 24 Evidence on land is incomplete because
- 25 The isotope ratio in a shell depends on the water temperature and on
- 26 The writer's closing judgement is that the orbit has turned out to be

You should spend about 20 minutes on **Questions 27–40**, which are based on Reading Passage 3 below.

Why the rules keep growing

Every rule was put there for a reason. Somebody was injured, or money was lost, or a thing that should not have happened happened, and a rule went in to prevent a repetition. This is the whole explanation for why rule-books grow and hardly ever shrink. Adding a rule is a visible response to a failure everybody has just seen. Removing one is a bet against a failure that has not occurred yet, placed by a person who will be named if it does.

The asymmetry is in who owns the consequence. Somebody who introduces a requirement after an incident is credited with having acted. Somebody who takes a requirement out owns the next incident personally, whether or not the removal had anything to do with it, and the connection will be made regardless because it is the most available explanation in the room. Nobody has ever been promoted for deleting a paragraph. The incentive does not merely favour addition; it makes subtraction something that a sensible person declines to be associated with.

So a rule-book accumulates at roughly the rate at which the organisation has incidents, and accumulation has a threshold in it. Below the threshold more rules do mean more safety, and the people who say so are right. Above it the set can no longer be held in one head, or carried out in the time the work actually allows, and at that point something has to give, because the alternative is that the work stops, and organisations do not permit the work to stop.

What gives is uniform compliance. People begin choosing which rules to follow. They do this with judgement they were never trained to apply for that purpose, on the basis of what has caused trouble before rather than what is most dangerous now, and they cannot defend the choice afterwards because the official position is that no choosing occurs. The selection is invisible until something goes wrong, and it is then described as an individual's failure to follow procedure rather than as the predictable output of a set that cannot be followed entire.

The clearest illustration is not a scandal but a routine hospital ward. A single patient in intensive care can generate several hundred alarms in a day, and the overwhelming majority of them require nothing to be done. Each type of alarm was introduced by somebody guarding sensibly against a particular harm, and each, considered alone, is justified. Taken together they produce a room in which alarms are the background against which work happens, and the one alarm that matters is the one nobody turns to. No individual decision in that sequence was unreasonable, which is what makes the outcome difficult to argue anybody out of.

The opposite position has to be given its full weight, because it is usually right about the people making it. Fewer rules is a slogan, and the argument for it is very often advanced by those the rules exist to restrain. The reasons behind an individual rule are frequently invisible to somebody proposing to remove it, since the incident that produced it may be twenty years old and undocumented. And the phrase com-

mon sense, deployed in this context, almost always means the speaker's own habits, which is exactly the thing rules were invented to override. An organisation cannot run on the accumulated instincts of whoever happens to be in the room.

Both positions are answering a question that is not the interesting one. The argument is not about how many rules there should be. It is about whether a rule is ever required to justify itself a second time. A rule written in the days after an incident is composed under the worst possible conditions: maximum urgency, maximum embarrassment, minimum information about what actually went wrong. It is then filed, and it will govern the organisation for thirty years without anybody ever reading it again under calmer conditions than the ones that produced it. The rule outlives the machine it was written for, the process it constrained, and everybody who remembers why it exists.

The proposal is dull and that is a recommendation. At the moment a rule is created, give it a named owner and a date for review. Not an automatic expiry, which is only another way of removing rules without anybody owning the removal, but a scheduled occasion on which a person has to state, in writing and on the record, that the rule is still needed and why. That turns deletion from an act of individual courage into a piece of ordinary administration. It is the only form in which it will ever actually happen, and it costs the organisation an hour a year.

Questions 27–32

Do the following statements agree with the claims of the writer in Reading Passage 3?

Write **YES** if the statement agrees with the claims of the writer, **NO** if the statement contradicts the claims of the writer, or **NOT GIVEN** if it is impossible to say what the writer thinks about this.

- 27 The writer thinks organisations should set out to have fewer rules.
- 28 The writer accepts that up to a point more rules do make things safer.
- 29 The writer believes hospitals handle rules worse than other organisations do.
- 30 The writer regards selective compliance as mainly a failure of individual discipline.
- 31 The writer thinks the case for removing rules is often put by those the rules are meant to restrain.
- 32 The writer thinks small organisations suffer from this less than large ones.

Questions 33–37

Complete the sentences below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

- 33 Removing a rule is a bet against a failure that has not happened, placed by somebody who will be if it does.
- 34 Beyond the threshold the set can no longer be held in one or carried out in the time available.

- 35 Once compliance stops being uniform, the selection is until something goes wrong.
- 36 A rule written just after an incident is composed with maximum urgency and minimum
- 37 Each new rule should be given a named owner and a date for

Questions 38–40

Choose the correct letter, A, B, C or D.

- 38 Why does the writer say nobody is promoted for deleting a paragraph?
- A Deletion is forbidden in most organisations.
 - B Whoever removes a rule owns the next incident.
 - C Rule-books are written by lawyers.
 - D Deletion needs the approval of a committee.
- 39 Why does the writer choose an intensive-care ward as the illustration?
- A because the alarms in it were badly designed
 - B because every separate decision that produced it was reasonable
 - C because hospitals carry more rules than other organisations
 - D because staff there ignore alarms deliberately
- 40 Why does the writer reject an automatic expiry date?
- A It would remove too many rules at once.
 - B It is another way of removing rules with nobody owning the removal.
 - C It would cost too much to administer.
 - D Rules cannot lawfully be made to expire.