The coming back of the "Extinct" Grass in Britain

A. It's *Britain's dodo,* called interrupted brome because of its gappy seed-head, this unprepossessing grass was found nowhere else in the world. Sharp-eyed Victorian botanists were the first to notice it, and by the 1920s the odd-looking grass had been found across much of southern England. Yet its decline was just as dramatic. By 1972 it had vanished from its last toehold-two hay fields at Pampisford, near Cambridge. Even the seeds stored at the Cambridge University Botanic Garden as an insurance policy were dead, having been mistakenly kept at room temperature. Botanists mourned: a unique living entity was gone forever.

B. Yet reports of its demise proved premature. Interrupted brome has come back from the dead, and not through any fancy genetic engineering. Thanks to one green-fingered botanist, interrupted brome is alive and well and living as a pot plant. Britain's dodo is about to become a phoenix, as conservationists set about relaunching its career in the wild.

C. At first, Philip Smith was unaware that the scrawny pots of grass on his bench were all that remained of a uniquely British species. But when news of the "extinction" of Bromus interruptus finally reached him, he decided to astonish his colleagues. He seized his opportunity at a meeting of the Botanical Society of the British Isles in Manchester in 1979, where he was booked to talk about his research on the evolution of the brome grasses. It was sad, he said, that interrupted brome had become extinct, as there were so many interesting questions botanists could have investigated. Then he whipped out two enormous pots of it. The extinct grass was very much alive.

D. It turned out that Smith had collected seeds from the brome's last refuge at Pampisford in 1963, shortly before the species disappeared from the wild altogether. Ever since then, Smith had grown the grass on, year after year. So, in the end, the hapless grass survived not through some high-powered conservation scheme or fancy genetic manipulation, but simply because one man was interested in it. As Smith points out, interrupted brome isn't particularly attractive and has no commercial value. But to a plant taxonomist, that's not what makes a plant interesting.

E. The brome's future, at least in cultivation, now seems assured. Seeds from Smith's plants have been securely stored in the state-of-the-art Millennium Seed Bank at Wakehurst Place in Sussex. And living plants thrive at the botanic gardens at Kew, Edinburgh and Cambridge. This year, "bulking up" is underway to make sure there are plenty of plants in all gardens, and sackfuls of seeds are being stockpiled at strategic sites throughout the country.

F. The brome's relaunch into the British countryside is next on the agenda. English Nature has included interrupted brome in its Species Recovery Programme, and it is on track to be reintroduced into the agricultural landscape if friendly farmers can be found. Alas, the grass is neither pretty nor useful – in fact, it is undeniably a weed, and a weed of a crop that nobody grows these days, at that. The brome was probably never common enough to irritate farmers, but no one would value it today for its productivity or its nutritious qualities. As a grass, it leaves agriculturalists cold.

G. So where did it come from? Smith's research into the taxonomy of the brome grasses suggests that interruptus almost certainly mutated from another weedy grass, soft brome, *hordeaceus*. So close is the relationship that interrupted brome was originally deemed to be a mere variety of soft brome by the great Victorian taxonomist Professor Hackel. But in 1895, George Claridge Druce, a 45-year-old Oxford pharmacist with a shop on the High Street, decided that it deserved species status, and convinced the botanical world. Druce was by then well on his way

to fame as an Oxford don, mayor of the city, and a fellow of the Royal Society. A poor boy from Northamptonshire and a self-educated man, Druce became the leading field botanist of his generation. When Druce described a species, botanists took note.

H. The brome's parentage may be clear, but the timing of its birth is more obscure. According to agricultural historian Joan Thirsk, sainfoin and its friends made their first modest appearance in Britain in the early 1600s. seeds brought in from the Continent were sown in pastures to feed horses and other livestock. But in those early days, only a few enthusiasts – mostly gentlemen keen to pamper their best horses – took to the new crops.

I. Although the credit for the "discovery" of interrupted brome goes to a Miss A. M. Barnard, who collected the first specimens at Odsey, Bedfordshire, in 1849. The grass had probably lurked undetected in the English countryside for at least a hundred years. Smith thinks the botanical dodo probably evolved in the date 17th or early 18th century, once sainfoin became established.

J. Like many once-common arable weeds, such as the corncockle, interrupted brome seeds cannot survive long in the soil. Each spring, the brome relied on farmers to resow its seeds; in the days before weedkillers and sophisticated seed sieves, an ample supply would have contaminated stocks of crop seed. But fragile seeds are not the brome's only problem: this species is also reluctant to release its seeds as they ripen. Show it a ploughed field today and this grass will struggle to survive, says Smith. It will be difficult to establish in today's "improved" agricultural landscape, inhabited by notoriously vigorous competitors.

Questions 1-7

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

TRUE If the statement is true

FALSE If the statement is false

NOT GIVEN If the information is not given in the passage

1. The name for interrupted brome is very special as its head shaped like a sharp eye
2. Interrupted brome thought to become extinct because there was no live seed even in a labs condition.
3. Philip Smith comes from the University of Cambridge.
4. Reborn of the interrupted brome is attributed more to scientific meaning than seemingly aesthetic or commercial ones
5. English nature will operate to recover interrupted brome on the success of survival in Kew.
6. Interrupted Brome grows poorly in some competing modern agricultural environment with other plants.
7. Media publicity plays a significant role to make interrupted brome continue to exist.

Questions 8-13

Use the information in the passage to match the people (listed A-F) with opinions or deeds below.

Write the appropriate letters A-F in boxes 8-13 on your answer sheet.

NB You may use any letter more than once

A George Claridge Druce

B Nathaniel Fiennes

C Professor Hackel

D A. M. Barnard

E Philip Smith
J Joan Thirsk

Choose the people who

8. **reestablished the British unique plants**
9. **identified the interrupted brome as just to its parent brome**
10. **gave an independent taxonomy place to interrupted brome**
11. **discovered and picked the first sample of interrupted brome**
12. **recorded the first 'show up' of sainfoin plants in Britain**
13. **collected the last seeds just before its extinction**

London Swaying Footbridge

A. In September 1996 a competition was organized by the Financial Times in association with the London Borough of Southwark to design a new footbridge across the Thames. The competition attracted over 200 entries and was won by a team comprising Arup (engineers), Foster and Partners (architects) and the sculptor Sir Anthony Caro.

B. The bridge opened to the public on 10 June 2000. Up to 100,000 people crossed it that day with up to 2000 people on the bridge at any one time. At first, the bridge was still. Then it began to sway, just slightly. Then, almost from one moment to the next, when large groups of people were crossing, the wobble intensified. This movement became sufficiently large for people to stop walking to retain their balance and sometimes to hold onto the handrails for support. It was decided immediately to limit the number of people on the bridge, but even so, the deck movement was sufficient to be uncomfortable and to raise concern for public safety so that on 12 June the bridge was closed until the problem could be solved.

C. The embarrassed engineers found the videotape that day which showed the center span swaying about 3 inches side to side every second. The engineers first thought that winds might be exerting excessive force on the many large flags and banners bedecking the bridge for its gala premiere. What's more, they also discovered that pedestrians also played a key role. Human activities, such as walking, running, jumping, swaying, etc. could cause horizontal forces which in turn could cause excessive dynamic vibration in the lateral direction in the bridge. As the structure began moving, pedestrians adjusted their gait to the same lateral rhythm as the bridge. The adjusted footsteps magnified the motion – just like when four people all stand up in a small boat at the same time. As more pedestrians locked into the same rhythm, the increasing oscillations led to the dramatic swaying captured on film.

D. In order to design a method of reducing the movements, the force exerted by the pedestrians had to be quantified

and related to the motion of the bridge. Although there are some descriptions of this phenomenon in existing literature, none of these actually quantifies the force. So there was no quantitative analytical way to design the bridge against this effect. An immediate research program was launched by the bridge's engineering designers Ove Arup, supported by a number of universities and research organizations.

E. The tests at the University of Southampton involved a person walking 'on the spot' on a small shake table. The tests at Imperial College involved persons walking along with a specially built, 7.2m-long platform which could be driven laterally at different frequencies and amplitudes. Each type of test had its limitations. The Imperial College tests were only able to capture 7 – 8 footsteps, and the 'walking on the spot' tests, although monitoring many footsteps, could not investigate normal forward walking. Neither test could investigate any influence of other people in a crowd on the behavior of the individual being tested.

F. The results of the laboratory tests provided information which enabled the initial design of a retrofit to be progressed. However, the limitations of these tests were clear and it was felt that the only way to replicate properly the precise conditions of the Millennium Bridge was to carry out crowd tests on the bridge deck itself. These tests done by the Arup engineers could incorporate factors not possible in the laboratory tests. The first of these was carried out with 100 people in July 2000. The results of these tests were used to refine the load model for pedestrians. The second series of crowd tests were carried out on the bridge in December 2000. The purpose of these tests was to further validate the design assumptions and to load test a prototype damper installation. The test was carried out with 275 people.

G. Unless the usage of the bridge was to be greatly restricted, only two generic options to improve its performance were considered feasible. The first was to increase the stiffness of the bridge to move all its lateral natural frequencies out of the range that could be excited by the lateral football forces, and the second was to increase the damping of the bridge to reduce the resonant response.

Questions 14-17
Write FOUR correct letters, A-H.
Which FOUR of the following situation were witnessed on the opening ceremony of the bridge?

A The frequency of oscillation increased after some time.
B All the engineers went to see the ceremony that day.
C The design of the bridge astonished the people.
D Unexpected sideway movement of the bridge occurred.
E Pedestrians had difficulty in walking on the deck.
F The bridge fell down when people tried to retain their balance.
G Vibration could be detected on the deck by the pedestrians.
H It was raining when the ceremony began.

Questions 18-22
Complete the summary below.
Write NO MORE THAN THREE WORDS for each answer.
Write your answers in boxes 18-22 on your answer sheet.

After the opening ceremony, the embarrassed engineers tried to find out the reason for the bridge's wobbling. Judged from the videotape, they thought that 18……. and 19…….. might create an excessive force on the bridge. The distribution of 20…….. resulted from human activities could cause 21……. throughout the structure. This swaying prompted people to start adjusting the way they walk, which in turn reinforced the 22……..

Questions 23-26
Complete the table below.
Write NO MORE THAN THREE WORDS for each answer.
Write your answers in boxes 23-26 on your answer sheet.

Research programs launched by universities and organizations	
Universities / People	**Activity**
Test at 23…… **'walking on the spot' at Southampton** **Crowd test conducted by 25……**	**Limited ability to have 7-8 footsteps** **Not enough data on 24……** **Aim to verify 26……**

Book review on Musicophilia

Norman M. Weinberger reviews the latest work of Oliver Sacks on music.

A. Music and the brain are both endlessly fascinating subjects, and as a neuroscientist specialising in auditory learning and memory, I find them especially intriguing. So I had high expectations of Musicophilia, the latest offering from neurologist and prolific author Oliver Sacks. And I confess to feeling a little guilty reporting that my reactions to the book are mixed.

B. Sacks himself is the best part of Musicophilia. He richly documents his own life in the book and reveals highly personal experiences. The photograph of him on the cover of the book-which shows him wearing headphones, eyes closed, clearly enchanted as he listens to Alfred Brendel perform Beethoven's Pathetique Sonata-makes a positive impression that is borne out by the contents of the book. Sacks' voice throughout is steady and erudite but never pontifical. He is neither self-conscious nor self-promoting.

C. The preface gives a good idea of what the book will deliver. In it, Sacks explains that he wants to convey the insights gleaned from the "enormous and rapidly growing body of work on the neural underpinnings of musical perception and imagery, and the complex and often bizarre disorders to which these are prone." He also stresses the importance of "the simple art of observation" and "the richness of the human context." He wants to combine "observation and description with the latest in technology," he says, and to imaginatively enter into the experience of his patients and subjects. The reader can see that Sacks, who has been practicing neurology for 40 years, is torn between the "old-fashioned" path of observation and the new-fangled, high-tech approach: He knows that he needs to take heed of the latter, but his heart lies with the former.

D. The book consists mainly of detailed descriptions of cases, most of them involving patients whom Sacks has seen in his practice. Brief discussions of contemporary neuroscientific reports are sprinkled liberally throughout the text. Part, "Haunted by Music," begins with the strange case of Tony Cicoria, a nonmusical, middle-aged surgeon who was consumed by a love of music after being hit by lightning. He suddenly began to crave listening to piano music, which he had never cared for in the past. He started to play the piano and then to compose music, which arose spontaneously in his mind in a "torrent" of notes. How could this happen? Was the cause psychological? (He had had a near-death experience when the lightning struck him.) Or was it the direct result of a change in the auditory regions of his cerebral cortex? Electroencephalography (EEG) showed his brain waves to be normal in the mid-1990s, just after his trauma and subsequent "conversion" to music. There are now more sensitive tests, but Cicoria, has declined to undergo them; he does not want to delve into the causes of his musicality. What a shame!

E. Part II, "A Range of Musicality," covers a wider variety of topics, but unfortunately, some of the chapters offer little or nothing that is new. For example, chapter 13, which is five pages long, merely notes that the blind often has better hearing than the sighted. The most interesting chapters are those that present the strangest cases. Chapter 8 is about "amusia," an inability to hear sounds like music, and "dysharmonia," a highly specific impairment of the ability to hear harmony, with the ability to understand melody left intact. Such specific "dissociations" are found throughout the cases Sacks recounts.

F. To Sacks's credit, part III, "Memory, Movement and Music," brings us into the underappreciated realm of music therapy. Chapter 16 explains how "melodic intonation therapy" is being used to help expressive aphasic patients (those unable to express their thoughts verbally following a stroke or other cerebral incident) once again become capable of fluent speech. In chapter 20, Sacks demonstrates the near-miraculous power of music to animate Parkinson's patients and other people with severe movement disorders, even those who are frozen into odd postures. Scientists cannot yet explain how music achieves this effect.

G. To readers who are unfamiliar with neuroscience and music behavior, Musicophilia may be something of a revelation. But the book will not satisfy those seeking the causes and implications of the phenomena Sacks describes. For one thing, Sacks appears to be more at ease discussing patients than discussing experiments. And he tends to be rather uncritical in accepting scientific findings and theories.

H. It's true that the causes of music-brain oddities remain poorly understood. However, Sacks could have done more to draw out some of the implications of the careful observations that he and other neurologists have made and of the treatments that have been successful. For example, he might have noted that the many specific dissociations among components of music comprehension, such as loss of the ability to perceive harmony but not melody, indicate that there is no music center in the brain. Because many people who read the book are likely to believe in the brain localisation of all mental functions, this was a missed educational opportunity.

I. Another conclusion one could draw is that there seem to be no "cures" for neurological problems involving music. A drug can alleviate a symptom in one patient and aggravate it in another or can have both positive and negative effects in the same patient. Treatments mentioned seem to be almost exclusively antiepileptic medications, which "damp down" the excitability of the brain in general; their effectiveness varies widely.

J. Finally, in many of the cases described here the patient with music-brain symptoms is reported to have "normal" EEG results. Although Sacks recognises the existence of new technologies, among them far more sensitive ways to analyze brain waves than the standard neurological EEG test, he does not call for their use. In fact, although he exhibits the greatest compassion for patients, he conveys no sense of urgency about the pursuit of new avenues in the diagnosis and treatment of music-brain disorders. This absence echoes the book's preface, in which Sacks expresses fear that "the simple art of observation may be lost" if we rely too much on new technologies. He does call for both approaches, though, and we can only hope that the neurological community will respond.

Questions 27-30
Write the correct letter, A, B, C or D.
Write your answers in boxes 27-30 on your answer sheet.

27. Why does the writer have a mixed feeling about the book?
A The guilty feeling made him so.
B The writer expected it to be better than it was.
C Sacks failed to include his personal stories in the book.
D This is the only book written by Sacks.

28. What is the best part of the book?
A the photo of Sacks listening to music
B the tone of voice of the book
C the autobiographical description in the book
D the description of Sacks' wealth

29. In the preface, what did Sacks try to achieve?
A make a herald introduction of the research work and technique applied
B give a detailed description of various musical disorders
C explain why he needs to do away with the simple observation
D explain why he needs to do away with the simple observation

30. What is disappointing about Tony Cicoria's case?
A He refuses to have further tests.

B He can't determine the cause of his sudden musicality.
C He nearly died because of the lightening.
D His brain waves were too normal to show anything.

Questions 31-36
Do the following statements agree with the views of the writer in Reading Passage 3?
In boxes 31-36 on your answer sheet, write

TRUE	**If the statement agrees with the views of the writer**
FALSE	**If the statement contradicts with the views of the writer**
NOT GIVEN	**If it is impossible to say what the writer thinks about this**

31. It is difficult to give a well-reputable writer a less than totally favorable review.
32. Beethoven's Pathetique Sonata is a good treatment for musical disorders.
33. Sacks believes technological methods is of little importance compared with traditional observation when studying his patients.
34. It is difficult to understand why music therapy is undervalued
35. Sacks held little skepticism when borrowing other theories and findings in describing reasons and notion for phenomena he depicts in the book.
36. Sacks is in a rush to use new testing methods to do treatment for patients.

Questions 37-40
Complete each sentence with the correct ending, A-F, below.
Write the correct letter, A-F, in boxes 37-40 on your answer sheet.

37. The content covered dissociations in understanding between harmony and melody
38. The study of treating musical disorders
39. The EEG scans of Sacks' patients
40. Sacks believes testing based on new technologies

A show no music-brain disorders.
B indicates that medication can have varied results.
C is key for the neurological community to unravel the mysteries.
D should not be used in isolation.
E indicate that not everyone can receive a good education.
F show a misconception that there is a function centre localized in the brain