

tpo_12_passage_1

We all know that many more people today are right-handed than left-handed. Can one trace this same pattern far back in prehistory? Much of the evidence about right-hand versus left-hand dominance comes from stencils and prints found in rock shelters in Australia and elsewhere, and in many Ice Age caves in France, Spain, and Tasmania. When a left hand has been stenciled, this implies that the artist was right-handed, and vice versa. Even though the paint was often sprayed on by mouth, one can assume that the dominant hand assisted in the operation. One also has to make the assumption that hands were stenciled palm downward—a left hand stenciled palm upward might of course look as if it were a right hand. Of 158 stencils in the French cave of Gargas, 136 have been identified as left, and only 22 as right; right-handedness was therefore heavily predominant. Cave art furnishes other types of evidence of this phenomenon. Most engravings, for example, are best lit from the left, as befits the work of right-handed artists, who generally prefer to have the light source on the left so that the shadow of their hand does not fall on the tip of the engraving tool or brush. In the few cases where an Ice Age figure is depicted holding something, it is mostly, though not always, in the right hand. Clues to right-handedness can also be found by other methods. Right-handers tend to have longer, stronger, and more muscular bones on the right side, and Marcellin Boule as long ago as 1911 noted the La Chapelle-aux-Saints Neanderthal skeleton had a right upper arm bone that was noticeably stronger than the left. Similar observations have been made on other Neanderthal skeletons such as La Ferrassie I and Neanderthal itself. Fractures and other cut marks are another source of evidence. Right-handed soldiers tend to be wounded on the left. The skeleton of a 40- or 50-year-old Nabatean warrior, buried 2,000 years ago in the Negev Desert, Israel, had multiple healed fractures to the skull, the left arm, and the ribs. Tools themselves can be revealing. Long-handed Neolithic spoons of yew wood preserved in Alpine villages dating to 3000 B.C., have survived; the signs of rubbing on their left side indicate that their users were right-handed. The late Ice Age rope found in the French cave of Lascaux consists of fibers spiraling to the right, and was therefore tressed by a righthander. Occasionally one can determine whether stone tools were used in the right hand or the left, and it is even possible to assess how far back this feature can be traced. In stone toolmaking experiments, Nick Toth, a right-hander, held the core (the stone that would become the tool) in his left hand and the hammer stone in his right. As the tool was made, the core was rotated clockwise, and the flakes, removed in sequence, had a little crescent of cortex (the core's outer surface) on the side. Toth's knapping produced 56 percent flakes with the cortex on the right, and 44 percent left-oriented flakes. A left-handed toolmaker would produce the opposite pattern. Toth has applied these criteria to the similarly made pebble tools from a number of early sites (before 1.5 million years) at Koobi Fora, Kenya, probably made by *Homo habilis*. At seven sites he found that 57 percent of the flakes were right-oriented, and 43 percent left, a pattern almost identical to that produced today. About 90 percent of modern humans are right-handed: we are the only mammal with a preferential use of one hand. The part of the brain responsible for fine control and movement is located in the left cerebral hemisphere, and the findings above suggest that the human brain was already asymmetrical in its structure and function not long after 2 million years ago. Among Neanderthals of 70,000–35,000 years ago, Marcellin Boule noted that the La Chapelle-aux-Saints individual had a left hemisphere slightly bigger than

the right, and the same was found for brains of specimens from Neanderthal, Gibraltar, and La Quina.

question 1

It can be inferred from paragraph 1 that even when paint was sprayed by mouth to make a hand stencil

- A there was no way to tell which hand was stenciled
- B the stenciled hand was the weaker hand
- C the stenciled hand was the dominant hand
- D artists stenciled more images of the dominant hand than they did of the weak

question 2

Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

- A Right-handed artists could more easily have avoided casting shadows on their work, because engravings in prehistoric caves were lit from the left.
- B The tips of engraving tools and brushes indicate that these instruments were used by right-handed artists whose work was lit from the left.
- C The best lighting for most engravings suggests that they were made by right-handed people trying to avoid the shadow of their hands interfering with their work.
- D Right-handed artists try to avoid having the brush they are using interfere with the light source.

question 3

All of the following are mentioned in paragraphs 1 and 2 as evidence of right-handedness in art and artists EXCEPT

- A the ideal source of lighting for most engravings
- B the fact that a left hand stenciled palm upward might look like a right hand
- C the prevalence of outlines of left hands

D figures in prehistoric art holding objects with the right hand

question 4

According to paragraph 3, the La Chapelle-aux-Saints Neanderthal skeleton can be identified as right-handed because

A other Neanderthal skeletons found nearby are also right-handed

B the right arm bone is stronger than the left

C it is similar to skeletons of La Ferrassie I and Neanderthal

D the right side of the skeleton shows less evidence of fractures

question 5

Which of the following statements about fractures and cut marks can be inferred from paragraph 4?

A Fractures and cut marks caused by right-handed soldiers tend to occur on the right side of the injured party's body.

B The right arm sustains more injuries because, as the dominant arm, it is used more actively.

C In most people, the left side of the body is more vulnerable to injury since it is not defended effectively by the dominant arm.

D Fractures and cut marks on fossil humans probably occurred after death.

question 6

According to paragraph 5, what characteristic of a Neolithic spoon would imply that the spoon's owner was right-handed?

A The direction of the fibers

B Its long handle

C The yew wood it is carved from

D Wear on its left side

question 7

In paragraph 5, why does the author mention the Ice Age rope found in the French cave of Lascaux?

- A As an example of an item on which the marks of wear imply that it was used by a right-handed person
- B Because tressing is an activity that is easier for a right-handed person than for a left-handed person
- C Because the cave of Lascaux is the site where researchers have found several prehistoric tools made for right-handed people
- D As an example of an item whose construction shows that it was right handed made by a right-person

question 8

What was the purpose of Toth's toolmaking experiment described in paragraph 6?

- A To shape tools that could be used by either hand
- B To produce replicas of early tools for display in museums
- C To imitate the production of pebble tools from early sites
- D To determine which hand made the early tools

question 9

What is the author's primary purpose in paragraph 7?

- A To illustrate the importance of studying the brain
- B To demonstrate that human beings are the only mammal to desire fine control of movement

C To contrast the functions of the two hemispheres of the brain

D To demonstrate that right-hand preference has existed for a long time

question 10

Look at the four squares [] that indicate where the following sentence could be added to the passage. Where would the sentence best fit?

We all know that many more people today are right-handed than left-handed. Can one trace this same pattern far back in prehistory? [] Much of the evidence about right-hand versus left-hand dominance comes from stencils and prints found in rock shelters in Australia and elsewhere, and in many Ice Age caves in France, Spain, and Tasmania. [] When a left hand has been stenciled, this implies that the artist was right-handed, and vice versa. [] Even though the paint was often sprayed on by mouth, one can assume that the dominant hand assisted in the operation. One also has to make the assumption that hands were stenciled palm downward—a left hand stenciled palm upward might of course look as if it were a right hand. [] Of 158 stencils in the French cave of Gargas, 136 have been identified as left, and only 22 as right; right-handedness was therefore heavily predominant. Cave art furnishes other types of evidence of this phenomenon. Most engravings, for example, are best lit from the left, as befits the work of right-handed artists, who generally prefer to have the light source on the left so that the shadow of their hand does not fall on the tip of the engraving tool or brush. In the few cases where an Ice Age figure is depicted holding something, it is mostly, though not always, in the right hand. Clues to right-handedness can also be found by other methods. Right-handers tend to have longer, stronger, and more muscular bones on the right side, and Marcellin Boule as long ago as 1911 noted the La Chapelle-aux-Saints Neanderthal skeleton had a right upper arm bone that was noticeably stronger than the left. Similar observations have been made on other Neanderthal skeletons such as La Ferrassie I and Neanderthal itself. Fractures and other cut marks are another source of evidence. Right-handed soldiers tend to be wounded on the left. The skeleton of a 40- or 50-year-old Nabatean warrior, buried 2,000 years ago in the Negev Desert, Israel, had multiple healed fractures to the skull, the left arm, and the ribs. Tools themselves can be revealing. Long-handed Neolithic spoons of yew wood preserved in Alpine villages dating to 3000 B.C., have survived; the signs of rubbing on their left side indicate that their users were right-handed. The late Ice Age rope found in the French cave of Lascaux consists of fibers spiraling to the right, and was therefore tressed by a righthander. Occasionally one can determine whether stone tools were used in the right hand or the left, and it is even possible to assess how far back this feature can be traced. In stone toolmaking experiments, Nick Toth, a right-hander, held the core (the stone that would become the tool) in his left hand and the hammer stone in his right. As the tool was made, the core was rotated clockwise, and the flakes, removed in sequence, had a little crescent of cortex (the core's outer surface) on the side. Toth's knapping produced 56 percent flakes with the cortex on the right, and 44 percent left-oriented flakes. A left-handed toolmaker would produce the opposite pattern. Toth has applied these criteria to the similarly made pebble

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