
"Darwinism's Effect on Science" by Matthew Miner (2014)

For much of the history of human thought, the sciences have studied subjects that seemed to be eternal and unchanging. Even the basic laws of the Nile's flooding were investigated in the hopes of finding never-altering laws. Similarly, the scientific investigations of the ancient Near East and Greece into the regular laws of the stars ultimately looked for constant patterns. This overall pattern of scientific reasoning has left deep marks on the minds of almost all thinkers and found its apotheosis in modern physics. From the time of the early renaissance to the nineteenth century, physics represented the ultimate expression of scientific investigation for almost all thinkers. Its static laws appeared to be the unchanging principles of all motion and life on earth. By the nineteenth century, it had appeared that only a few details had to be "cleared up" before all science was basically known.

In many ways, this situation changed dramatically with the arrival of Darwinism. It would change even more dramatically in early twentieth-century physics as well. Darwin's theories of evolution challenged many aspects of the "static" worldview. Even those who did not believe that a divine being created an unchanging world were shaken by the new vistas opened up to science by his studies. It had been a long-accepted inheritance of Western culture to believe that the species of living organisms were unchanging in nature. Though there might be many different kinds of creatures, the kinds themselves were not believed to change. The thesis of a universal morphing of types shattered this cosmology, replacing the old world-view with a totally new one. Among the things that had to change in light of Darwin's work was the very view of science held by most people.

Question 1:

According to the passage, what is the source of modern science?

- (A) *Greek astronomy*
- (B) *None of the other answers*
- (C) *Egyptian mathematics*
- (D) *Renaissance scientists*
- (E) *Renaissance humanists*

Correct Answer:

- (A) Greek astronomy

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Question 2:

Which of the following gives the best example of the "static worldview" discussed in the second paragraph?

- (A) *"In many ways, this situation changed dramatically with the arrival of Darwinism."*
- (B) *"The thesis of a universal morphing of types shattered this cosmology, replacing the old world-view with a totally new one."*
- (C) *"Among the things that had to change in light of Darwin's work was the very view of science held by most people."*
- (D) *"Even those who did not believe that a divine being created an unchanging world were shaken by the new vistas opened up to science by his studies."*
- (E) *"Though there might be many different kinds of creatures, the kinds themselves were not believed to change."*

Correct Answer:

(E) "Though there might be many different kinds of creatures, the kinds themselves were not believed to change."

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Question 3:

Consider the underlined sentence. What was the new "cosmology" that arose after Darwin's day?

The thesis of a universal morphing of types shattered this cosmology, replacing the old world-view with a totally new one.

- (A) *A completely areligious outlook on life.*
- (B) *The view of the world as an unchanging whole to be investigated by science.*
- (C) *The belief that history was an important but secondary aspect of scientific studies.*
- (D) *None of the other answers*
- (E) *The view of the world as a changing reality with its own historical nature.*

Correct Answer:

(E) The view of the world as a changing reality with its own historical nature.

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Question 4:

Given Darwin's statements, which of the following should be expected?

- (A) *Humanity as it is today has reached its fixed state.*
- (B) *There were no dogs at one time in the earth's history.*
- (C) *Although we do not train bears as pets today, we may well in years to come.*
- (D) *Ancient physics was completely worthless.*
- (E) *Human beings will likely all die in a massive nuclear war.*

Correct Answer:

- (B) There were no dogs at one time in the earth's history.

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Question 5:

Which of the following provides an example of the main idea asserted in the first paragraph?

- (A) *Religion constantly wanes with the rise of science.*
- (B) *The interest in science only arises once agriculture reaches a certain point of fixity.*
- (C) *The fluctuation of coloration within a species is rather minimal.*
- (D) *None of the other answers*
- (E) *The Pythagorean theorem is based upon the constant relationship of the sides of a right triangle to its hypotenuse.*

Correct Answer:

- (E) The Pythagorean theorem is based upon the constant relationship of the sides of a right triangle to its hypotenuse.

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Adapted from Jack London's *The Road* (1907)

Barring accidents, a good hobo, with youth and agility, can hold a train down despite all the efforts of the train-crew to "ditch" him—given, of course, nighttime as an essential condition. When such a hobo, under such conditions, makes up his mind that he is going to hold her down, either he does hold her down, or chance trips him up. There is no legitimate way, short

of murder, whereby the train-crew can ditch him. That train-crews have not stopped short of murder is a current belief in the tramp world. Not having had that particular experience in my 7

tramp days I cannot vouch for it personally.

But this I have heard of the "bad" roads. When a tramp has "gone underneath," on the rods, and the train is in motion, there is apparently no way of dislodging him until the train stops. The tramp, snugly ensconced inside the truck, with the four wheels and all the framework around him, has the "cinch" on the crew—or so he thinks, until some day he rides the rods on a bad road. A bad road is usually one on which a short time previously one or several trainmen have been killed by tramps. Heaven pity the tramp who is caught "underneath" on such a road—for caught he is, though the train be going sixty miles an hour.

The "shack" (brakeman) takes a coupling-pin and a length of bell-cord to the platform in front of the truck in which the tramp is riding. The shack fastens the coupling-pin to the bell-cord, drops the former down between the platforms, and pays out the latter. The coupling-pin strikes the ties between the rails, rebounds against the bottom of the car, and again strikes the ties. The shack plays it back and forth, now to this side, now to the other, lets it out a bit and hauls it in a bit, giving his weapon opportunity for every variety of impact and rebound. Every blow of that flying coupling-pin is freighted with death, and at sixty miles an hour it beats a veritable tattoo of death. The next day the remains of that tramp are gathered up along the right of way, and a line in the local paper mentions the unknown man, undoubtedly a tramp, assumably drunk, who had probably fallen asleep on the track.

Question 6:

Given the author's description of the train crew's behavior, which of the following is an analogous behavior?

- (A) A football coach who advises his own players to seriously injure the opposing players.
- (B) A ship captain who allows a stowaway to fall off the deck through the normal actions of the working of the ship.
- (C) A school principal who makes many students drop out of school due to excessively harsh rules.
- (D) A senator who ignores his constituents' needs for his own profit.
- (E) An airline pilot who forces a rowdy passenger off of the plane before take-off.

Correct Answer:

(A) A football coach who advises his own players to seriously injure the opposing players.

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Question 7:

The author ends the passage by noting the newspaper says the man fell asleep in order to

- (A) convince the reader that trains are an incredibly dangerous form of transportation
- (B) show how little people care about tramps
- (C) indicate the dangers of sleeping on train tracks
- (D) show sympathy with the train crew that finds a man under the train
- (E) mock the hobo who gets "caught" under a train

Correct Answer:

(B) show how little people care about tramps

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Question 8:

If the author included the perspective of the train crew, what effect would that have on the overall perspective of the passage?

- (A) It would create confusion over the actual circumstances of a hobo's death.
- (B) It would portray the train crew as malicious and vindictive.
- (C) It would portray the hobos in a less favorable light.
- (D) It would make the local newspapers look more untrustworthy.
- (E) It would make train crews much less sympathetic to the reader.

Correct Answer:

(C) It would portray the hobos in a less favorable light.

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Question 9:

What can be inferred about the position of the average newspaper reporter regarding hobos?

- (A) They believe train crews should be prosecuted when they harm hoboes.
- (B) They see hoboes as a quintessential part of American society.
- (C) They view the hobo lifestyle as a romantic endeavor.
- (D) They generally look down on the hobo lifestyle.

(E) They believe hoboes should be protected by new governmental regulations.

Correct Answer:

(D) They generally look down on the hobo lifestyle.

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Adapted from "Humming-Birds: As Illustrating the Luxuriance of Tropical Nature" in *Tropical Nature, and Other Essays* by Alfred Russel Wallace (1878)

The food of hummingbirds has been a matter of much controversy. All the early writers down to Buffon believed that they lived solely on the nectar of flowers, but since that time, every close observer of their habits maintains that they feed largely, and in some cases wholly, on insects. Azara observed them on the La Plata in winter taking insects out of the webs of spiders at a time and place where there were no flowers. Bullock, in Mexico, declares that he saw them catch small butterflies, and that he found many kinds of insects in their stomachs. Waterton made a similar statement. Hundreds and perhaps thousands of specimens have since been dissected by collecting naturalists, and in almost every instance their stomachs have been found full of insects, sometimes, but not generally, mixed with a proportion of honey. Many of them in fact may be seen catching gnats and other small insects just like fly-catchers, sitting on a dead twig over water, darting off for a time in the air, and then returning to the twig. Others come out just at dusk, and remain on the wing, now stationary, now darting about with the greatest rapidity, imitating in a limited space the evolutions of the goatsuckers, and evidently for the same end and purpose. Mr. Gosse also remarks, "All the hummingbirds have more or less the habit, when in flight, of pausing in the air and throwing the body and tail into rapid and odd contortions. This is most observable in the *Polytmus*, from the effect that such motions have on the long feathers of the tail. That the object of these quick turns is the capture of insects, I am sure, having watched one thus engaged pretty close to me."

Question 10:

What can we infer from the underlined sentence, "Many [hummingbirds] in fact may be seen catching gnats and other small insects just like fly-catchers, sitting on a dead twig over water, darting off for a time in the air, and then returning to the twig"?

(A) *Some hummingbirds live in the desert.*

(B) *All hummingbirds live in the desert.*

(C) *Gnats are rarely found near bodies of water.*

(D) *All hummingbirds live near bodies of water.*

(E) *Some hummingbirds live near bodies of water.*

Correct Answer:

(E) Some hummingbirds live near bodies of water.

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Question 11:

What do Azara, Bullock, and Waterton have in common?

- (A) *They are all types of hummingbirds.*
- (B) *They are all critics of the writer and disagree with his theory.*
- (C) *They are all types of birds that eat insects.*
- (D) *They are all scientists who think hummingbirds eat insects.*
- (E) *They are all scientists who think hummingbirds eat flower nectar.*

Correct Answer:

(D) They are all scientists who think hummingbirds eat insects.

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Question 12:

Which of the following does the author contrast in this passage?

- (A) *Hummingbirds with long tails and hummingbirds with short tails*
- (B) *The results of feeding a hummingbird insects and the results of feeding a hummingbird flower nectar*
- (C) *The author's opinion about what hummingbirds eat and Mr. Gosse's opinion about what hummingbirds eat*
- (D) *Hummingbirds that eat flower nectar and hummingbirds that eat insects*
- (E) *The beliefs of historical scientists and the beliefs of scientists of the author's time*

Correct Answer:

(E) The beliefs of historical scientists and the beliefs of scientists of the author's time

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Adapted from "Introductory Remarks" in *The Interpretation of Dreams* by Sigmund Freud
(trans. 1913)

In attempting to discuss the interpretation of dreams, I do not believe that I have overstepped the bounds of neuropathological interest. For, when investigated psychologically, the dream proves to be the first link in a chain of abnormal psychic structures whose other links—the hysterical phobia, the obsession, and the delusion—must interest the physician for practical reasons. The dream can lay no claim to a corresponding practical significance; however, its theoretical value is very great, and one who cannot explain the origin of the content of dreams will strive in vain to understand phobias, obsessive and delusional ideas, and likewise their therapeutic importance.

While this relationship makes our subject important, it is responsible also for the deficiencies in this work. The surfaces of fracture, which will be frequently discussed, correspond to many points of contact where the problem of dream formation informs more comprehensive problems of psychopathology which cannot be discussed here. These larger issues will be elaborated upon in the future.

Peculiarities in the material I have used to elucidate the interpretation of dreams have rendered this publication difficult. The work itself will demonstrate why all dreams related in scientific literature or collected by others had to remain useless for my purpose. In choosing my examples, I had to limit myself to considering my own dreams and those of my patients who were under psychoanalytic treatment. I was restrained from utilizing material derived from my patients' dreams by the fact that during their treatment, the dream processes were subjected to an undesirable complication—the intermixture of neurotic characters. On the other hand, in discussing my own dreams, I was obliged to expose more of the intimacies of my psychic life than I should like, more so than generally falls to the task of an author who is not a poet but an investigator of nature. This was painful, but unavoidable; I had to put up with the inevitable in order to demonstrate the truth of my psychological results at all. To be sure, I disguised some of my indiscretions through omissions and substitutions, though I feel that these detract from the value of the examples in which they appear. I can only express the hope that the reader of this work, putting himself in my difficult position, will show patience, and also that anyone inclined to take offense at any of the reported dreams will concede freedom of thought at least to the dream life.

Question 13:

The author of this passage is most interested in \hspace{2cm}.

- (A) *the workings of the human mind*
- (B) *the ability of certain dreams to foreshadow future events*
- (C) *the similarities between human brains and the brains of other mammals*
- (D) *the physical structure of the brain*
- (E) *the role of criticism in science*

Correct Answer:

(A) the workings of the human mind

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Question 14:

When he uses the underlined phrase "the inevitable," the author is referring to \hspace{2cm}.

(A) the discomfort that everyone feels when discussing dreams with other people

(B) the idea that all dreams contain significant meaning

(C) the scorn of many important psychologists upon his publication of his work on dreams

(D) the fact that he had to publish some of his own dreams, which made him uncomfortable

(E) the gradual loss of detail in what one can remember about a dream

Correct Answer:

(D) the fact that he had to publish some of his own dreams, which made him uncomfortable

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Question 15:

Based on the way in which the underlined word "informs" is used in the passage, the author is using it to mean \hspace{2cm}.

(A) influences

(B) tells

(C) requires

(D) solves

(E) ignores

Correct Answer:

(A) influences

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