

What Do Flies Think About?

From *Ideas & Discoveries Magazine*

It seems unbelievable, but an insect's brain is more brilliant than any supercomputer. That's why researchers are studying flies and bees to understand their cognition. Food for thought . . .

5 Though it may seem like a mundane question, there is serious science behind it: Why is a common housefly able to land on a ceiling? After all, the insect flies with its feet down when it's below the ceiling, yet, in the blink of an eye, the fly is suddenly perched with feet upward. The explanation for the fly's aerial feat is important because it can reveal a lot about what the insect's brain is capable of. Regardless of how the fly manages the landing, its tiny brain (which consists of only 100,000 nerve cells) has to go into high gear to carry
10 it out. For a long time, scientists believed the flies turn around in flight much like a fighter pilot performs loops. This would require them to first "visualize" a mental rotation—in other words, to plan the loop beforehand.

 It was only recently that researchers discovered how a fly *actually* lands on a ceiling. Using a high-speed camera, they discovered that flies don't perform a loop after all.
15 Instead, they stretch out their front legs over their head and toward the ceiling. As soon as the legs make contact with the ceiling, the fly swings its body around 180 degrees like a gymnast on a horizontal bar. Then it simply attaches itself to the ceiling with all its legs. This precision landing requires perfect coordination of all its muscles. The fly's swinging motion also needs to be calculated, which means information shoots through its body in
20 the space of milliseconds. Not even an autopilot system controlled by a high-tech computer could carry out such a maneuver.

 Bees are a favorite experimental creature for researchers because they are easy to breed and are considered the "Einsteins" of the insect world. These striped geniuses perform intellectual feats that cannot be taken for granted, even among mammals. Bees can count,
25 distinguish between objects like humans and dogs, recognize complex shapes, learn things, navigate across great distances and remember their routes, and return to their hives and tell other bees exactly where the tastiest flowers are. Compare that with the difficulties humans can have when finding their way around an unfamiliar city without a map—not to mention having to describe to friends the route they took. "Brain size is not necessarily
30 an indicator of intelligence," says bee researcher Lars Chittka at Queen Mary, University of London. "Larger brains usually utilize the same circuits over and over again. This might make for more detailed thinking or remembering, but it doesn't guarantee the thoughts or memories will be better."

35 Bees are also social insects that create complex colony systems and display a high degree of social behavior. The idea of life in a group is firmly rooted in their brains— which is what makes bees so interesting to brain researchers. We, too, are social creatures, after all, and scientists suspect that certain neuronal circuits have changed very little over the course of evolution. In other words, bee brains could provide us with information on nerve connections that will help us better understand our own human nature and how we think.

40 Researchers already know that insects living in groups need to have more computing power in their head. This is illustrated by the fact that all social insects have a larger brain than their loner counterparts. A key factor in this discovery was a study conducted by biologists at a Smithsonian lab in Panama. The country is home to a bee species that
45 contains some members that live alone and others that form groups. The biologists discovered that the loner bees also had a smaller brain. So it appears that a larger brain is a consequence of group living. The same phenomenon is even more pronounced among several species of locusts that begin life alone and later join up to form giant swarms: As soon as they get together, their brains begin to grow by one-third. It's likely they need to
50 possess greater thinking capacity in order to compete with rivals in the swarm. It's also likely that flying and communicating in a swarm is more difficult than doing those things alone. The biologists still don't know how locusts get their brains to grow. The explanation, should it be found, might be of interest to medical researchers looking into treatments for paralysis or strokes. In any case, the researchers have found substances in
55 the locusts' brain that are extremely effective at killing bacteria. These substances are not related to any known antibiotics, so they could possibly pave the way for new medications in the future.

Such discoveries are definitely pointing scientists in a new direction. However, practically no insect brain researcher has gone as far as Atsushi Takashima at the Tokyo
60 Institute of Technology in Japan. Takashima has inserted electrodes into the brains of male moths that he then uses as control units for a robot. Whenever the moth-machine hybrid catches the scent of a female moth, it begins to search for the source. "Chemical substances do not spread out uniformly in air," Takashima explains. "So even though their concentrations increase as you get closer to their source, the effects of wind and air
65 currents make an analysis extremely difficult. But thanks to evolution, insect brains have developed techniques to get around this problem." Takashima's research has significant applications: His goal is to create robots that can sniff out explosives or dangerous chemicals in the air and locate their source. One day a processor will control such robots, but for now, a moth's brain is far superior to any supercomputer on the market.

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1

The author compares flies to fighter pilots in lines 10 and 11 to show that flies are

- A complicated
- B forceful
- C skillful
- D mysterious

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2

The sentences in lines 18 through 21 develop a key concept of the article by

- A demonstrating how carefully a fly must target its landing place
- B revealing the difficulty of conducting research on how a fly lands
- C illustrating the complexity of the process a fly's brain must control
- D explaining how rapidly the fly's landing occurs after it makes a loop

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3

What information best develops the view that bees are "the 'Einsteins' of the insect world" (line 23)?

- A the discussion about the larger brain sizes of bees
- B the list of intellectual feats that bees can accomplish
- C the reasons that researchers are interested in studying bees
- D the information about the complex colonies that bees live in

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4

Which central idea of the article is most supported by lines 34 through 40?

- A Social insects develop larger brains.
- B Brain structures have changed little over time.
- C Bee colonies can help us understand social systems.
- D Insect brains can help us understand the human brain.

5

Which evidence from the article best supports the claim in lines 41 and 42?

- A "Larger brains usually utilize the same circuits over and over again." (line 31)
- B "The idea of life in a group is firmly rooted in their brains—which is what makes bees so interesting to brain researchers." (lines 35 and 36)
- C "We, too, are social creatures, after all, and scientists suspect that certain neuronal circuits have changed very little over the course of evolution." (lines 36 through 38)
- D "It's likely they need to possess greater thinking capacity in order to compete with rivals in the swarm." (lines 49 and 50)

6

What is the most likely reason for including information about the Smithsonian laboratory in Panama?

- A to emphasize the results of a major study about bees
- B to illustrate why biologists should conduct bee research
- C to point out that biologists still know very little about locust brains
- D to provide evidence that other countries are performing studies of locust brains

7

Lines 58 through 69 suggest that the author believes

- A the study of moths will reveal changes in insect brains
- B the study of moths can provide ways to enhance technology
- C moth research will teach scientists more about the human brain
- D scientists should develop more advanced methods of moth research

Directions

Read this passage. Then answer questions 8 through 14.

The Diving Horse

by John B. Abbott, Jr.

Fall of 1959. That was the year Fidel Castro seized power in Cuba; Alaska and Hawaii joined the Union as our 49th and 50th states, respectively; and *Guns, Smoke* reigned as the top TV series. Charlton Heston collected an Academy Award for *Ben-Hur*, and Leon Uris's *Exodus* topped the reading lists. In Garwood, New Jersey, a child picked up his favorite Golden Books¹ and stood outside of his parents' apartment building, waiting for the school bus. What a sight: a chubby boy in black high-top Keds, jeans, and a flannel shirt, patiently waiting and watching for the bus that, when it finally did rumble down Willow Avenue, passed him by. The driver didn't think to stop, which made perfect sense since her route schedule didn't include three-year-olds—not even three-year-old me.

"The bus didn't stop for me," I complained to my mother that day.

"Oh, really?" she calmly replied. Later she would say that the only surprise was the age at which I wanted to start going to school. But it shouldn't have surprised her really, because as the son of a pair of avid readers, I grew up in a house abundant with opportunities to read and write. Newspapers, magazines, television, and radio were always available.

When I finally reached school age and the bus did stop, high drama and adventure made up most of my extracurricular reading. I would read and reread *Classics Illustrated* comics, and authors like Daniel Defoe, Mark Twain, Arthur Conan Doyle, Washington Irving, Edgar Rice Burroughs, and Frank W. Dixon. I also enjoyed *Superman* and *Batman* comic books and even went through a *MAD* magazine phase. Sometimes Mom had to chase me out of the house after school to play, because I would have rather just stayed in my room and read.

I wasn't much on writing until I was enrolled in a Catholic school, St. Bernard's. There, the nuns were stereotypically tough but thorough educators. In third grade, I labored long and hard with Sister Mary, and while it was her thoroughness that led to my discovering that I loved to write, it was a horse—the Diving Horse of Atlantic City—that sparked a lifetime passion for writing.

¹ Golden Books were known as Little Golden Books, a popular series of children's books that had gold-foil bindings.

At the beginning of that school year, Sister Mary had assigned to us the ubiquitous essay about summer vacation. That summer, my family had taken a day trip to the original Steel Pier in Atlantic City to see the famous Diving Horse. How my parents
30 learned of the horse, I don't know, but as a family that took all its vacations by automobile, no doubt they were alert for local-yet-unusual attractions. Atlantic City must have been appealing; in the 1960s, there were no casinos or nightlife per se—unless you count Frank Sinatra, Jr.—but the town was mostly known for its family-oriented amusements and the
35 tradition of Bert Parks crooning his welcome to Miss America. But for us, Bert paled in comparison to the Diving Horse. So off we went in the white '64 Pontiac to climb aboard carnival rides and eat hamburgers.

Thinking back on that day, I remember the windburn I got on my forearms from the cool salty breeze off the Atlantic—a first for me. And to this day, I can't go to the Jersey
40 Shore without bringing home a box of fresh saltwater taffy.

But above all, I remember anxiously getting bleacher seats to see the Diving Horse. As we took our seats, the horse, with a fellow named Arnette Webster² (clad in a rubber wet suit) on its back, was about to jump from a platform roughly 30 feet high into a pool. I recall staring at the odd sight of a horse standing as calmly as you please on a platform
45 above a pool just like the kind I swam in at my Aunt Anne and Uncle Leo's house. To a recorded drumroll and cymbal crash, Webster urged the horse forward, and the two fell through space to make the biggest splash I'd ever seen—even bigger than the cannonballs my uncle could make in his own pool! Wow! And then both horse and rider surfaced, though for the life of me, I can't recall how they got out of the pool.

50 So two months later, when Sister Mary gave us the essay assignment, it was easy . . . as easy as falling into a pool.

Looking at the Diving Horse essay some 40 years later, it's apparent how much I must have enjoyed writing about the experience. I put a lot of energy into trying to describe the windburn, the taffy, and the horse, which, to my eight-year-old eyes, must have been
55 suitable for a Valkyrie to ride. But in that essay, I did something that I imagine no other child in the class did: I ended my piece with a rhetorical question. I wrote, "How would you like to go to Atlantic City?"

Small as that detail was, Sister Mary must have noticed it. And she must have encouraged me to keep writing, because with that essay, I learned something about myself.
60 I learned that I loved to write.

It was at that age, as my father has confirmed, that I started to write stories, not just read them. I soon took to writing as I had taken to reading. I wrote about monsters,

² The author's recollection of the diver appears to be inaccurate. Arnette French, a woman who performed in horse diving shows, stopped performing in 1935.

superheroes, and what could pass for a fourth-grader's version of a mystery. Superman never had it so easy foiling the best-laid plans of Lex Luthor, and my detectives—not as
65 articulate as Sherlock Holmes, but as savvy—somehow always managed to catch the bad guys and still remember to say "Thank you."

Even now, when many of my workdays at Rutgers University are done, Rex Stout, Mark Twain, Arthur Conan Doyle, and Superman are still often at the center of my recreational reading. And when I write a mystery, whatever thread each of my various
70 detectives picks up and untangles, something inside reminds me of the chubby kid with the glasses urging the horse to "Jump! Jump!"

In terms of distance, it was about 30 feet. In terms of writing, it was a leap of a lifetime.

8

Read this sentence from lines 4 through 6.

In Garwood, New Jersey, a child picked up his favorite Golden Books and stood outside of his parents' apartment building, waiting for the school bus.

Which line or lines best explain the reason for the narrator's action in this sentence?

- A lines 6 through 8
- B line 10
- C lines 12 through 14
- D line 23

9

Which lines reveal a detail about a tradition of the narrator's family?

- A lines 30 through 32
- B lines 36 and 37
- C lines 39 and 40
- D lines 43 through 45

10

The details in lines 38 through 49 develop a theme of the passage by showing

- A how experiences can be more exciting than stories
- B that memories can be both powerful and detailed
- C that the past can feel more intense than the present
- D how spending time with family is important

11

Read lines 48 and 49.

Wow! And then both horse and rider surfaced, though for the life of me, I can't recall how they got out of the pool.

The purpose of these lines is most likely to

- A emphasize the narrator's amazement with the outcome
- B imply that the narrator has an imperfect memory
- C highlight the anxiety that the narrator experienced
- D show the seriousness of the situation

12

Read lines 50 and 51.

So two months later, when Sister Mary gave us the essay assignment, it was easy . . . as easy as falling into a pool.

These lines mean that the narrator

- A has a vivid memory of the previous summer's events
- B is comparing his achievement with that of the horse
- C is fondly remembering the horse's splash
- D has a strong feeling of excitement

13

What do lines 61 through 71 reveal about the narrator?

- A He currently writes books for children.
- B He is reminded of his childhood when he reads.
- C He imitates the style of the authors he admires.
- D He continues to have many of the same literary influences.

14

The author develops a theme of the passage mostly by describing

- A how he was different from other children in his class
- B the types of stories he wrote when he was younger
- C the books he liked to read when he was younger
- D how people and events inspired him to write

The First Public Park

by Marcia Amidon Lusted

It was just an idea for more than a decade, but by 1857, New Yorkers were serious about building a grand public park. New York was the largest metropolis in the nation, and its citizens wanted to show the world that Americans were not just concerned about industry, wealth, and materialism but that they also appreciated natural landscapes.

- 5 Using eminent domain, the city took more than 840 acres of land in the center of Manhattan for the new park. The area was considered to lack any real estate value—it included swamps, bluffs, and rock outcroppings as well as two reservoirs that supplied city water. It was home to about 1,600 poor residents, however. This population of pig farmers, gardeners, and an African American settlement called Seneca Village was displaced by the
- 10 park's construction.

The Central Park Commission held a competition to choose someone to design the park. Among the professional and amateur designers who entered the contest was a team consisting of an American agriculturalist and a British-born architect: Frederick Law Olmsted and Calvert Vaux.

- 15 It was Vaux's idea for the two men to join forces. A talented draftsman, Vaux used his detailed drawings to show how their idea for the park would look. An accomplished writer, Olmsted wrote the report that described their plan and included lists of proposed plants and an estimated budget. They submitted their plan, called "Greensward," a day after the commission's deadline.

- 20 Greensward included pastoral views and rolling meadows, just like those in traditional English parks. The plan offered beautiful vistas of green lawns and natural rocky ridges as well as more formal locations for public gatherings.

- It also included four roads that cut through the park to carry carriage traffic from one side to the other. Olmsted and Vaux designed these major thoroughfares to run eight feet
- 25 below the park's surface so they would not disrupt the park's views and rural feeling. Pedestrian paths, equestrian roads, and carriage drives were all kept separate from one another. Vaux designed more than 40 bridges so that these various paths would never have to cross on the same level.

- Unlike some of the other submissions that included grand, elaborate buildings,
- 30 Olmsted and Vaux kept structures to a minimum, with only four in the original plan. The design and materials for the buildings were also specifically selected to blend in with the natural environment.

Greensward was announced the winner in the spring of 1858. The selection committee debated over certain design points—some of the members wanted a wide grand avenue in the park, similar to those found in European parks. Olmsted argued against it by saying that stately roads would “destroy scenery at great cost” and that “straight lines of trees or stately architecture . . . belong not to parks for the people but to palatial gardens.” Olmsted and Vaux had created their design for the recreation of all people, not just the wealthy. The park was to be a place where all New Yorkers could enjoy nature. Its ultimate design would retain this feeling.

The construction of Central Park was one of the most massive public works projects to take place in 19th-century New York. It required about 20,000 workers to reshape the natural features of the land according to Olmsted and Vaux’s plan. Three hundred thousand cubic yards of rock were blasted into rubble, and the resulting stone was crushed to use as paving material. Nearly three million cubic yards of soil were moved, and more than 270,000 trees and shrubs were planted. Swamps were transformed into scenic lakes, and extensive drainage work was done to get rid of small streams and pools. By 1866, more than \$5 million had been spent on construction. The park’s final price tag was more than \$10 million. In the end, this entirely planned park, stretching from 59th Street to 110th Street and from Fifth to Eighth avenues, had a completely natural, unplanned feeling to it.

The process of overseeing the park’s construction and accounting for its expenditures exhausted Olmsted. He required a six-week rest cure in Europe in 1859 and suffered a severe broken leg in 1860 that laid him up, but he had the plans for the park spread out in his bedroom so he could continue to work. When he tried to resign from the project in 1861, however, the commission knew that it could not afford to lose him. Ultimately, Olmsted’s duties and responsibilities were decreased, and when he departed the project to serve in the U.S. Sanitary Commission during the Civil War (1861–1865), the park’s construction was completed under park commission president Andrew Green and Vaux.

Olmsted’s involvement in Central Park spanned nearly 20 years. It was not the only site he worked or consulted on, and, for a couple of years, other projects demanded his full attention. But from the time their plan was selected until the mid-1870s, Olmsted and Vaux were associated with the park on and off. Sometimes, their titles as landscape architect advisors required little on-site work. At other times, such as when Olmsted filled in as acting president of the Department of Public Parks, he looked into establishing lights in the park at night and assessing the park’s safety. By 1878, however, Olmsted’s role with the park officially ended.

Today, Central Park stands as one of Olmsted’s greatest legacies. It contains numerous playgrounds and athletic fields. Runners and bicyclists make use of the wide, rolling paths. There are places to skate in the winter and boat in the summer. Concerts, plays, and rallies take place there. Sculptures by famous artists can be found throughout the park. There are also quiet places to walk, sit and read a book, or watch birds. Central Park has become a

75 world-famous site that attracts more than 25 million visitors each year. It also is a shining example of Olmsted's desire to create and preserve public green spaces in urban places for generations of people to enjoy.

15 Which evidence supports the claim that Americans “appreciated natural landscapes” (line 4)?

- A** “The area was considered to lack any real estate value—it included swamps, bluffs, and rock outcroppings as well as two reservoirs that supplied city water.” (lines 6 through 8)
- B** “Vaux designed more than 40 bridges so that these various paths would never have to cross on the same level.” (lines 27 and 28)
- C** “The construction of Central Park was one of the most massive public works projects to take place in 19th-century New York.” (lines 41 and 42)
- D** “There are also quiet places to walk, sit and read a book, or watch birds.” (lines 71 and 72)

16 How does the information regarding the competition contribute to the reader’s understanding of Vaux and Olmsted?

- A** Vaux had different ideas from Olmsted regarding the appearance of the park.
- B** Vaux and Olmsted carefully considered suggestions made by the committee.
- C** Vaux and Olmsted’s collaboration benefited from their distinct abilities.
- D** Vaux was more concerned about details than Olmsted.

17 Which evidence supports the idea that Olmsted and Vaux wanted their park to appeal to all New Yorkers?

- A** They excluded some designs common to European parks.
- B** They decided to put the park in the middle of Manhattan.
- C** They hired thousands of local residents to build the park.
- D** They included lights so the park could be used at night.

18 Read this sentence from line 68 of the article.

Today, Central Park stands as one of Olmsted’s greatest legacies.

The author uses the word “legacies” in this sentence to mean

- A** accomplishments benefiting future users
- B** financial investments with the goal of benefiting everyone
- C** complicated models to copy and build
- D** old projects worthy of recognition

19

Read these sentences from lines 37 through 40 of the article.

Olmsted and Vaux had created their design for the recreation of all people, not just the wealthy. The park was to be a place where all New Yorkers could enjoy nature. Its ultimate design would retain this feeling.

Lines 37 through 40 relate to lines 68 through 72 by showing that the

- A role of the park has changed over time
- B park is now used throughout the year
- C park designers achieved their goal
- D size of the park is increasing

20

Which phrase from the article helps readers understand the meaning of “pastoral” (line 20)?

- A “grand public park” (line 2)
- B “formal locations” (line 22)
- C “rural feeling” (line 25)
- D “world-famous site” (line 73)

21

Based on evidence from the article, which claim is most accurate?

- A Olmsted and Vaux were hired based on their reputations.
- B The scale and design of the project made Central Park remarkable for its time.
- C Americans had a greater appreciation of nature than did Europeans.
- D Central Park today hosts a greater array of activities than it did in the past.

Directions

Read this story. Then answer questions 52 and 53.

The Pod

by Maureen Crane Wartski

Couldn't Pete talk about anything but *fish*?

Jesse Waring tried to block his cousin's voice, but there was no escape.

"Dolphins aren't fish, they're mammals," Pete was lecturing. "They look big and tough, but they can get stressed or scared, like the stranded dolphin we rescued . . ."

5 "Jesse?" His mother was standing beside him, her eyes full of concern. His parents were always worrying about him these days, Jesse thought, irritably, and the other relatives were just as bad. *Poor Jesse, it's a shame about the accident. He used to be a great athlete . . .* Even when they didn't talk to him, he could feel their pitying thoughts.

10 "Can you go to the store for me?" his mother was saying. "We've run out of milk. That is," she added quickly, "if you're not too tired . . ."

" . . . And I want to make sure to visit the Cape Cod Stranding Network," Pete was droning on. "They have a hotline, and they do great work. . ."

Yada, yada, yada. "Sure, Mom," Jesse said. *Anything to get away from Pete's lectures and all these pitying eyes.*

15 He snatched up car keys from the table in the entryway, grabbing his windbreaker as he limped out the door. Once outside, he wished he'd brought his parka—the wind had an icy sting—but he wasn't going back into the house.

20 He'd always enjoyed the annual Waring family reunion, when cousins, uncles and aunts from all over the country got together and rented a house on New England's Cape Cod, but this March was different. It was the first time the clan had gathered since the accident.

Jesse didn't want to think about how a man driving a pickup had jumped a red light, slamming into his car and fracturing his legs. Until then Jesse had been the star of the school soccer team, certain of an athletic scholarship.

25 "Not anymore," he muttered, then frowned as he realized he'd passed the store. Well, OK, there was a convenience store about 30 miles away, and the drive would give him some needed alone time.

At first, the silence was great.

30 But as Jesse drove on the road that wound beside the ocean, he kept thinking how his future had been smashed along with his legs. Pep talks that people gave him made it worse. He was a cripple, and he knew it. These days Jesse always felt as if there was a tight, hard knot in his chest.

35 On impulse, he turned the wheel, pulling into an empty parking lot that faced the water. He got out and limped down some stairs. Except for screeching seagulls and a few scattered rocks, the beach was deserted.

Suddenly, Jesse tensed. *That rock . . . did it move?* He took a step closer and saw that it was no rock.

40 The dolphin wasn't very big, not even four feet long. When Jesse hobbled over, the big fish . . . *mammal*, according to Pete . . . rolled an eye at him. How long had it been there? It was breathing, but its sides were heaving painfully.

Fragments of Pete's endless monologue came back to him. His cousin had said that a dolphin's rib structure wasn't built to protect it on land. The body weight of this creature was slowly compressing its vital organs, and if it didn't get back into the water soon, it could die.

45 It was going to low tide, and the waves seemed far away. The best thing to do was to call Pete, who would know what to do. Jesse reached for his cell phone.

It wasn't there. He'd left it in the pocket of his parka! He could drive home and get Pete, but that would mean leaving the dolphin. Would it be alive when he got back? He knew nothing about this creature except that it was helpless.

50 The dolphin's eye rolled again, and Jesse felt a sudden jolt of empathy.

It looked as scared as he had felt when they'd wheeled him into the emergency room that afternoon.

"Hey, Bud . . ." Jesse knelt down beside the dolphin. "OK, I can't just leave you to die. But how do I get you back into the water?"

55 Even if he managed to drag this creature that weighed—what? maybe 75 pounds? back to the water, the coarse sand might damage its skin. Jesse looked helplessly toward the gray ocean and was surprised to see dark shapes arcing out of the waves. A *pod*—Pete's word—of dolphins was out there.

60 "I think your family's waiting for you, Bud." Carefully, Jesse reached out and patted the dolphin. Was it his imagination that his touch made the dolphin calmer?

Jesse didn't waste time thinking about that. He was trying to remember what Pete had said about how, when he'd helped rescue a stranded dolphin, they had put the creature on a sort of blanket sling and carried that contraption down to the water. Well, he didn't have a blanket handy, so his windbreaker would have to do.

65 Carefully, Jesse scooped a hollow in the soft sand under the dolphin's head, then eased part of the windbreaker under it. He was streaming with sweat by the time he'd managed to maneuver as much of the dolphin as possible onto its makeshift "blanket," then began to drag the dolphin toward the water.

70 Twice, his legs buckled under him tumbling him backward onto the sand, but he kept going until water was lapping around his ankles.

"Almost there, Bud," Jesse gritted.

As Jesse waded knee-deep into the water, the dolphin made some kind of noise and then began to swim.

75 "Woo hoo!" Jesse yelled, then yelped in dismay. The dolphin was swimming back toward the shore.

What was wrong with the crazy creature? Pete's voice began to drone in Jesse's mind again, recounting his own dolphin rescue: "*The dolphin was disoriented. It kept heading for the shore. We had to guide it back into the deep water . . .*"

80 Jesse waded deeper, past the breakers. Icy waves broke against him as he tried to head off the young dolphin. When he'd finally managed that, it wouldn't turn. He wished he had paid more attention to Pete's lecture, but wishing never helped.

Waves sent freezing spumes into his face. "Bud, you've got to save yourself," Jesse gritted through chattering teeth. "Nobody's going to do it for you. If you give up, you're finished . . ."

85 Suddenly, as if it had at last understood, the young dolphin turned toward deeper water and began to swim toward the pod. Waiting dolphins arced nearer as if in welcome, and watching them, Jesse thought of his own family. They'd be worried because he'd been gone so long.

My pod, he thought.

90 He was freezing as he limped back to his car, but he was grinning, and he was happier than he'd been in a long while. He was going to drive to the nearest store and call Pete, who would probably contact that Cape Cod Stranding Network hotline that he'd been talking about. The CCSN would make sure Bud didn't strand again.

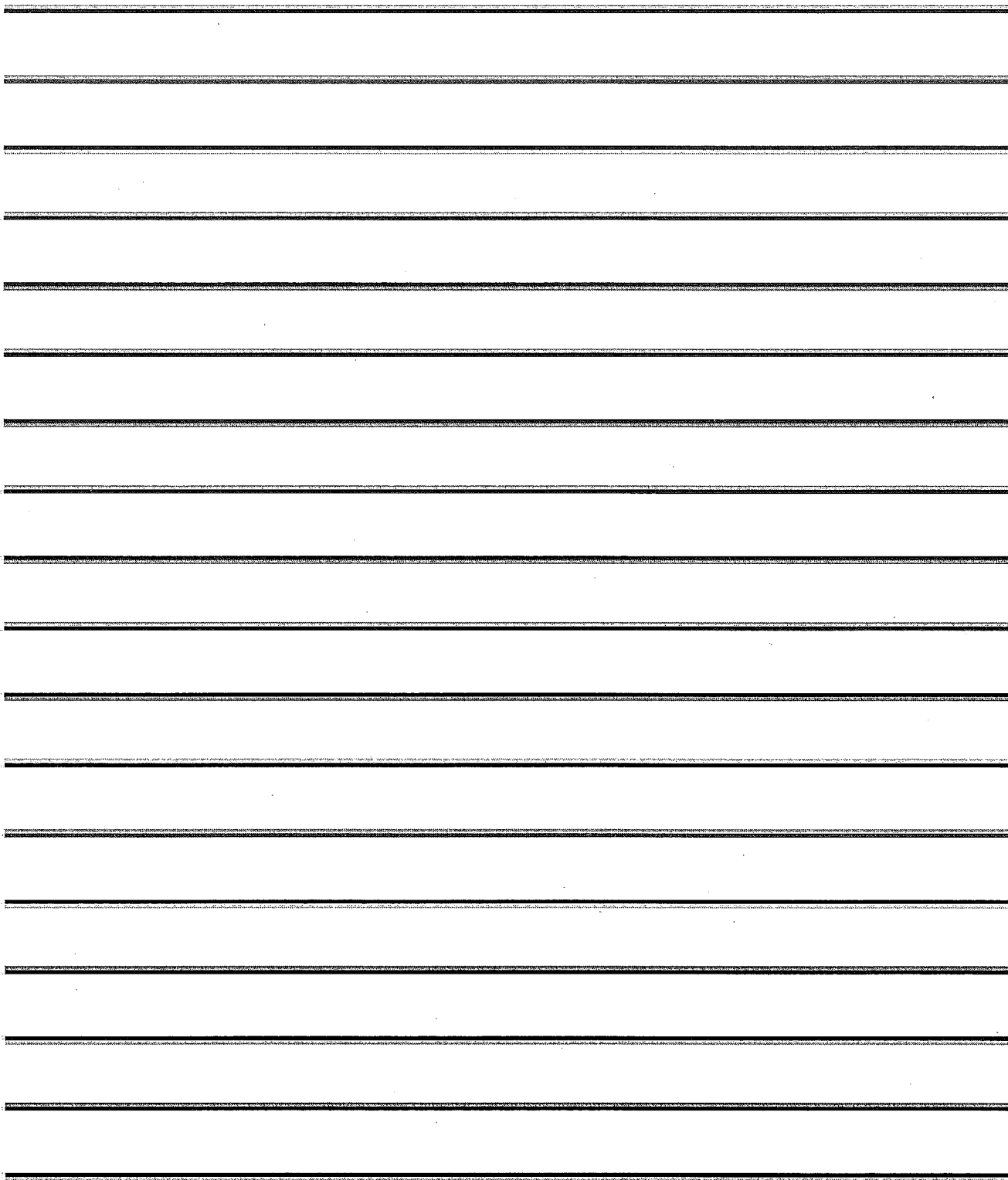
"But that's not going to happen anyway," Jesse said aloud.

95 He had a feeling that the young dolphin was finally on the right track.

52

How does Jesse feel about his family in lines 1 through 21? Use two details from the story to support your response.

- identify what the dolphin represents
- explain how the symbol of the dolphin helps the reader gain a deeper understanding of the central idea of the story
- use details from the story to support your response



Can a Playground Be Too Safe?

by John Tierney

When seesaws and tall slides and other perils were disappearing from New York's playgrounds, Henry Stern drew a line in the sandbox. As the city's parks commissioner in the 1990s, he issued an edict concerning the 10-foot-high jungle gym near his childhood home in northern Manhattan.

5. "I grew up on the monkey bars in Fort Tryon Park, and I never forgot how good it felt to get to the top of them," Mr. Stern said. "I didn't want to see that playground bowdlerized. I said that as long as I was parks commissioner, those monkey bars were going to stay."

- 10 His philosophy seemed reactionary at the time, but today it's shared by some researchers who question the value of safety-first playgrounds. Even if children do suffer fewer physical injuries—and the evidence for that is debatable—the critics say that these playgrounds may stunt emotional development, leaving children with anxieties and fears that are ultimately worse than a broken bone.

- 15 "Children need to encounter risks and overcome fears on the playground," said Ellen Sandseter, a professor of psychology at Queen Maud University in Norway. "I think monkey bars and tall slides are great. As playgrounds become more and more boring, these are some of the few features that still can give children thrilling experiences with heights and high speed."

- 20 After observing children on playgrounds in Norway, England and Australia, Dr. Sandseter identified six categories of risky play: exploring heights, experiencing high speed, handling dangerous tools, being near dangerous elements (like water or fire), rough-and-tumble play (like wrestling), and wandering alone away from adult supervision. The most common is climbing heights.

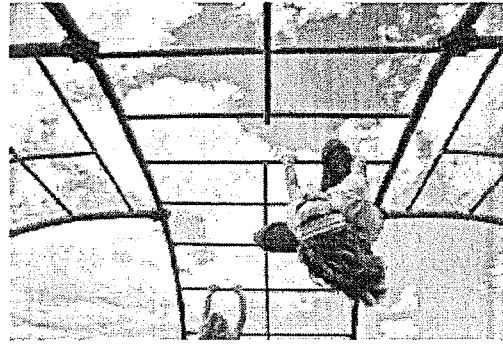
- 25 "Climbing equipment needs to be high enough, or else it will be too boring in the long run," Dr. Sandseter said. "Children approach thrills and risks in a progressive manner, and very few children would try to climb to the highest point for the first time they climb. The best thing is to let children encounter these challenges from an early age, and they will then progressively learn to master them through their play over the years."

- 30 Sometimes, of course, their mastery fails, and falls are the common form of playground injury. But these rarely cause permanent damage, either physically or emotionally. While some psychologists—and many parents—have worried that a child

- who suffered a bad fall would develop a fear of heights, studies have shown the opposite pattern: A child who's hurt in a fall before the age of 9 is less likely as a teenager to have a fear of heights.
- 35 By gradually exposing themselves to more and more dangers on the playground, children are using the same habituation techniques developed by therapists to help adults conquer phobias, according to Dr. Sandseter and a fellow psychologist, Leif Kennair, of the Norwegian University for Science and Technology.
- 40 "Paradoxically," the psychologists write, "we posit that our fear of children being harmed by mostly harmless injuries may result in more fearful children and increased levels of psychopathology."
- The old tall jungle gyms and slides disappeared from most American playgrounds across the country in recent decades because of parental concerns, federal guidelines, new safety standards set by manufacturers and—the most frequently cited factor—fear
- 45 of lawsuits.
- Shorter equipment with enclosed platforms was introduced, and the old pavement was replaced with rubber, wood chips or other materials designed for softer landings. These innovations undoubtedly prevented some injuries, but some experts question their overall value.
- 50 "There is no clear evidence that playground safety measures have lowered the average risk on playgrounds," said David Ball, a professor of risk management at Middlesex University in London. He noted that the risk of some injuries, like long fractures of the arm, actually increased after the introduction of softer surfaces on playgrounds in Britain and Australia.
- 55 "This sounds counterintuitive, but it shouldn't, because it is a common phenomenon," Dr. Ball said. "If children and parents believe they are in an environment which is safer than it actually is, they will take more risks. An argument against softer surfacing is that children think it is safe, but because they don't understand its properties, they overrate its performance."
- 60 Reducing the height of playground equipment may help toddlers, but it can produce unintended consequences among bigger children. "Older children are discouraged from taking healthy exercise on playgrounds because they have been designed with the safety of the very young in mind," Dr. Ball said. "Therefore, they may play in more dangerous places, or not at all."
- 65 Still, sometimes there's nothing quite like being 10 feet off the ground, as a new generation was discovering the other afternoon at Fort Tryon Park. A soft rubber surface carpeted the pavement, but the jungle gym of Mr. Stern's youth was still there. It was the prime destination for many children, including those who'd never seen one before, like Nayelis Serrano, a 10-year-old from the South Bronx who was visiting her cousin.

70 When she got halfway up, at the third level of bars, she paused, as if that was high enough. Then, after a consultation with her mother, she continued to the top, the fifth level, and descended to recount her triumph.

"I was scared at first," she explained.
75 "But my mother said if you don't try, you'll never know if you could do it. So I took a chance and kept going. At the top I felt very proud." As she headed back for another climb, her mother, Orkidia Rojas, looked on
80 from a bench and considered the pros and cons of this unfamiliar equipment.



"It's fun," she said. "I'd like to see it in our playground. Why not? It's kind of dangerous, I know, but if you just think about danger you're never going to get ahead in life."

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Directions

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Read this article. Then answer questions 58 and 59.

Tear Down the Swing Sets

And the plastic forts. Here's how to put the *play* back in playgrounds.

by Nicholas Day

In 1888, the psychologist Stanley Hall published a story about a sand pile. A minor classic, it describes how a group of children created a world out of a single load of sand. These children were diligent, they were imaginative, they were remarkably adult.

5 More than a century later, at the architect David Rockwell's Imagination Playground in lower Manhattan, small humans scurry back and forth all day long, carrying Rockwell's oversized blue foam blocks from self-devised task to self-devised task. These children are intent, they are cooperative, they are resourceful. The scene resembles nothing so much as Stanley Hall's sand pile—with each grain of sand much bigger and much bluer. (Except for the bits of actual sand, that is.)

10 More than any playground in recent memory, the Imagination Playground has inspired an outburst of excitement. It's a hit with the hip parents who take their kids to Dan Zanes concerts, and is just as crowded as one. But it also represents something much more mundane: the triumph of loose parts. After a century of creating playgrounds for children, of drilling swing sets and plastic forts into the ground, we have come back to
15 children creating their own playgrounds. Loose parts—sand, water, blocks—are having a moment.



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The resurgence of loose parts is an attempt to put the *play* back in playgrounds. The late 1960s and early 1970s were a time of exuberant playground design, culminating in the great Richard Dattner adventure playgrounds in New York City. Then the grownups got skittish. Down came the merry-go-rounds and the jungle gyms, and in their place, a landscape of legally-insulated, brightly-colored, spongy-floored, hard-plastic structures took

root. Today, walking onto a children's playground is like exiting the interstate: Regardless of where you are, you see the exact same thing.

30 A lot of people agree that playgrounds are now too boring, and for years there's been talk about how we should make them more challenging, more risky. But so far, that talk

hasn't turned into more interesting playgrounds. The most adventurous playgrounds tend to be singular projects, often built through fundraising, for the rich. "People talk about making playgrounds more risky," says Susan Solomon, the author of *American*
35 *Playgrounds*, which charts their demise. "But there's this sense that if you talk about it, that's enough. There's this very real reluctance to get involved in anything that might at least *potentially* cause an injury."

In Europe, the assumptions are radically different. Even the head of play safety at England's Royal Society for the Prevention of Accidents—a man whom you'd assume
40 would be paranoid about preventing *all* accidents—has said that "children should be exposed to a certain degree of risk, not because an activity is risky per se but because it is fun, exciting, and challenging."

As the psychologist Ellen Sandseter has pointed out, the American attitude is a fundamental miscalculation of the risks: Kids who are bored stay inside and staying inside
45 is ultimately far *worse* for your health than a broken arm. Talk about why we can't have nice playgrounds here typically begins and ends with lawsuits. But potential legal action is too easy an excuse for not rethinking playgrounds, says Darell Hammond, head of the play-promoting nonprofit KaBOOM!. Change "requires all of us doing something different, not just a few law changes." In short, it requires all of us to be a little less
50 panicked, and honestly, that's probably too much to ask, at least in the short term. Which is why loose parts may be the best hope for the future of playgrounds right now.

Rockwell's playground is still an adventure playground—a construction site with all the splintery edges sanded down. It's what an adventure playground looks like in a risk-averse culture. And it promotes the kind of play we think children should be doing now: not
55 with just their bodies, but with their minds. The Imagination Playground is a much more cognitive vision of the playground. No one would confuse it with a jungle gym.

Rockwell himself is well-aware of this. At the adventure playgrounds of decades past, he says, "they did things much more dangerous than you could get away with today in a litigious society—working with hammers and nails and *actually* building things." (These
60 types of playgrounds do still exist in the United States, but barely.) So instead of physical risk, Rockwell talks about *creative* risk. At the Imagination Playground, you can dare to build whatever you want—knowing that tomorrow it will be gone. "Part of the impact of the playground is that it is impermanent," he says.

The rise of the loose parts playground extends well beyond lower Manhattan. In
65 various versions, there are more than 1,000 sets of Rockwell's blocks out there, and thanks in part to a partnership with KaBOOM!, a lot of those blocks are far from the tax brackets of the South Street Seaport. When I talked to KaBOOM!'s Hammond, he'd just come back from Miami, where the bright-blue blocks are in a low-income child care center.

Of course, loose parts don't have to be designed by David Rockwell—they can be junk
70 from your basement. Detroit's Arts & Scraps is a loose parts-focused organization where

the loose parts are, well, *scraps*. Early childhood educators, for their part, adore loose parts for the open-ended, spontaneous sort of play they encourage, which is very much in line with the new orthodoxy of how young children learn. "When you have loose parts, you don't have the same repetitive pattern of play," Hammond says. "It's much a more
75 circuitous path." And that's what you want from play. "You want to see kids escape into this zone in which they lose themselves." In other words, loose parts are perfectly suited to assuage the paradoxical parental anxieties of the moment: We want our children to have time to play but we also want that play to be *productive*—to be more than play.

And in the end, the blocks might not even be the most important loose parts. "Kids
80 are drawn to sand and water," Barthold¹ says. "Beyond the blocks, the basics are simply sand and water."

Stanley Hall's sand pile, it turns out, isn't a portrait of the past. It's a vision of the future.

¹ Nancy Barthold is assistant commissioner for recreation and programming for New York City's Parks Department.

58

Why does the author of "Tear Down the Swing Sets" believe that loose parts make a superior playground? Use two details from the article to support your response.

In your response, be sure to

- explain what led to changes in playground design
- explain what research has shown about these changes
- use details from both articles to support your response

