

**Excerpts from *The First Human:
The Race to Discover Our Earliest Ancestors***

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EXCERPT FROM CHAPTER SIXTEEN, BONES OF CONTENTION

Arrange whatever pieces come your way. --Virginia Woolf

The French Academy of Sciences has been the scene of many passionate, even dangerous, debates since its formation in a Jesuit monk's cell in 1666. The founding members met to discuss the radical ideas of Galileo and Descartes. A century later, in 1793, during the Reign of Terror, the elitist academy was deemed undemocratic and abolished; the renowned chemist Antoine Lavoisier was beheaded for his prominent role. But the academy reconvened two years later and moved into its present home in the magnificent baroque palace of the Institute of France on the Left Bank of the Seine River. The academicians were still perceived as a political threat, with Napoleon complaining about the "salon politics of liberal intellectuals." He appointed himself president of the institute in 1801, the better to reform the academies to his liking. The Academy of Sciences survived, and by the late nineteenth century, the fraternity of male scholars would move to protect itself from a new type of threat: it would vote to reject Marie Curie for membership in 1911, only months before she won her second Nobel Prize. Even the shroud of Turin was brought here—with scientists arguing intensely for two days over whether it was legitimate and worthy of study.

It was thus a perfect setting for staging a passionate debate among three scientists whose fossils were the trio of leading contenders for the status of the oldest known hominid. On a gray and drizzly Monday in September 2004, Michel Brunet, Brigitte Senut, and Tim White met for a rare face-to-face debate, along with French paleoanthropologist Yves Coppens, a member of the academy. Word of this unprecedented lineup had spread widely, and paleontologists, archaeologists, and anthropologists from all over Europe jammed into the opulent Grande Salle des Séances, where the speakers were poised to channel humanity's most ancient ancestors.

Translators took their places in a soundproof glass booth and headsets were passed out to members of the academy, so they could listen to the panel discuss the topic of "The First Hominids" in English or French. Television crews stood by, and the heat of their lights made the dark, wood-paneled room even more sweltering, with the windows closed and the draperies drawn for PowerPoint presentations. As Brunet, Senut, and White took their places in turn on the raised dais to speak, the camera lights illuminated the portraits and marble busts of the author Voltaire, the philosopher Jean-Jacques Rousseau, the mathematician Pierre de Fermat, and the physicist Charles-Augustin de Coulomb. Perhaps even more telling, one gilt frame was empty, a reminder to the French scientists that one among them might eventually have his or her visage framed there as well.

The first one to speak was Michel Brunet. Dressed in a navy jacket, striped shirt, and tie, with his straight gray hair brushed back, he was ready for serious business. He quickly dispensed with niceties to get right to the “bone of the matter,” in his words. He held up a fossil jaw and said, “Last month, this jaw became part of history.” The bone in his hand was a partial lower jaw of Toumaï’s species, *Sahelanthropus tchadensis*. It had been the subject of an article in a recent issue of the *South African Journal of Science*. In that article, the French geographer Alain Beauvilain, who had been part of the team that found the jaw, charged that Brunet’s team had glued an isolated molar—a wisdom tooth—on the wrong side of a lower jaw. Beauvilain and a French orthodontist who was his coauthor, Yves Le Guellec, said the isolated molar was glued on the right side instead of the left side of the jaw, where they thought it belonged. It was a curious report; neither one was a paleontologist or an anatomist familiar with fossil teeth, and their criticism did not alter the fossils’ status as a new type of human ancestor in any way. But it cast a cloud over Brunet’s methods, suggesting that his team was sloppy with their fossil analysis and inventory methods. The spectacle of scientists fighting tooth and nail over a wisdom tooth was widely reported in the French media.

Brunet brought up the report at the beginning of his talk at the academy, complaining that he had first learned of the article when he was visiting White in Berkeley, after it was published. The journal had not given him a chance to respond before publication, so he would do so at the meeting. He held up the jaw and explained that the wisdom tooth was found ten centimeters beside it, it was cleaned, and it was glued in where he said there was an “unambiguous match” between the molar and roots on the right side of the jawbone, which was evident on CT scans of the jaw. After he took a hard look at Senut, he said that a certain paleontologist who had not seen the jawbone had been quoted in the French press as saying he thought the tooth was glued on the wrong side. “I have to admit, I wonder what his intentions are,” Brunet said. Then he mentioned that this still unnamed paleontologist—assumed to be Senut’s partner, Martin Pickford—was one of the codiscoverers of *Orrorin*. Pickford, in fact, had translated Beauvilain’s article into English for the journal. Brunet’s intent was clear: he believed that Pickford was waging a campaign against *Sahelanthropus* as a hominid and against Brunet’s ability to analyze the fossils, because it threatened *Orrorin*’s status as the earliest member of the human family (a charge that Pickford said is “absurd”). Brunet then went over the traits that made Toumaï a hominid and said, “Until proven otherwise, *Sahelanthropus tchadensis* is the oldest known hominid.”

Pickford, who was traveling and could not attend the meeting, would say later that the editor of the journal had asked him to translate the article, not Beauvilain. He at first wrote a letter of apology to Brunet that he sent to the South African journal, but he rescinded it after Beauvilain and Le Guellec refused the apology. Then, twenty-seven researchers signed a letter in support of Brunet, saying that the molar had been put in the right spot. Pilbeam, who was a coauthor with Brunet on the report on Toumaï, said he was stunned that the journal would print Beauvilain’s article because “any competent morphologist seeing the originals or casts, along with the CT scans, would immediately recognize that the molar is from the right side.” But Pickford and Beauvilain criticized the letter as a tactic to intimidate and stifle debate on published fossils, and Beauvilain wrote a new letter to the journal with more criticism of Brunet’s methods.

Senut, who looked uncomfortable during Brunet's comments, did not respond. She looked particularly unhappy when a member of the audience who'd been one of the twenty-seven to sign the letter in support of Brunet—human paleontologist Marie-Antoinette de Lumley of the National Museum of Natural History in Paris—spoke up after the panel discussion to defend Brunet. She said, "It is obvious that Brunet was correct—this is a right-sided molar that corresponded to the right-sided jaw." De Lumley then scolded those behind the journal report for taking such a negative approach; if a mistake had been made, she said, there were better ways to handle it than exposing it in the media.

Senut was up next, but with evident self-restraint she stuck to the scientific topic at hand—namely, the evidence for *Orrorin*'s status as upright-walking member of the human family that still lived in the trees. Dressed in a simple gray skirt and floral blouse, she chose her words carefully. At the end, however, she lobbed a shot at White. "I hope that Tim White will tell us about *Ardipithecus ramidus*," she said, reminding everyone that they had been waiting a decade for details on the unpublished skeleton.

White took the microphone—and the challenge. Dressed neatly in a tan jacket, tie, and slacks, he also had some unfinished business of his own to attend to. After a quick overview on how to analyze a thighbone to tell if its owner walked upright like a human or in some other way, he got to Pickford and Senut's research. He began to slice and dice the CT scans of the thighbone of *Orrorin* that Senut had just shown, pointing out that they had been published twice—and that their poor resolution did not improve with the second publication, even if it was in the reputable journal *Science*. He agreed that the external features showed that *Orrorin* could walk upright, but he said the central question in a hominid this old was, How did it walk upright? Did it walk upright like a human, as Senut and Pickford claimed, or like an australo-pithecine—or in some novel manner?

He reminded the audience that Pickford and Senut had proposed that *Orrorin* walked upright with a more modern gait than Lucy's species and other australopithecines, therefore bumping them off the direct line to humans. But he complained that Pickford and Senut still had not presented the obvious evidence to support that claim—in the form of photos, X-rays, or reliable CT scans that showed the distribution of bone density inside the neck of the thighbone. He was intent on getting the inside story on *Orrorin*'s thighbone, because there was no other thighbone this old—not for *Sahelanthropus* or for *Ardipithecus*, he said. After White made this point, he stopped his presentation to ask Senut directly if the thighbone had been cracked or broken through the neck when they found it.

She answered, "It was broken."

White then posed a series of questions: Why didn't they measure the distribution of bone thickness directly before they glued it together? Why didn't they provide a photo? Why take CT scans when they could have a direct photo, which would be better?

Clearly put on the defensive, Senut shook her head from side to side and said that she had measured the thickness of the bone and that the distribution fit with what she expected in a human thighbone. Later, Pickford added that it was difficult to photograph the inside of the broken bone to provide conclusive evidence because of the zigzag pattern of the break.

White retorted that without reliable data, their hypothesis that *Orrorin* walked like a modern human was extraordinary. “There’s a creationist position here—*une position créationniste!*”

Senut protested indignantly: “I am not a creationist! Otherwise I would not study evolution for so many years!”

In the middle of the heated exchange, Senut reminded him of her question about the status of *Ardipithecus ramidus*. White responded by showing images of the crushed skull (the first time he had done so for anyone outside of his team), commenting that this was the “most fragile skeleton ever found.” In a humorous moment that deflated some of the tension in the room, he defined the term “roadkill” for the French audience.

He showed a computer movie composed of micro-CT scans taken of the skull. The CT scans were startling: the top of the vault of the skull had been crushed to within an inch of the base of the skull, forming a one-inch-thick slab of hundreds of small pieces. It revealed the tremendous task he faced to reconstruct it—a task that involved micro-CT scans of each piece, which White and his colleagues were using to help reconstruct the skull and see its internal structure. He said, “I’m sorry it’s taken us so long to analyze this fossil, but I think you want the right answer instead of the quick answer.”

Finally, as tempers flared in the sweltering room, the French science journalist Sophie Coisne of *Science et Vie* stood up at the microphone during the question-and-answer session and asked the panel, “Why do you scientists always argue about your fossils? Why don’t you share the fossils?” White was the first to respond, saying indignantly, “I take personal offense at that comment.” Then he explained that there was a process in science called peer review. Brunet’s paper in *Nature* describing the fossils of *Sahelanthropus* as a hominid had been subjected to six reviews by anonymous scholars before publication, which was intense scrutiny of a manuscript. For Beauvilain, with a translation by Pickford, to “recklessly” accuse Brunet of placing the molar in the wrong side was irresponsible. Yet Pickford and Senut would not provide their peers with a reliable image of the interior of the thighbone. At that point, he gestured to the portraits and busts of famous French scholars on the walls and said, “Even these gentlemen on the walls understand the peer-review process. This is not about science. This is about theater. This is theater!”

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