

Chapter 1

Strange companions for the last journey

The trilobite cave

Like any self-respecting journey, ours begins with a question. When did humans first rummage through stones and start collecting fossils?

To find an answer, we must pay a visit to a rural location in the hills of north-central France, in Burgundy. Along the road from the Morvan Regional Nature Park to the city of Auxerre lies a small village called Arcy-sur-Cure. The hamlet (just a few hundred square meters in all) lies nestled on the banks of the Cure River, which flows slowly as it enters a forest dotted with rocky spurs.

And it is here, in the late Nineteenth century, that our story begins, whose protagonist is a military doctor stationed in Paris named Adrien-Jacques-François Ficatier. He was also an amateur archaeologist, and during the penultimate decade of the century he spent several summers searching for artifacts around the Yonne region. On a July morning in 1886, Ficatier was wandering through the bush near Arcy-sur-Cure, which had long been known for a number of caves containing bones and flints. Suddenly, the doctor came upon a scree covered with underbrush vegetation at the end of a small depression that opened between the rock walls.

Ficatier caught a glimpse of what appeared to be just the entrance to a cave, chock-full of debris, including flints and animal bones. Without a second thought, he entered.

His enthusiasm soon turned to excitement when he realized that the cave was anything but as short as it might have seemed: in the course of exploration, the Frenchman found himself walking nearly 60 meters in total darkness, helped only by his flashlight. His instincts as an amateur archaeologist were suggesting that the cave was “promising”; it was the right place to look around for prehistoric artifacts. Before long, within a thick layer of earth, he found some traces left by prehistoric humans thousands and thousands of years before. This was enough for Ficatier to convince the Société des Sciences Historiques et Naturelles of Yonne, of which he was a member, to be allocated the necessary funds to undertake a proper excavation. He then hired a local innkeeper, Mr. Darret, and together they began to inspect the ground inside the cave inch by inch.

What the two men found after only a few days of work left them stunned: at their feet were bones of horses and reindeer, along with hundreds of fragments of worked flintⁱ, a variety of needles, several spears, and a few ornamental objects, pierced from side to side and probably used as pendants. Among them, the amateur archaeologist recognized a wolf’s tooth, some large scallops, a few other smaller sea shells, and a beautiful beetle carved from pine wood. Then the two stumbled upon one more object, unlike any other. It was small, just over four centimeters in size, elongated in shape, also perforated and, even stranger, seemed to feature strange segmentations. Ficatier examined it more closely and was stunned to realize that the unusual little object he held in his hands was a trilobiteⁱⁱ.

What on earth was a trilobite, an organism that lived on the seafloor 400 million years earlier, doing in a hillside cave inhabited by early humans? There is only one possible explanation: Ficatier had just discovered the oldest use of a fossil made by a human being. Even more surprising fact, the nearest geological formations that return trilobite remains are no less than a hundred kilometers away.

It was long believed that the trilobite came from the Armorican Massif, a mountain range in western France about 600 kilometers from Arcy-sur-Cure. In the last century, however, a famous professor of paleontology at the École des Mines, Henri Douvillé, proclaimed that it belonged instead to the species *Dalmanites hamlei*, exclusive to Bohemia. Recently, this interpretation has been questioned by numerous scientists, but all agree that the Arcy trilobite was not a local fossil.

Ficatier had not only come across one of the oldest records of human use of fossils, but had unearthed evidence of trade dating back 14,000 years, to the height of the Paleolithic period. Evidently, humans of that era were not only interested in hunting, but also engaged in the production and use of personal ornaments. The small trilobite must have meant something to them, since it had been the subject of a long distance trade. What the real significance of this fossil was, however, we cannot know. A clue may come from another amulet found by Ficatier, the scarab carved in lignite. Like the trilobite, also this one had two holes drilled in its sides, probably to be used in a necklace. Maybe the ancient inhabitants of the Arcy area noticed similarities between the trilobite and the insectⁱⁱⁱ? Unfortunately, this is only conjecture here, and as far as we know, the trilobite and the beetle were simply two objects reputed to be of some value and beauty by the Paleolithic Burgundians.

The Trilobite Cave^{iv}, as it was called by Ficatier himself, was later thoroughly surveyed by a singular personage, Abbot Alexandre Parat, a French ecclesiastic who remained famous for his archaeological and historical work in the Yonne^v. Parat was the first to apply a scientific method to study the topsoil accumulated at the bottom of caves, and was able to establish that the caves had been inhabited on several occasions and over a very long period of time.

In the course of his explorations, the abbot discovered several other caves in the vicinity of Ficatier's. In one of these, *Hyena Cave*, a whole collection of unusual minerals and fossils, including corals and shells, was later found. Analyses regarding the dating of the finds determined their age to be about 40,000 years, more than double that of the amulets in the trilobite cave.

Only later was it ascertained that the owners of these bizarre objects were not *Homo sapiens*. For tens of thousands of years, long before our distant ancestors migrated from Africa and then settled in Europe, the Old Continent had been home to another species of hominids, who wandered around hunting and occasionally happened to collect fossils. This very famous and much criticized species is known today as Neanderthals.

Neanderthal' sense of art

For a long time, our distant "cousins" were represented with ape-like features and postures and considered the least clever of the family, to put it mildly. Stocky, short, with receding chins, small foreheads, and those protruding eyebrows that gave them a perpetually wrinkled expression. A physical appearance that did not conform to our aesthetic standards, and did not help in the creation of our conceptual map regarding the ancient inhabitants of the Ice Age.

Neanderthals' fossils were the first human species to be discovered^{vi}, but their recognition met from the beginning with strong resistance from a culture, our own, that struggled to accept the existence of another human being other than *Homo sapiens*. Beginning with the first findings in 1829, the remains that we now know to belong to the Neanderthals were attributed, albeit with different interpretations, to the human species.

There were even those who determined that the mysterious skeleton found in

1856 in the Neander Valley was none other than that of a Cossack horseman with a deformed body, who had wandered the region during the turmoil of the wars of liberation from Napoleon in the years 1813- 1814: that is precisely what did an ophthalmologist from Bonn with the high-sounding name of August Franz Josef Karl Mayer, a fervent Christian and proponent of the idea of divine creation in its most traditionalist form.

For Hermann Schaaffhausen, a professor of anatomy at the University of Bonn and one of the very few scientists at the time who believed that species were not immutable^{vii}, that skeleton belonged instead to a member of a now vanished savage and barbaric race that lived in Europe before the arrival of modern humans. Of a different opinion was the German scholar Rudolf Virchow, at the time considered the star of the biological sciences, and still recognized as one of the fathers of modern cell biology. A staunch supporter of socialist ideals, he could not conceive of the existence of a primitive man, of an “origin” inferior to modern humanity, and so concluded that those remains must have belonged to a “trivial” specimen of *Homo sapiens* affected by some deformity, perhaps rickets (and it mattered little that the bones found in the cave were indeed robust, the exact opposite of what one would expect to find in a rickety individual). It was not until 1887, when zoologist Julien Fraipont and geologist Max Lohest described two skeletons found in Belgium the previous year, that *Homo neanderthalensis* was considered an extinct human species by all specialists of the time. Discoveries of Neanderthal men fossils continued throughout the next century. The numerous finds (including those in Italy at Saccopastore and Circeo) helped to reconstruct piece by piece the physical image of our distant cousins, but also to reinforce the iconography of the typical “primitive” with ape-like features, not too intelligent and almost incapable of complex reasoning (much less abstract thought). Unfortunately, these depictions still peep out in some too old-fashioned schoolbooks.

In recent decades, however, there has been a proliferation of studies reevaluating the figure of this human species. Returning, for example, to Arcy-sur-Cure, the Reindeer Cave has yielded fossils of Neanderthals and a large number of ornaments, decorated bone tools and dyes dating back at least 40,000 years. The discoveries have stunned paleoanthropologists, who are generally not inclined to accept that even Neanderthals were capable of producing something not only useful but also beautiful.

Many doubters, therefore, advanced the hypothesis that the objects were actually the work of Cro-Magnons, or the more “evolved” *Homo sapiens*, whose remains are found in the strata immediately above^{viii}. The issue, however, was solved in 2011, when a study clarified that the cave artifacts were actually made by *Homo neanderthalensis*.

In the province of Verona, in the cave of Fumane, numerous remains of birds of prey associated with Neanderthal fossils were found. The wing bones of the birds showed signs of cutting and scraping, as if the large remigant feathers had been intentionally detached. It is very unlikely that our distant cousins would have tried to eat the little meat on an eagle’s appendages. Almost certainly, then, the ancient inhabitants of the area used those long feathers to adorn themselves, perhaps in much the same way as the “classic” Native American way popularized by hundreds of Western movies.

The discoveries do not end there. In 2018 alone, for example, two very interesting scientific papers came out. In the first one, a team of researchers has analyzed some cave paintings from various Spanish sites dating back nearly 65,000 years ago (about 20,000 years before arrival of *Sapiens* in that part of Europe). The art found in these caves includes some reddish and some blackish paintings, in which a large

number of animals, linear markings, geometric shapes and handprints appear.

The second article, even more surprising, describes the of sea shells found in the Cueva de los Aviones (also in Spain), dating back as far as 120,000 years. The special feature of these mollusks is that they were painted with ochre and pierced, evidently to make necklaces. Yellow and red dyes have been found at the same site, as well as shells that still retain residues of complex pigment mixtures inside them. Neanderthal was a true artist; who would have thought?

This brings us back to the earliest fossil gatherers. We have already mentioned the Neanderthal finds at Arcy-sur-Cure, with their coral and mollusc remains found by Abbot Parat and dating back some 40,000 years, but the attraction to fossils by prehistoric peoples is even more ancient. At one location in the German state of Saxony-Anhalt, an archaeological site dated to about 90,000 years ago, various fossils of corals, shells, and shark teeth have been found, associated with flint artifacts typical of Neanderthals.

Recent discoveries that occurred in the Prado Vargas cave in northern Spain have broadened this view: a 2024 student showed that at least 15 marine fossils, mainly mollusk shells and sea urchins, had been collected by Neanderthals without these “objects” having any obvious practical use. It is likely that the fossils had some artistic value or, at the very least, stimulated these ancient humans’ curiosity about natural forms^{ix}.

To identify the earliest humans who had the remains of extinct organisms in their hands, however, we must go back more than 100,000 years. At that time, the earliest Europeans roamed the continent hunting with a multipurpose tool that we might call the Swiss army knife of the time: the *biface*. These flints, worked until they have a vaguely pointed, sharp shape on two sides, were all the technological baggage of Neanderthals. One such stone, found in the West Tofts area (Norfolk, England), bears the imprint of a bivalve mollusk of the species *Spondylus spinosus* dating from the Upper Cretaceous, that is, the end of the dinosaur era. The tool was carved in such a way that the shell was placed exactly in the center. The precise position of the fossil is one of the earliest evidences of humanity’s aesthetic sense. Another biface, also found in England, but this time in Kent, in an area known as Swanscombe (i.e., “valley of the swans”), bears a sea urchin fossil in the central area, where its five segments are clearly evident. Numerous coral tools have also been found at the same site, but the nearest coral outcrops are about 200 kilometers away. It is possible that these corals arrived at Swanscombe through trade between the various human groups that populated England at that time.

It is not even clear whether the maker of these artifacts was actually Neanderthal. It is equally possible, in fact, that the ancient British fossil collectors belonged to another human species, of even earlier origin, perhaps predating both Neanderthals and *sapiens*: *Homo heidelbergensis*, which most current paleontologists believe to be the common ancestor of both species. In fact, a human skull later to become known as *Swanscombe man*^x was also found at *Swanscombe*, which shows features intermediate between latter species and true Neanderthals.

Whatever the nature of these ancient fossil collectors was, one thing is certain: the curiosity of human beings toward these strange objects is something that has been going on for a long, long time.

Sea urchins and the immortality of the soul

Although they were active fossil collectors, Paleolithic men probably had no idea

what those strange objects were, although it is possible that they tried to give themselves some answers. Whatever the truth was, the road was now taken: man had set his sights on fossils and found that for some reason he could no longer do without them.

Sometimes the petrified remains of animals and plants accompanied their owner even after death: such was the case a bizarre find in 1887 in southern England's Dunstable Downs. On a cold March day, Worthington Smith, a local antiquarian with a penchant for archaeology, made one of his most impressive discoveries: on the top of a wind-swept hill, Smith identified a shallow grave in which lay the skeletons of a woman and a child, still clutched in a maternal embrace after 4,000 years. There was something very strange about that burial: mother and child were not alone. Mixed in with the fragile bones were hundreds of stone spheres, each adorned with a star-shaped carving. Smith's experienced eye immediately recognized the nature of those structures: they were sea urchin fossils^{xi}.

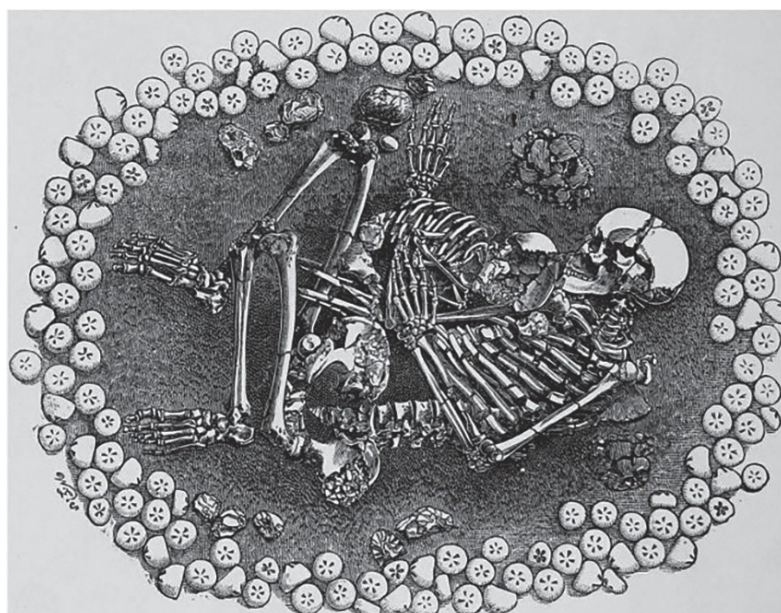


Figure 1. Engraving by Worthington Smith depicting the burial he discovered in the Dunstable Downs. The location and quantity of the urchins are entirely speculative.

At this point our hero performed an action that, at the time, was common among Nineteenth-century archaeologists but would bring modern scholars to despair: he collected all the material without marking the location of individual finds, effectively precluding any subsequent search within the site. Not satisfied with having accomplished the “misdeed,” Smith thought better of rearranging the entire burial using a touch of imagination: with a certain flair for theatricality, our amateur archaeologist arranged the urchins in a circle all around the skeletons of the mother and child. Smith's findings were later reassembled and displayed to the public at the entrance of a local school. The cherry on top of the whole affair is the fact that the students of the aforementioned institution, evidently enthusiastic about the “upgrading” of their atrium, in the years to come added numerous other urchin fossils from the surrounding areas to the shrine, making it completely impossible to trace the actual

original number of echinoderms in the tomb.

Leaving aside issues concerning the damage and subsequent “showmanship” of the site found by Smith, one question arises: among all the goods that could be taken to the afterlife, how come such unusual objects had been chosen?

In fact, as Kenneth J. McNamara points out in his extraordinary survey *The Star-Crossed Stone*, fossil urchins have been the subject of an unusually intense tradition by human beings, beginning at least 10,000 years ago and widespread. We have already seen in the previous section that humans had begun collecting and employing fossil sea urchins in really ancient times – Heidelberg man Neanderthal man used them to adorn their flint bifaces.

It was with *Homo sapiens*, however, that the use of petrified echinoderms really became massive. In one of the oldest Neolithic sites in the world, Ain Ghazal in Jordan (dating back nearly 11,000 years), a large number of fossilized urchins have been found, and each had a hole in the center so that it could be hung as a pendant. Probably these necklaces from the “five- pointed cross” had a special meaning and were perhaps intended as protective objects.

In contrast to the asparagus of the campanilian short story^{xii}, evidently sea urchins really had a relationship with the immortality of the soul, at least according to these findings. What is curious is that fossil sea urchins have been associated with burials and the dead for a very long period of human history, which is by no means limited to prehistory. In a Suffolk locality known as Bury St. Edmunds, a tomb was found dating from the Anglo-Saxon invasion of Britain (5th century CE), and containing the remains of a woman clutching a petrified sea urchin in her hands. A similar find occurred near Cambridge, where another woman from the same era was buried with a leather bag around her neck. The contents? A fossilized sea urchin, of course.

Of all the “echinoderm burials,” however, one of the most surprising ones discovered so far is the one in Heliopolis, Egypt. In a 3,500 years old tomb, the fossil of a 40-million-year-old sea urchin was found. Engraved on the lower surface of the now petrified animal were a number of tiny hieroglyphs, traced in an arc around the opening corresponding to the sea urchin’s mouth – a veritable work of art in miniature. More importantly, the ancient writing made it possible to find out who the man was who found the fossil and also where he found it: a certain Tanofre (or Tjanefer), a respected priest who came across the sea urchin at the *quarry of Sopdu*, a locality that would appear to be located in the Sinai Peninsula. Sopdu, after whom the site is named, is an Egyptian celestial god, protector of the caravan routes and sometimes also called the “morning star.” The presence of the characteristic five-ray star on the fossil and the extensive use of this symbol by ancient Egyptians in their tombs would seem to suggest that these same fossils played an important role in burial rites.

Nothing, however, can hold a candle to what was found at the site of Héricourt in southeastern France. Here, at a burial site dating from the Bronze Age (about 3,000 years ago), a mound was discovered near a rock face in the late 1800s. Inside the structure was a small tomb containing a quantity of most diverse objects (a human skull, a large carved bone, a cup made from a deer antler). What was most surprising was that all these objects were covered with a mountain of sea urchin fossils: the entire mound was basically filled with these small round objects, and it is estimated that there were between 20,000 and 30,000 of them.

What was the real meaning of these urchins? Were they perhaps “ferryman” of souls? Were they used to resurrect their proprietors? Or were they simply objects that humans were very fond of? Possible clues to answering these questions come from folk beliefs: in some rural areas of England, since the Middle Ages these fossils were

known by the names of *shepherd's wreaths* and *fairy leaves*, and were placed on window sills to ensure increased bread and milk production. Some even placed them in front of their front doors to ward off evil.

A particularly useful episode for understanding the significance of sea urchins may be one that occurred during the Twelfth century in the village of Linkenholt, near Salisbury, when the local church was built; around the window facing the north side, the so-called *devil's side*, quite a few shepherds' wreaths were placed so as to keep Satan away. The funny thing is that by the time the church was rebuilt in the late Nineteenth century, the residents had become so fond of their little "fossil" window that they not only rebuilt it piece by piece (indeed, sea urchin by sea urchin), but made one *from scratch* on the south side as well. After all, the first window had done a great job and the Devil had never entered: so why not double the protection?

The *stone stars* and rosaries of Saint Cuthbert

Among the fossils, not only sea urchins kept the dead company. Equally numerous in Bronze Age graves are the remains of crinoids^{xiii}, the so-called *sea lilies* that still live today. Once dead, the stems of million-year-old crinoids broke down into small circular structures with a star-like shape in the center, called articles, the fossils of which are very common in various parts of Europe and constitute one of the main components of some rocks dating back to the Mesozoic era.

Unlike sea urchins, crinoids do not appear to have ever been protectors or ferrymen. At an Irish site known as *Kiltierney Deer Park*, a tomb was found containing, among other things, some pottery sherds and about 30 "starlets," ranging in size from 6 to 15 millimeters in diameter. Scholars believe that the latter were used as beads to make a necklace. Curiously, the authors of the scientific publication in which the Kiltierney site was described made a mere mention regarding the finding of the fossil crinoids, avoiding even depicting them (in contrast to all the other findings, which were well described and illustrated), and this in spite of the fact that their number was greater than the totality of the remaining objects (about 20 fragments).

This "forgetting" is not an isolated case: as we have- seen with Worthington Smith, fossils found inside prehistoric tombs have often been treated superficially by scholars of ancient artifacts; sometimes they have even been considered accidental "intruders" in burials, coming from the surrounding ground and exhumed by chance along with the de- functs. The issue was addressed in 2015 by Peter Leeming, in an article with the eloquent title "*Also Found... (Not Illustrated)...: The Curious Case of the Missing Magical Fossils*".

After listing numerous "levities" of researchers, the author scolds those archaeologists who do not pay attention to "grave fossils" and consider them mere background noise, when they could study them as evidence of possible magical beliefs instead.

Returning to our sea lilies, their strange "star-shaped" appearance also gave rise to some curious medieval legends, such as the one that flourished along the coasts of Northumberland. Often, after a swell hit the cliffs, locals would find tiny stone discs or, more rarely, small columns composed of several discs, strikingly similar to the beads of a rosary. Over time, popular tradition began to associate them with the cult of Saint Cuthbert, a Seventh century monk who lived on the local island of Lindisfarne (later also known as *holy island*), eventually becoming its bishop^{xiv}. According to legend, during stormy nights the spirit of the holy man wanders the

beaches creating “beads” so that his followers would find them the next morning and use them as beads for their rosaries. Obviously, the peasants of the Middle Ages could not have had the slightest inkling of the true origin of the petrified pucks. In any case, a 2001 survey suggested that the crinoid articles were associated with the cult of the saint only during the Twelfth century, and that the wide spread of this legend occurred two centuries later, coinciding with the opening of a large limestone quarry in the area. The availability of fossils evidently increased exponentially due to the work of the quarrymen.

This is a classic example of how a trivial mining activity inadvertently helped not only to spread a legend, but also to launch a new product on the market: suddenly, around Lindisfarne lots of children were selling “Saint Cuthbert’s beads” to travelers; the revenue must have been very profitable if it is true that crinoid items remained stable in souvenir stores until the 1980s.

During the Seventeenth century, hypotheses about the origin of the enigmatic “beads” began to flourish among the learned. The first written document on the topic is provided to us by botanist John Ray^{xv} in 1673: after a visit to the island, Ray came to the conclusion that rosary beads were nothing more than entrochi, a type of stone with a peculiar shape often found within limestone. Of a different opinion was physician Martin Lister^{xvi}, who in the same year considered entrochi to be “stones depicted as plants,” implicitly suggesting that they had an organic origin. Some fifteen years later, the British naturalist Robert Plot gave a meticulous description of these structures, and then claimed that Saint Cuthbert himself used them as beads for rosaries.

Isolated crinoid articles provided material for folklore in other parts of the world as well: in Germany, for example, findings gave rise to the curious legend of the coins of Saint Boniface (*Bonifatius pfennige*). The story goes that, around 700 AD, the saint was on a mission in Thuringia, a German region refractory to Christianization. To punish wealthy nobles who would not convert, Boniface turned all their gold coins into stone. The landowners, despairing at the loss of their fortunes, threw the stones in their lands; even today the “stone coins” are there as a testimony to divine punishment.

Legends and “peculiar” beliefs regarding the remains of sea lilies do not stop at the Middle Ages alone, however. Incredible as it may seem, isolated parts of these sea creatures (with a circular and often toothy outline) are to this day “sold” by the sensationalist press as “alien gears,” made by extraterrestrials millions of years before the appearance of man on Earth and abandoned to our planet when their builders decided to return to their home.

The giant “pine cone” of Kainua

In addition to sea urchins and sea lilies, it is worth mentioning another strange find that occurred in 1867 near Marzabotto, in the province of Bologna. At that time some excavations were underway in the Etruscan city of Misa, dating back to the fifth century B.C. and known today as Kainua. The work, financed by the counts of Aria (owners of the entire Misano plateau), was entrusted to the leadership of Count Giovanni Gozzadini, the last male descendant of a noble and very ancient Bolognese family that gave birth to warlords, politicians, doctors and jurists. Giovanni, for his part, was a great lover of archaeology.

In the course of the excavations, quarrymen unearthed a necropolis consisting of 168 graves, each topped with a spherical or rounded shape made of stone (usually sandstone). One of the graves, however, was different: instead of the typical rock

sphere, the burial had a strange structure resembling a colossal petrified pine cone, about 30 centimeters in diameter.

Interested as he was in the discoveries of skeletons and funerary objects, Count Gozzadini did not give particular attention to the bizarre find, that ended up in the pile along with the other sandstone “pebbles,” remaining almost forgotten in a corner of the Aria Museum, the collection of the Counts of Marzabotto. By a lucky chance, a decade later, during a visit, the collection was viewed by zoologist and botanist Giuseppe Bianconi, who recognized in that strange pine cone a type of plant now extinct, and mentioned it to Giovanni Capellini, one of the most important Italian geologists and paleontologists of the time.

The scholar, after nabbing the singular “tombstone,” certified that the pine cone was nothing more than a large silicified trunk fragment of a now-disappeared plant, dating back to the age of dinosaurs and belonging to the bennettitales group^{xvii}. The fossil was named *Cycadeoidea etrusca*, with an obvious reference to where it was found. Capellini dissected some parts of the fossil and studied it at length, realizing full importance: the trunk of this specimen, in fact, was the first evidence to provide clues to the probable location of the male inflorescence of the bennettitales, complete with pollen preserved within it.

From an archaeological point of view, the particular collocation of the object on the tomb suggests that the latter might have constituted a simple yet showy ornament, but it cannot be ruled out that the presence of the strange plant in the burial had deeper ritual meanings. The curious remnant, now dissected but still spectacular, can now be seen at the Capellini Museum, Bologna.