

## Cave levels in the Matienzo area

*Peter Smith*

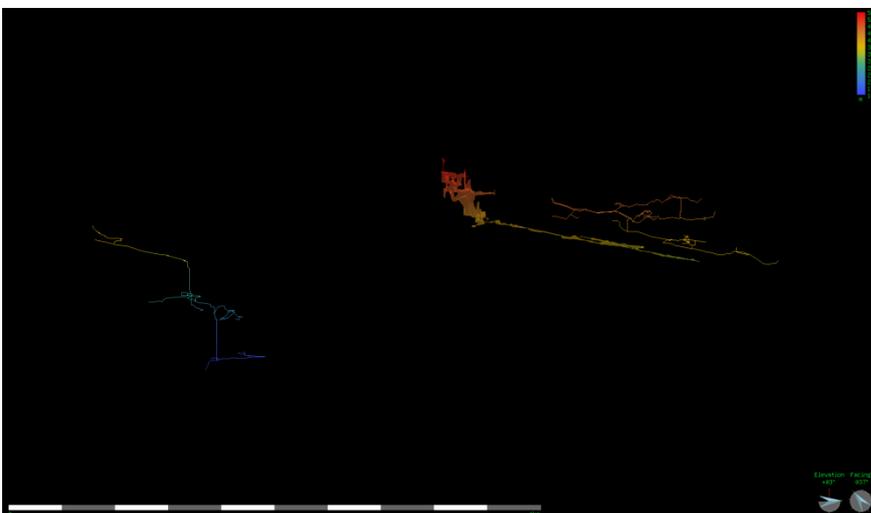
Andy Quin (2010: pages 296-298) defined cave development levels in many of the major cave systems in the Matienzo area. For example, in North Vega, he noted passages around 290m, 240m and 190m altitude, as well as possibly an incipient 4<sup>th</sup> level at about 155m (the SW end of Torca del Regatón). In South Vega, a high level is at 470m in Cueva del Abono, and in the system itself, there are levels at 330m and 240m. In Cueva Vallina, he recognised a level at 330m, which would correspond to the level at the same altitude on the other side of the hill, in South Vega.

Similar levels were observed in caves in other parts of Matienzo: in 0415, at 240m altitude and in Rascavieja at 330m.

The aim here is to up-date this description of levels, particularly as regards new discoveries since 2010 and by extending it to other caves.

First, what is understood by a 'level'? It does not necessarily mean a perfectly horizontal passage. For example, if the passage formed under phreatic conditions, we know that present sumps vary in altitude as they go down and up. But obviously the start and end of the sump must be more or less at the same height. Vadose passages form with a stream cutting down under gravity, so they cannot be horizontal. A passage that can truly be called a level would be more or less horizontal and cut through any beds of rock dipping at an angle.

Instead, we know that many passages follow dipping bedding planes or particularly are formed on the top of an impermeable sandstone bed. The Log Flume in Torca del Muérdago (2081) is good example. As this description says: "The cave has a number of sandstone beds/lenses that form the impermeable bed of the stream passage [...]. This results in the stream passage getting lower until it drops through the impermeable sandstone bed into a bigger passage. In this cave the beds dip down to the south and form a number of slides over the slippery sandstone bed" (2022 Expedition report by P. Papard). The Survex file shows how this lower passage slopes down towards the south-east. It is also remarkable that this passage mirrors very closely the passage in Cueva de Coquisera (0039). Similarly, passage in Torca de los Cantones (0865) also dips on sandstone beds. These then are examples of caves that are geologically controlled. However, higher altitude passages in 2081 might be 'levels', and will be mentioned later.



*Cantones (0865) on the left and Muérdago (2081) and Coquisera (0039) on the right. Surveys compiled in Survex by Juan Corrin.*

There must also be some kind of gradient towards the resurgence or ultimate outlet of the water in the caves; e.g., between Matienzo and Riaño, it is to be expected that passages further north towards the coast will be at a lower altitude than those further south, even if they belong to the same drainage system or level. However, water in Matienzo may have flowed towards the south in the past, in the same way that Orillón (0023) does today.

We're familiar with the typical diagrams that show a stream forming a cave, then the valley where it resurges is cut down, so the stream drops to a lower level and forms a new passage, and so on. The result is that the first or oldest levels are the highest and the lower levels are younger. But what would happen if there is hypogenic cave development, and the passages are formed by water rising from below? Then the deepest passages in a system might be older than higher ones. This may have occurred in Matienzo.

Another practical problem in determining the altitude of a possible level occurs in caves that have suffered serious roof collapses, as the roof space opens up and the floor is buried under large boulders, the height of the passage 'migrates' upwards. This could be the case, for example, of Cueva Rascavieja (0077).

1. *Beginning with South Vega, the most complete system in Matienzo.*

**Level 1:** The highest level can be broadly defined at between **470 and 495m** in sites 0875, 1128, 0050 and 0033/1470

- 0875 Horsetrough Pot: the survey shows big passages and chambers at the base of the entrance pitch, at 474-482m (all altitudes are taken from the Survex files). In the elevation they are shown as having a flat roof.
- 1128 Torca de la Vacunación: At the bottom of the pitches, Jumping Mouse Passage is at 479-480m.
- 0050 Torca del Serruco: passages on both sides at the top of the pitches are at 480-485m.
- 0033 Cueva del Abono: the entrance and first passage is at 497m, while the passage at the bottom of 1470 (which connects with Abono) is at 470m.

**Level 2:** This level is between **320 and 340m** altitude. It is represented most clearly by passages in Sites 0036, 0264, 0265, 0037, 0388 and 1332:

- 0036 Torca de la Vera Negra/Cabaña: the main passages, East and West Wanders, are at about 328-337m. Although 0388 comes very close to it, according to Survex the passages are a little lower, 315-319m.
- 0264 and 0265: Coterón and Copudia: The first level in Coterón at the bottom of the entrance pitch is at between 316 and 321m; nearby Copudia is at 324-334m.
- 0037 Cabritilla: The entrance pitch intercepts a passage at 323m.
- 1332 Cueva de Juan Lombrero: Western Passage follows a level at 335-336m.

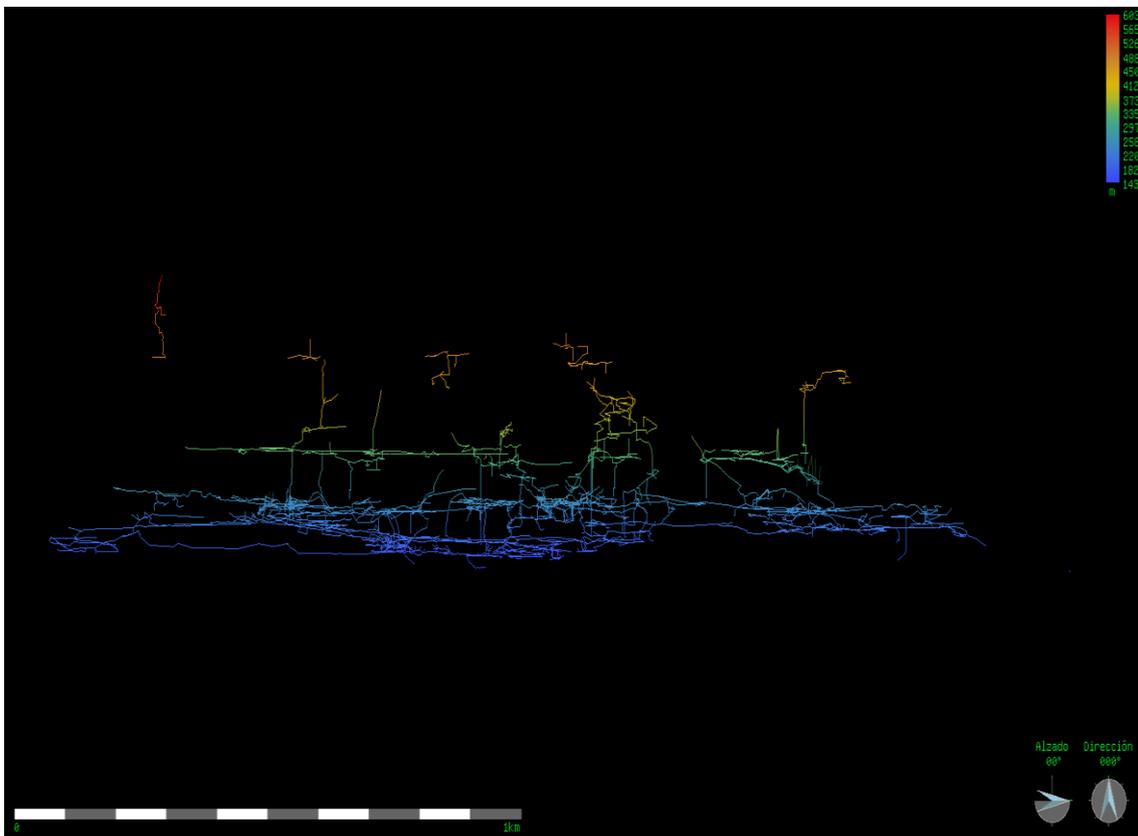
**Level 3:** Among the mass of passages below 300m altitude, one clear level seems to be at **230-250m**. It is found above all in 0264 Torca del Coterón, 0177, and also possibly in 1471, 0042 and 0458.

- 0264 Coterón: Extensive passages, from the Reñada arm to Frank's Passage and Marvin's Marvels, are at 229 to 243m.

- 0177 La Cueva: Possibly the continuation of Marvin's Marvels, passages in this cave are at 229-233m.
- 1471 Torca de Papa Noel: Altitudes vary considerably, but long sections in the area of Poppadom Passage are at about 240-247m, while Tailwind Passage is at 228-231m.
- 0042 Cueva de Cefrales: The main passage varies from 234 to 243m altitude.
- 0458 Hidden Hole: Passages here are possibly a little higher, at 247-252m.

**Level 4:** From Level 3 to present stream level, the series of passages become more complex, but a possible level exists at **195-215m**. Passages in 0048, 0264 and 0333 may belong to it.

- 0048 La Reñada: Passages at the western end of Stuffed Monk Passage and Sanatogen Series are at 208-218m (altitudes further east, in Breakdown Chamber and Crowbar Passage are a little lower at 188-190m).
- 0264 Torca del Coterón: Extensive passages connecting to Bootlace Passage in Reñada and towards the east are at about 196-206m.
- 0333 Azpilicueta: China Syndrome, the passage approaching Cueva Vallina, is at about 208-216m.



*Survex elevation of the South Vega system, stretched vertically to separate out the different levels*

2. *Cueva Vallina*. On the other side of the hill from South Vega and connected to it hydrologically. It is divided into two parts, only joined as far as we know at stream level.

Vallina 1:

- **Level 1:** The top entrance is at 408m, but the passage descends steeply from there. In places it is affected by large collapses. So it is not clear if it forms a true level. However most of the top passage is between 380m and 365m.

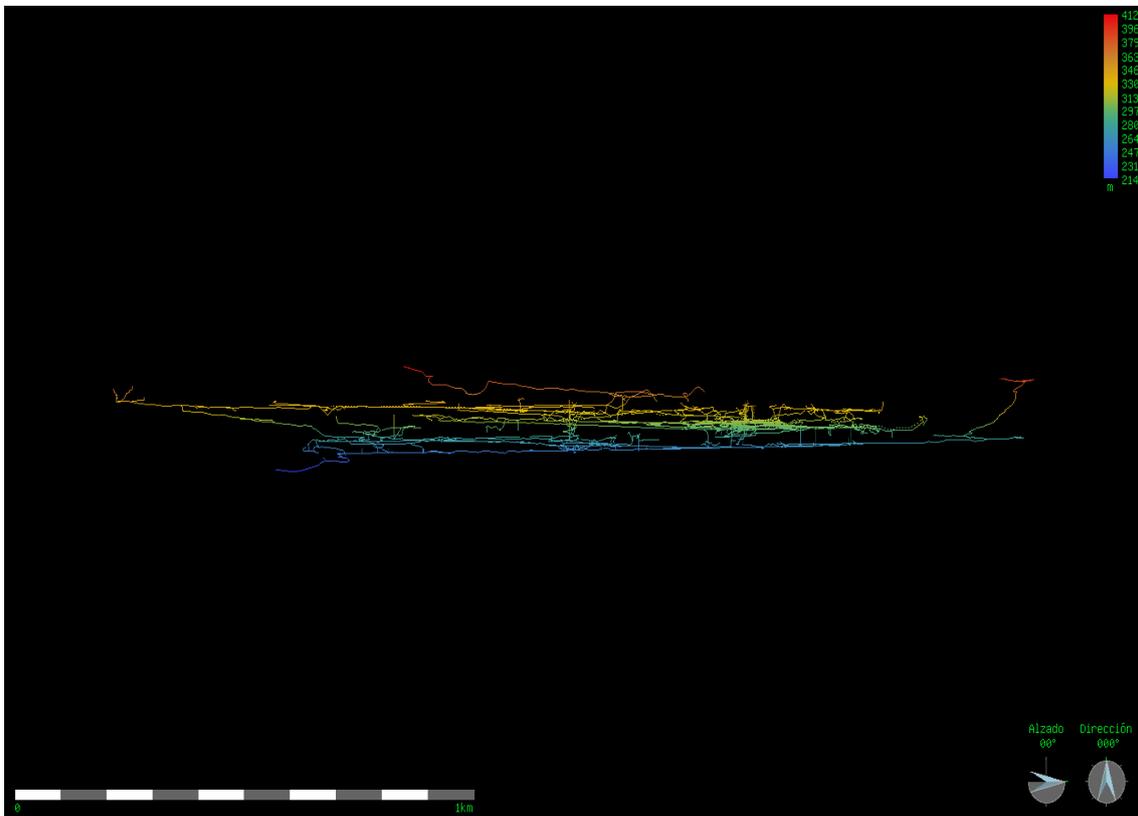
- **Level 2:** Several series of passages between about 340 and 325m altitude: e.g., La Unió and Albert's Grand Passage-Skyhook Passage.
- **Level 3:** Lost Pot Entrance is at 312m and it drops into the main level in Vallina I, at 310-295, including Road to Glory, Sandy Passage, 600 Pesetas Passage, etc.

Vallina 2

- **Level 2:** The main level in Vallina II is at between 340 and 325m: Galería de los Elefantes, Galería New York, etc.
- **Level 3:** Much shorter sections of passages are at 300-290m in the area of "The Passage that turned to Jelly".

The active passages descend gradually to about 255m at the start of the sumps. Another steep descent occurs in Sump 6, which reaches 214m. Through the upstream sumps, higher level passages are reached that climb steeply to a level at about 385m.

1176 Sima de la Garma de los Trillos: it descends from the entrance at 650m to a level at 346-350m (*Vallina Level 2*).



*Survex elevation of the Vallina (0733), stretched vertically to separate out the different levels*

3. *North Vega. In the first place, this refers to the caves connected in the Cubija System:*

**Cubija Level 1:**

0071 Torca del Mostajo: The highest levels in this cave are the passages below the entrance pitch at 270-285m altitude

**Cubija Level 2:**

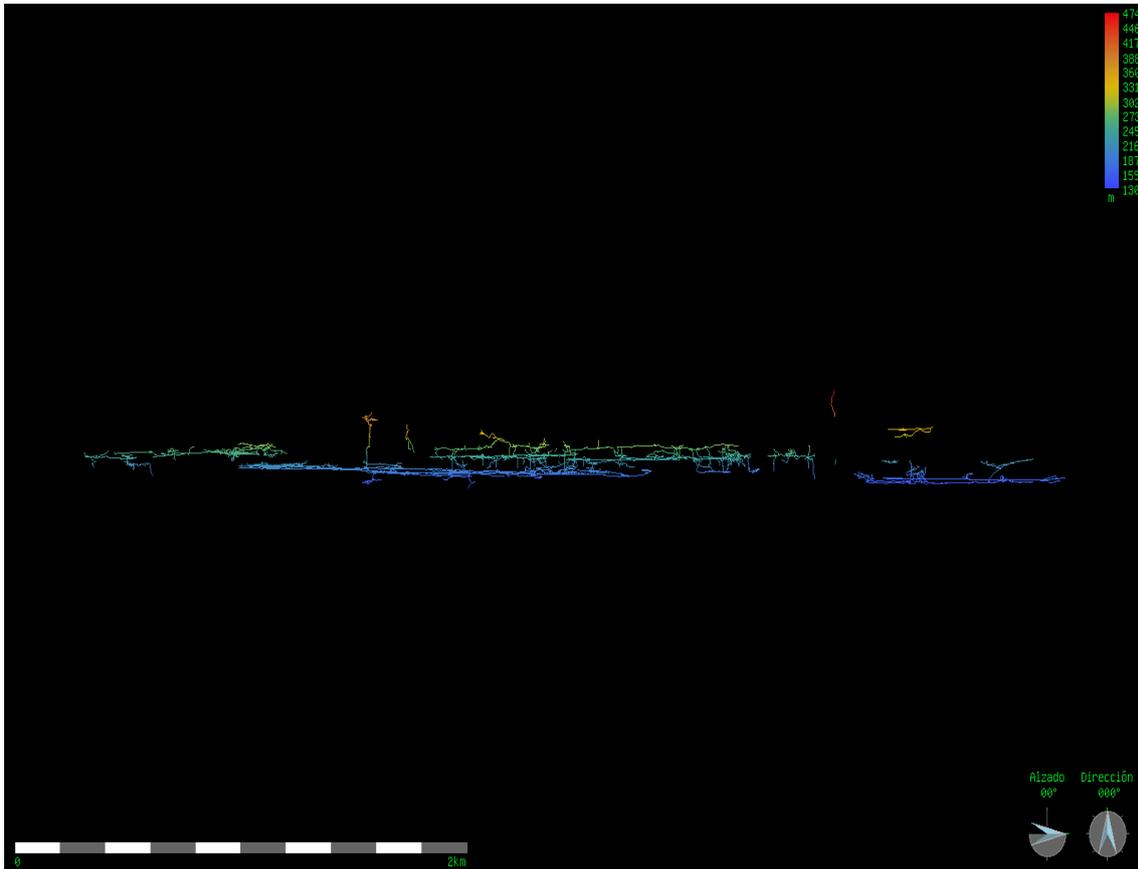
0071: the passages below the Golden Void pitch, at 230-238m

0774 Cueva de la Morenuca: the most extensive level in this cave is at 243-250m, it is therefore slightly higher than the level in Mostajo.

### **Cubija Level 3:**

0071: the lowest passages at 185-195m

0892 Torca del Regatón: the main level is at 180-195m, with the incipient level noted by Andy Quin (2010) at 155-160m.



*Surveys elevation of Mostajo and other North Vega sites, stretched vertically to separate out the different levels*

Not connected to the system, other important North Vega sites are:

0075 Simas del Picón: very near to the Cubija system, breakdown has altered the altitude of the passages and chambers, but a level can be identified at about 268-284m, the same height as *Cubija Level 1*.

0258 Torcón de la Calleja Rebollo (Toad in the Hole): to the west of the Cubija system, the highest passages, which hardly form a level, are at 285-290m. The most extensive passages range between 240 and 260m. A lower passage slopes from about 220 to 210m (not level), then descends to 175m. So, its highest passages are more or less equivalent to the Levels 1 and 2 in the Cubija system.

0415: on the other side of El Nanso hill, the passages are at about 243-251m (Cubija Level 2)

4. *El Nanso*. The caves in this hill overlooking La Vega, to the east of the Cubija system, are clearly at different altitudes.

1572 and 2997: These are two of the highest caves on the hill of El Nanso and contain cobbles showing that they belong to an old level of active caves. Their altitudes are at 416 and 417 m.

0077 Cueva de Rascavieja: This cave is affected by big boulder collapses so it is not easy to imagine the altitude of the original passage. However, the current heights vary between 313 and 345 m, coinciding with *South Vega Level 2*.

0061 Cueva de Asiul and 1294 Epiglottis Cavern: These two smaller caves are at this same altitude, 280m and 286m respectively, like *Cubija Level 1*.

0073 Cueva Sotarraña (Patatal): The big passage is at 220-240m. 0065 Cueva de Cofresnedo: Another big passage, it slopes from 235 to 200m. These are more or less equivalent to *Cubija Level 2*.

5. *Some other caves:*

#### **To the east of the South Vega system**

0413 Torca de la Mega Mujer: The main passage is at 235-240m altitude, therefore matching *South Vega Level 3*.

4669 Torca del Dron: Of the several passages intercepted by the main shaft, the most extensive is "Soft Furnishings" at 355-363m. It therefore does not tie in exactly with the main levels in South Vega.

2081 Torca del Muérdago: Currently being explored. An irregular passage is at 516-530m. A second level is at around 475-490m. However, both of these slope slightly to the south. The third level slopes even more on a sandstone bed.

0039 Cueva de Coquisera (Codisera). As said in the introduction, this cave mirrors 2081 quite closely and the passages tend to slope rather than be level. The top passage (Entrance to Galería de las 400 Pesetas) goes from 477 to 465m, which agrees with the second level in 2081. Other passages are at 446-436m and 404-397m; these would be intermediate levels in South Vega.

#### **In La Secada**

0087 Cueva de los Emboscados: The main passage is at 215-220m (like *South Vega Level 4*). A higher passage slopes from 239 to 233m.

0086 La Cuvía: The entrance level is at 295m, with the main passage at 278-284m (like *Cubija Level 1*).

#### **Four Valleys system**

At the northern end of the depression, most of the system is lower than the other sites described. One of the highest points in the cave is in fact the 'original' entrance of Torca de la Decepción, 0252, at 239m.

Much of the cave is active and cannot be described as a level. However, some of the most important fossil passages are in the Trident Series (Hoyuca, 0107) and in Life, The Universe and Everything (Llueva, 0114) at about 170-180m.

### Mullir ridge

0381 Cueva de Entrambascuetos: Passage at 489 to 497m (like *South Vega Level 1*)

0012 Cueva de Concebo: A short passage at about 425m.

0013 Cueva de Cuatribú: Most of the cave is between 438 and 442m (like Level 2 in Coquisera).

### Polje overview

- 470-495m: Relatively short and (now) disjointed passages in South Vega and a little to the east in 2081 (Muérdago) and 0039 (Coquisera). In the rest of the depression it is only seen in 0381 (Entrambascuetos). **S Vega Level 1**
  
- 435-445m: passages at about this altitude in 0039 (Coquisera) and 0013 (Cuatribú). Evidence of development in the southern end of the depression?
  
- 365-380m: large passage reached from the top entrance of Vallina 1, and possibly on the far side of the upstream sumps. **Vallina Level 1**
  
- 320-340m: extensive passages in South Vega and also in Vallina (particularly Vallina 2). In the rest of the depression in 0077 (Rascavieja). **S Vega Level 2, Vallina Level 2**
  
- 295-310m: the main passages in Vallina 1 (bottom entrance) and shorter lengths in Vallina 2. **Vallina Level 3**
  
- 270-285m: the highest level in Mostajo and Picón, also seen in Asiul and Epiglottis. This level is only detected on the north side of La Vega and in 0086 (La Cuvía). **Cubija Level 1**
  
- 230-250m: further important passages in South Vega (e.g., in Torca del Coterón - Marvin's Marvels) and in 0413 (Mega Mujer). In Mostajo below the Golden Void, in 0258 (Calleja Rebollo), in 0415, and also possibly in 0073 (Sotarraña) and 0065 (Cofresnedo). **S Vega Level 3, Cubija Level 2**
  
- 195-215m: passages around the Stuffed Monk area in Reñada and other parts of the South Vega system. Also possibly in Mostajo and Regatón. Further away, in 0087 (Emboscados).

	Vallina	South Vega	Cubija	El Nanso	Others
470-495m					0039, 2081, 0381
435-445m					0039, 0013
365-380m					
320-340m				0077	
295-310m					
270-285m				0061, 1294	0086
230-250m				0063, 0075	0415
195-215m					0087

The chart summarises the information but doesn't show the length of passage on each of those levels. That would be difficult to calculate but is obviously necessary to assess the relative importance of each level. Three levels appear to stand out: 320-340m (Vallina 2, South Vega, Rascavieja); 270-285m (Cubija etc.); and then 230-250m, with extensive passages in several parts of Matienzo, including curiously some of the most massive (or oldest) formations in the depression and some of the best helictites: Marvin's Marvels, Patatal, Cofresnedo, Mostajo, 415... Could it be that these passages formed before, or at least at the same time as, some of the higher levels, often with smaller passages and certainly small stal, by water flowing at depth (deep phreas) in the limestone before the Matienzo depression was eroded down to its present altitude? It may even have been hypogenic water, rising from below. For more information about hypogene caves, see for example, '[Hypogene Cave Morphologies](#)', *Karst Waters Institute Special Publications 18* or '[Hypogene Speleogenesis: Hydrological and Morphogenetic Perspective](#)' by Alexander Klimchouk (on-line).

Another factor to be considered is the sediment in those levels. Andy Quin (1995) describes a magnetic susceptibility study carried out on sediments in several Matienzo caves. One sample was from Coterón, at about 230m near the Edge of the World. Samples were taken in Mostajo, on the top level (280m) and the second level (240m). He found that all the samples in those two caves displayed similar susceptibility values, which were very low. That might support the sediment in both caves coming from a common source. The fact that the values were low would basically indicate a low iron content in the sediments.

Andy Quin (1995) Morphological links between distinct cave systems, as revealed by the magnetic properties of cave sediment. [Studies in Speleology Volume X, pages 5-19](#). William Pengelly Cave Studies Trust.

Andy Quin (2010) Matienzo Geomorphology. *Matienzo 50 Years of Speleology*, pages 291- 298.