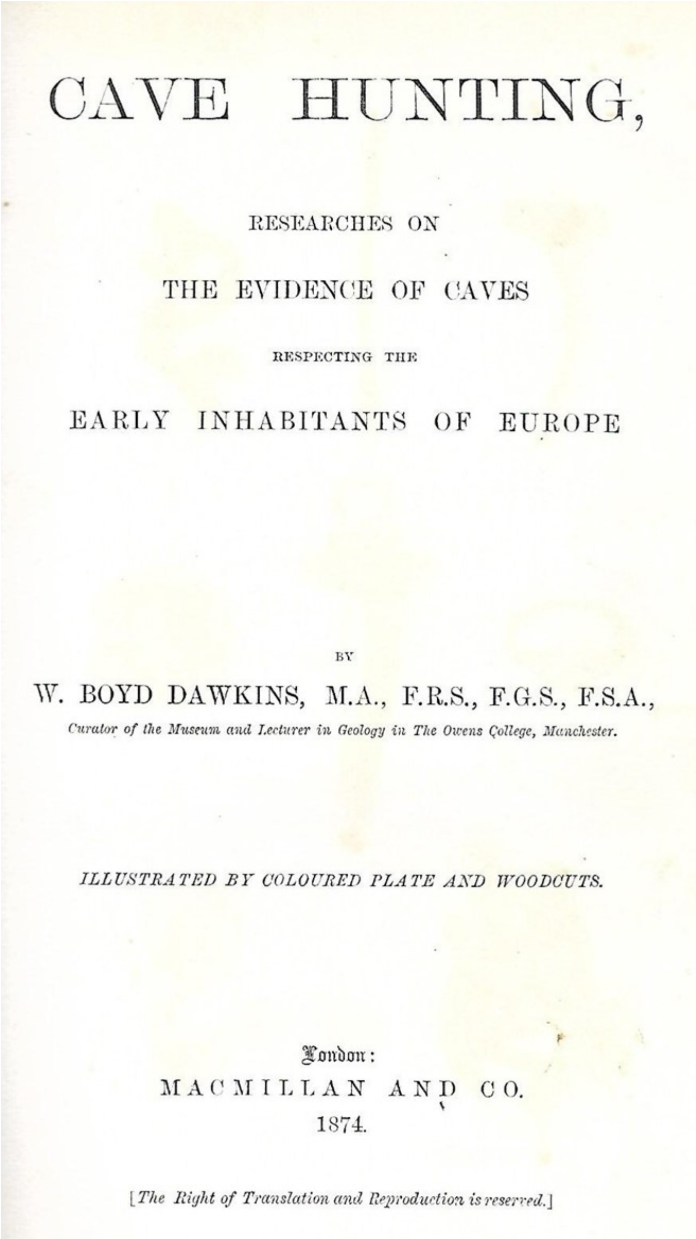
# ANDYSEZ 60-CAVE CORALLOIDS

**Andy Spate**

Sometime in the late 1960s my late mother found a copy of W Boyd Dawkins' wonderful 1874 leather-bound book, Cave Hunting. She purchased this for me at a cost of £7 (that's pounds – about $250 now – she also thought that the antiquarian bookseller nicked £20 from her purse whilst she was browsing!).



CAVE HUNTING,

RESEARCHES ON

THE EVIDENCE OF CAVES

RESPECTING THE

EARLY INHABITANTS OF EUROPE

BY

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*ILLUSTRATED BY COLOURED PLATE AND WOODCUTS.*

London:

MACMILLAN AND CO.

1874.

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Dawkins' book starts with the wonderful paragraph:

> The exploration of caves is rapidly becoming an important field of inquiry, and their contributions to our knowledge of the early history of the sojourn of men in Europe are daily increasing in value and number … In this volume I have attempted to bring the history of cave-exploration down to the knowledge of today and put it its main conclusions before my readers in one continuous narrative.

More about Dawkins below.

What does all this have to do with cave coralloids, I hear you cry? On page 67, Dawkins has an engraving (his Fig 17) showing his ideas on how these speleothems form. He was not the first cave scientist to discuss these features and probably will not be the last as we will see later. He termed these features Fungoid Structures. His text reads:

In the principal chamber in the cave, which is nearly free from drip, the upper surfaces of the stones and stalagmites on the floor are covered with a peculiar fungoid-like deposit of calcite, consisting of rounded bosses, attached to the general surface by a pedicle … sometimes not much thicker than a hair. The stood close together at various levels, following the inequalities of the surface of attachment, and being on average about 0.2 inch [5 mm] long. Several microscopical sections (Fig. 17) showed that each was formed on a slight elevation of the general surface, which would cause a greater evaporation [degassing?] of water than the surrounding portions, and therefore be covered with a greater deposit of calcite. This process would go on until the height was reached to which the water slowly passing over the general surface would no longer rise. Hence the remarkable uniformity of the heights of the bosses. The evaporation [degassing?] is greater at the point furthest removed from the general surface, and therefore the apex is larger than the base.

Shaw (1992, page 244) has this to say about Boyd Dawkins:

> Boyd Dawkins was well known in the second half of the 19th century, particularly in England, for his lectures and articles as well as his contributions to the Encyclopedia Britannica. His book, Cave Hunting, … must have been printed in large numbers, for it not uncommon even now [sobs, mum], though it is much sought after. (It is still sufficiently popular to have been reprinted in 1973) [available online as a facsimile edition] It was published in German. Despite Boyd Dawkins's primarily interest in cave archaeology, the book also contains a significant amount on other branches of cave study including speleogenisis and the growth of speleothems.

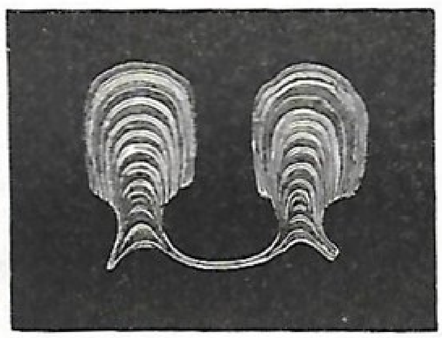

FIG. 17.—Fungoid Structures, magnified.

**Figure 1 (from Dawkins 1874, page 67) from Caldy Cave, Wales]**

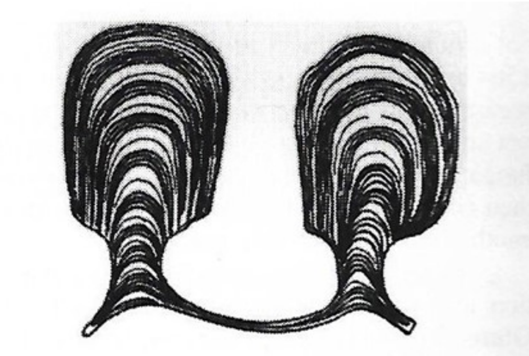

FIGURE 86. CAVE CORAL FROM THE FAIRY CAVE, CALDY (1874)

**Figure 2 (from Shaw 1992, page 213) from Fairy Cave, Caldy]**

Time to look at more recent discussions on cave coralloids – which, by-the-way, our American cousins call 'cave popcorn' – amongst many other names and morphologies.

Hill and Forti's (1997) Cave Minerals of the World has, as to be expected from this wonderful book, a comprehensive discussion of cave coralloids. I reproduce some of this below.

> Coralloid (or corallite) is a catch-all term describing a variety of nodular, globular, botryoidal, or coral-like speleothems. … Colloquial names for morphological varieties in this category are popcorn, grapes, knobstone, coral, clusterites, globularites, botryoids, spattermites, cauliflower and grapefruit. Coralloids range in size from tiny beads to gargoyle-like masses over 1 m in diameter. Coralloid knobs exhibit concentric growth rings in which crystals are perpendicular to the rings and radial around the knob. (see Figures 1—previous page, 2—above and 3—below).

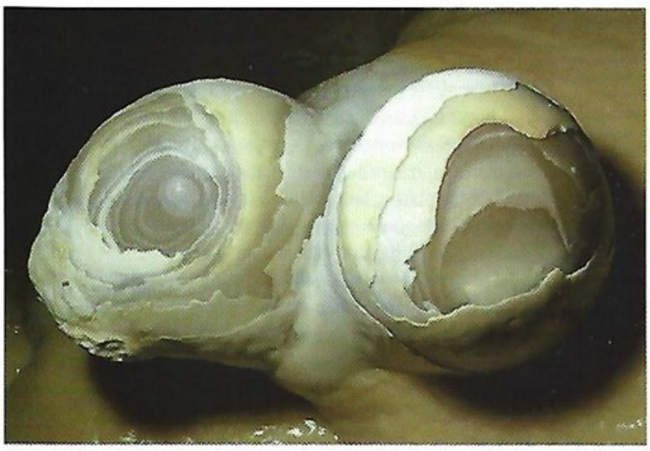

*Fig. 267. Internal layers of popcorn coralloids exposed due to dissolution, Lechuguilla Cave, New Mexico. Photo by Dave Bunnell.*

**Figure 3 (from Hill and Forti (1972) showing the concentric layering of these two popcorn coralloids)**

> … It used to be thought that all coralloids develop under water [subaqueous]. … Now it is known that most coralloids are subaerial deposits, generated by capillary-film water. They morphologically resemble their subaqueous cousins, but grow in air-filled passages not underwater. Distinguishing between subaerial and subaqueous coralloids can sometimes be difficult.

> … Subaerial coralloids assume [different] shapes, and they form due to a number of different mechanisms: (1) by water seeping through the cave bedrock and through the crystal structure of the coralloid itself; (2) by thin films of water flowing over wall irregularities; (3) by splash from dripping water: (4) by water moving upward from pools onto walls by capillary action; (5) by condensation water; and (6) by aerosols. All six mechanisms are similar in that they link coralloid growth to the presence of thin films of water (how or where the films originate is less important). Depending on the specific location one or more of processes may be responsible for coralloid growth.

The quotes above are from pages 59-60 of Hill and Forti.

Palmer (2007, page 288) states that:

> Coralloids are nodular growths of various types. The most common type is cave popcorn, which consists of small balls of calcite, aragonite, or (rarely) gypsum that project outward from bedrock surfaces or other speleothems … Popcorn makes cave surfaces rough and abrasive. In places it grows preferentially into windy areas or along bedrock projections … Some is precipitated by CO2 loss [degassing] especially in splash zones and has the texture of flowstone. Evaporite popcorn is chalky white and rounded so it resembles the edible varieties of popcorn, with knobs typically 5-20 mm across.

> In caves with poor air exchange with the surface, evaporation is limited to a crudely stratified zone, so that popcorn growth terminates abruptly in the upwards and sometimes downwards direction. Evaporative popcorn growth is limited to the lower parts of walls and sometimes erroneously interpreted as former pool deposits.

The again wonderful book, Speleothem Science (Fairchild and Baker 2012), adds little to our discussion of cave coralloids. We will have to get Andy B onto the job!

Let's look now at some examples from Jillabenan Cave, Yarrangobilly – kindly provided by Paul Sims (AKA Bernie – not to be confused with Bernadette).

**'Popcorn' wall – a mass of subaerial coralloids in a now very dry cave**

**Close up of the wall – note the black dirt – dust, fibres, skin flakes, soot that has eventuated from 110 years of use of this cave.**

**Hildreth-Werker and Werker (2006, pages 423 and 485) provide advice on the cleaning of silicate speleothems such as cave coralloids**

**Stalagmite with well-developed coralloids apparently influenced by airflow or possibly focused drip water. If airflow, it suggests some antiquity as it seems likely that Jillabenan has not had open access to outside air for very many years**

By the way, it is a good idea, when interpreting your cave coralloids to your visitors, to not call them cave corals - as we were wont to do in the past - shortly after talking about the corals that make up the limestone as it just adds to the confusion.

**The next ANDYSEZ will deal with cave pearls. If anyone has good images of Australian or New Zealand cave pearls, I would love to see them (and potentially use them – with acknowledgement, of course).**

References


Dawkins, Boyd W, 1874, Cave Hunting: Researches on the evidence of caves respecting the early inhabitants of Europe, Macmillan, London, 455 pp

*Fairchild, IJ and Baker A, Speleothem Science: From Process to Past Environments, 2012, John Wiley and Sons, Sussex, 432 pp

*Hildreth-Werker, V and Werker JC, (eds) 2006, Cave Conservation and Restoration, National Speleological Society, Alabama, 600 pp

*Hill, C and Forti, P, 1997, Cave Minerals of the World, National Speleological Society, Alabama, 463 pp

Palmer, A, 2007, Cave Geology, Cave Books, Ohio, 454 pp

Shaw, T, 1992, History of Cave Science: The exploration and study of limestone caves, to 1900, Sydney speleological Society, Sydney, 338 pp


**Note**: The books asterisked above should be in every show cave's library for staff to enjoy and learn from.