The Revised Edition of "The Formation of Thundereggs (Lithophysae)" is now available in a softback book. The price is $125.00 plus postage which includes a free CD with the latest revised edition of "The Formation of Thundereggs" The CD alone is $47.00 including postage.

COMPLIMENTS ABOUT MY CD & BOOK "FORMATION OF THUNDEREGGS" FROM PROFESSIONALS & AUTHORS:

"I AM CONSTANTLY AMAZED AT YOUR ABILITY TO SYNTHESIZE SCIENTIFIC DATA, I WISH I COULD WRITE AS COHERENTLY AS YOU."
Doug Moore, Senior Media Specialist, University of Wisconsin.

"I OWE YOU SO MUCH-DISCUSSIONS ABOUT THUNDEREGGS AND THUNDEREGG IMAGES "
Dr. Peter Woerner, Heidelberg, Germany, Author of Agate in Rhyolitic Spherulites.

"I AM ALWAYS GLAD TO PUBLICIZE YOUR WORK ..."
Dr. John Stockwell, graduate Magna cum Laude in geology, Yale University, 1957.

"YOUR CD ROM HAS THE MOST DETAILED INFORMATION ON THUNDEREGG GROWTH THAT I HAVE SEEN ANYWHERE."
Bob Landgraf, Colorado school of Mines.

"YOUR ATTENTION TO, DOCUMENTATION AND STUDIES I HAVE FOUND TO BE INCREDIBLE.YOUR WORK HAS INSPIRED ME TO VENTURE ON TO ANOTHER VERY EXCITING PATH, ALL ABOUT THE THUNDEREGGS."
Kris Menger.

"YOUR INSIGHTS ON AGATES EXCEED MINE. SO I JUST MEAN TO SAY THANK YOU."
John Marshal, author "The Other Lake Superior Agates."

"PERHAPS YOU NOW HAVE MY NEW PUBLICATIONS, WHICH WOULD HAVE BEEN IMPOSSIBLE WITHOUT YOUR HELP, THANK YOU SO MUCH!"
Dr. Peter Wagenplast,Stuttgart, Germany, Published excerpts from my CD in the professional magazine Mineralien Welt, Nov. 2010.

"I HAVE BEEN A BIG FAN OF YOURS FOR MANY YEARS."
Brad Cross co-author "Geodes: Nature's Treasures" With June Zietner.

"I THINK YOUR FIELD OBSERVATIONS ARE VERY DETAILED AND WELL ILLUSTRATED. THEY ALONE WERE WORTH THE EFFORT TO WRITE UP. I ALSO THINK YOU ARE ON TRACK WITH YOUR MODEL AND INTERPRETATIONS. NICE WORK!"
Will Moats.

"ALL IN ALL, IT IS A GREAT WORK YOU HAVE ACCOMPLISHED"
Dr. Gerhard Holzhey, igneous petrologist, Erfurt Germany, Publisher of many scientific papers especially one in 2003 I used and formatted to put on the Internet.

"I REALLY ENJOY YOUR BIGRAPHICAL ADVENTURES IN YOUR CD AND THE GEOLOGICAL INFORMATION IS AWESOME."
davidalanstuart@gmail.com

The original Formation of Thundereggs CD has been used throughout academia. John Stockwell, who graduated from Yale in geology *Magna cum Laude,* he has advanced my hypotheses in speeches at Stanford University in California, the U.S.G.S. symposium in Golden, Colorado, Sept. 2005 and the Agate Symposium in Minnesota in 2009. Also, it has been highly regarded by Dr. Gerhard Holzhey, an igneous petrologist in Erfurt, Germany and excerpts from my theory have been published by Dr. Peter Woerner and Dr. Peter Wagenplast, also of Germany, and Johann Zenz of Austria.

There are three main documents in the CD. One is the research paper I produced just prior to revising the Formation of Thundereggs, it being "Proposed Mechanisms for the Formation of Spherulites and Lithophysal Cavities. Formation of Thundereggs is second and third is my autobiography The True Adventures of the Geode Kid which is now 1150 pages long.

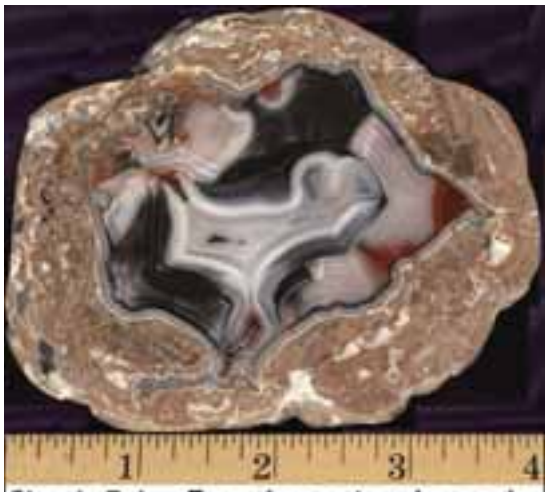
In 2004, I made a major change based on research data resulting in replacing the *preexisting* immiscible globule for the formation of thundereggs to one of crystallization that produced the immiscible appearance upon the solidification of its glass host. This form of differentiation resulted in two very different types of matter, in this case it was the separation of a hydrated obsidian from the non-hydrated obsidian that formed flow banding, spherulites and lithophysae (thundereggs), the latter three are lithic (stony) and the host became non-lithic amorphous perlite. Even though the amorphous perlite and the lithic products it hosts are almost chemically identical, it appears that the lithic character of the latter does not mix with the amorphous character of the former leaving as clean a separation boundary as that seen in water and oil.

I realized this one day as I started to recycle the kerosene we use in cutting thundereggs after the price more than tripled after being taken off the bulk sales market. I found that if I added water to the pump-bucket that receives the kerosene from the saw tank, the water immediately went to the saw "dust" driving the kerosene out to float on top of the water leaving the wet dust at the bottom of the bucket and the liberated kerosene is poured off to be used again. This became a great saving for us considering the price of kerosene today (2011).

This research also resulted in proof that the current definition of devitrification as defined by the Encyclopedia Britannica and others, including dictionaries, are completely inaccurate despite their authoritative position.

Chapters 6 through 9 and The Photo Gallery are more laymen and rock hound friendly with 75 different thunderegg locations given in the Locations Appendix. The Photo Gallery is open-ended so additional photos from the Geode Kid Collection can be added. The Photo Gallery is in alphabetical order by state county and deposit name. The great advantage of a CD is that you can pack a great amount of photos which has allowed me to put 350 of my research JPG color photos on it at no additional cost to you. They are 300x300 DPI set at about specimen size. I have placed some of the more strategic photos in this brochure below along with maps, diagrams and museum cases.

If you have the original CD 1999 edition, keep it because it has merit in its own right. It was the first attempt to construct a comprehensive theory about the formation of thundereggs based almost purely on field observations and speculation. It was a very close guess and the data now contained in the revised CD and the softback book will show how close of a guess it was. This work will be the springboard upon which further research will advance, to confirm or discard hypotheses derived from the existential perspective in more than 60 years I have spent in the field.



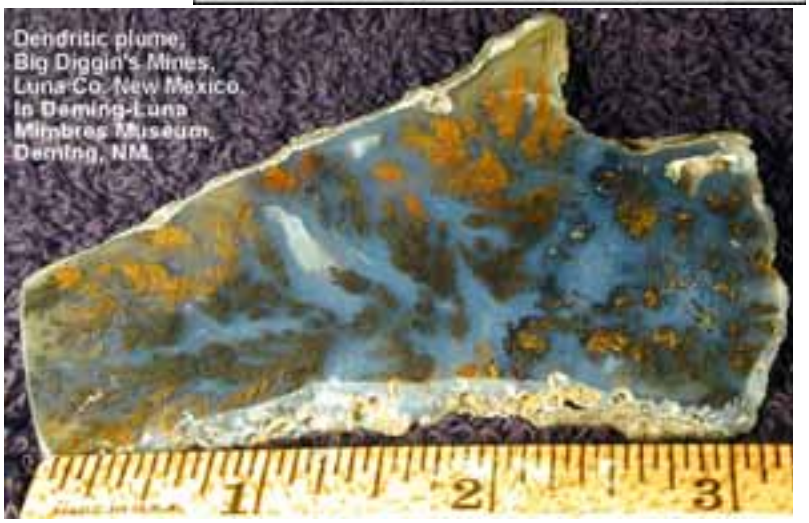
Classic Baker Egg mine agate colors and mineral zoning. Scan by R. Paul Colburn, 12-2010

Priday Blue Beds, Oregon Fault shifted and resilicified breccia in fracture and cavity. Width, 9 cm. Photo by Chris Algar

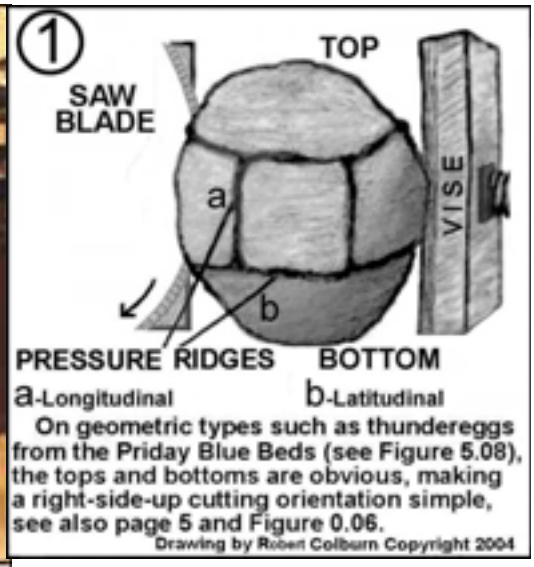
Buchanan, Oregon famous "Picture Thunderegg" looking at breakers out of a sea cave. Width 14 cm. In Deming-Luna Mimbres Museum, Deming, NM.

One of the best "Templeton biconoids' ever found. Fuzzy sagenite lines the bottom quarter. From Templeton, Calif, the pair of this one is in the Deming -Luna Mimbres Museum, Deming, New Mexico. Width, 20 cm. Photo by R. Paul Colburn.

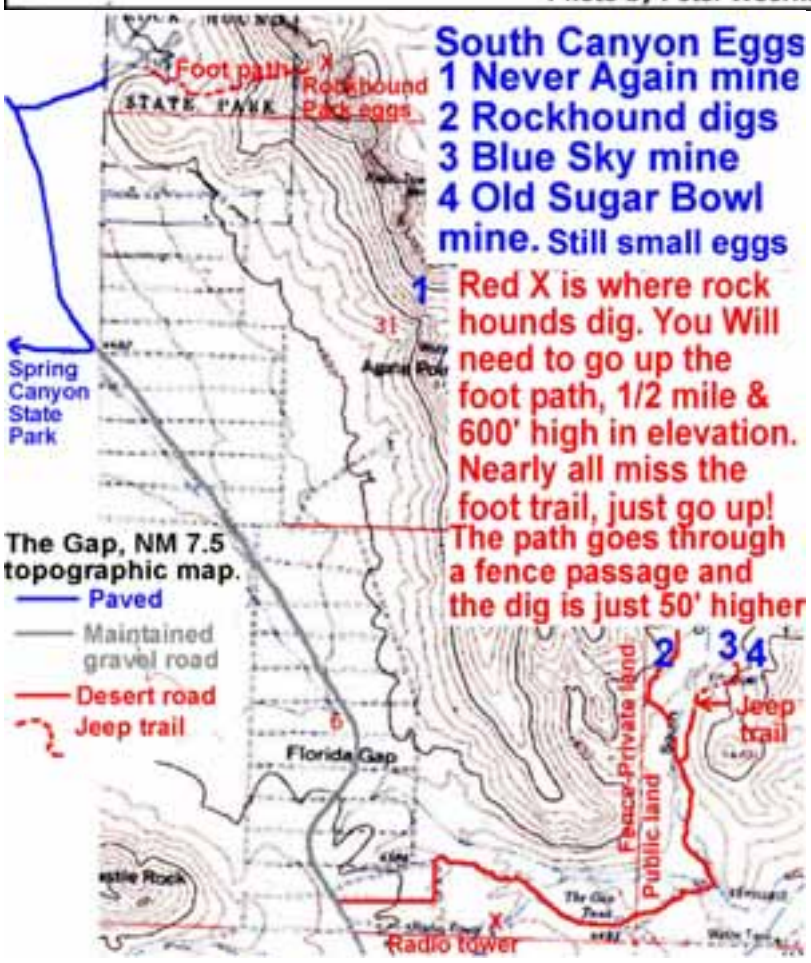
These cabs were cut from 1.5 to 2 inch thundereggs from the Baker Egg mine.



The International Thunderegg Safari at the Geode Kid Collection in the Deming-Luna Mimbres Museum, October 15, 2006. Left clockwise are Dr. Peter Woerner, Dr. Gerhard Holzhey, both from Germany; The Geode Kid, John Stockwell, Berkeley, California; Tim DiGennaro, The Dalles, Oregon; William Anderson, Deming, New Mexico; Bob Zorich, Alaska, Last person front right- unknown. A field trip to the world famous Baker Egg mine to study thundereggs in-situ followed.
Photo by Peter Woerner.

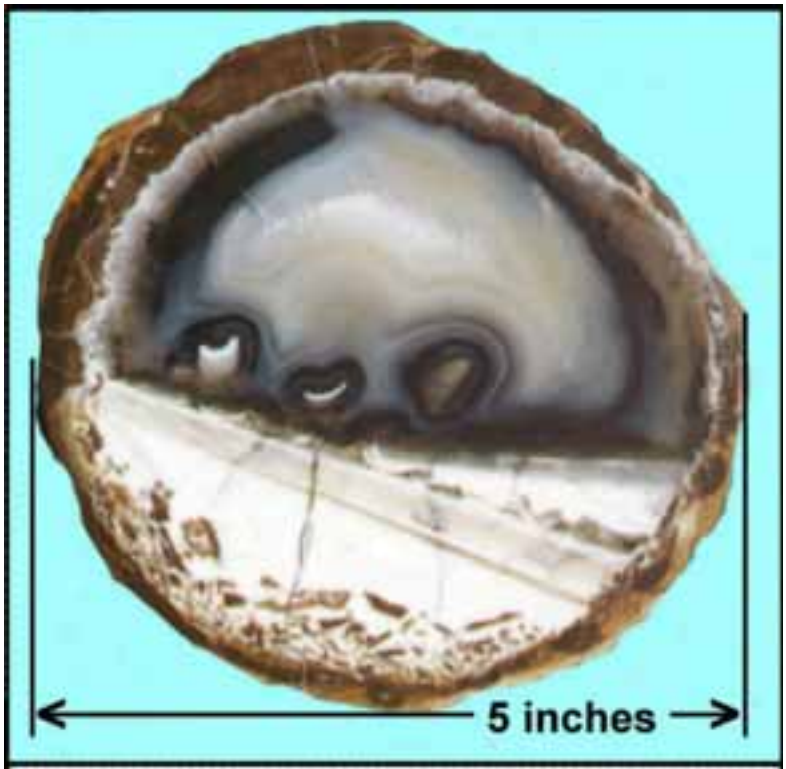


On geometric types such as thundereggs from the Priday Blue Beds (see Figure 5.08), the tops and bottoms are obvious, making a right-side-up cutting orientation simple, see also page 5 and Figure 0.06.
Drawing by Robert Colburn Copyright 2004



There are cutting orientation diagrams like this one above and instructions on how to cut thundereggs right-side-up so inclusions and filling sequences are in chronological order. You will also find topographic maps like this one at the left which are now in The True Adventures of The Geode Kid which is in the CD accompanying the book. There are 75 locations given in the book in the Locations Appendix which gives the map names and coordinates. This is a much better way to find deposits than transitory objects and distances between them which can disappear in floods or fires. Some locations have GPS coordinates added, but these can change with floods and fires, so the old quarter section, Township and Range are the best. A tutorial on how to use topographic maps is found in both the book and CD.

Below are photos of parts of the Geode Kid Collection in the world-class Deming-Luna Mimbres Museum in Deming, New Mexico. The collection has taken me 60 years to collect. It is a "location collection" set in an educational manner to show varying suites in each deposit and distinct habits each deposit has that allows location collectors to tell exactly where a specimen comes from. The labels describe geologic events that affect thundereggs that have allowed geologists to describe events such as uplift faulting and mining feasibility of other rocks and minerals, an excellent example is found in the book and CD where tilting of waterline fills determined how much overburden must be removed to mine perlite, Weber, R. (1957) see photo of an angular unconformity in a thunderegg from Rockhound State Park below.



Angular unconformity in a thunderegg from Rock-hound State Park, New Mexico. This specimen opened the door to academia and made the CD possible.

Diffusional Channel "fill tube" Baker Egg Mine, Luna County, NM. X 10 mag. Field of view 2 cm. Photo by Chris Algar

At right above is an amethyst filled diffusion channel (fill-tube). Note how agate bands acquire width the further away from the tube entrance into the cavity.This is to be expected because the further away into the larger room of the cavity the silica and clay travel, the slower it moves and more of it is deposited.

At left is only part of one of eight large cases filled with specimens and donated to the Deming-Luna Mimbres Museum in 1998. Each case holds from 200 to 500 flawless thundereggs from more than 100 locations. One case is reserved for specimens other than thundereggs with a selection of amygdaloids, septerian geodes and nodules, vein agates and jasper and limb section rounds, most all dug by me throughout the 60 years of my odyssey of living under the stars. Below are photos of the Baker Egg Mine and another case in the Deming-Luna Mimbres Museum.

Anti-theft catalogue. Geode Kid Collection Case 7 at Deming-Luna Mimbres Museum photographed ca. May 26, 2006. Top row left Opal Mt. Barstow CA. right location unknown but said to be near Ludlow, CA. Middle and bottom rows are at left Templeton biconoids, right Hwy. 46 thundereggs near Paso Robles, CA., Lower right are from Lone Hill, San Jose CA. Now extinct.

The 'Geode Kid' (White hard hat) in deep theoretical conversation about thunderegg formation with 2 agate experts who came over from Europe to discuss things with him and to see the mine operation. The Kid has been developing Baker for over 20 years now, and his theory of thunderegg formation since his teen years, and now has his development theory on a CD and is being quoted by many geologists in their symposiums and published papers.

And to my publisher who stayed by me despite our differing on some hypotheses, Thank you Don Kasper for publishing this book pictured below. Robert Paul Colburn, Author

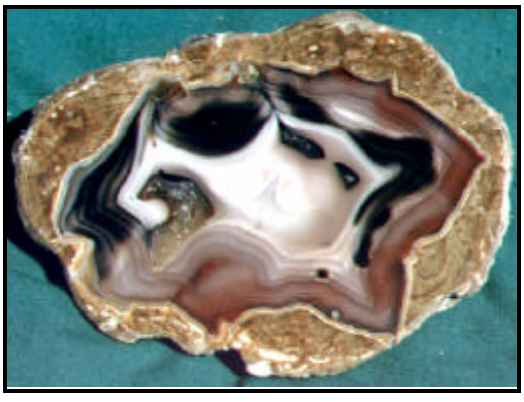
The Formation of Thundereggs (Lithophysae)

Robert Paul Colburn

Flow Stretched Lithophysal Tube. Blue Sky Mine, Little Florida Mts. Deming, New Mexico

Angular Unconformity. Deming, New Mexico

Breccia Filled Fault. Priday Beds, Oregon



Adsorptive Mineral Zoning. Baker Egg Lode Mine, Deming, New Mexico