In Bologna, Italy during the first decade of the 1600s, a cobbler named Vincenzo Casciarolo discovered a stone in nearby hills which became phosphorescent when "calcined by art." This material, which became known as the "glowing stone of Bologna" or "phosphoro di Bologna" was the subject of intensive study by many alchemists and chemists through the years. Many recipes were developed, most of which included secret ingredients, but a basic theme included such things as eggs or charcoal and a "firing to redness." Throughout chemical history, the study of various "phosphorus" materials has always been of keen interest and has led to the discovery of such materials as "Baldium's phosphorus" or "Hermetic phosphorus" (calcium nitrate), "Canton's phosphorus" (calcium sulfide), the element phosphorus, itself, or the mineral fluor spar (calcium fluoride) from which the name "fluorescence" originates. Today we know "Bologna stone" is barite (barium sulfate). Actually, the active phosphorescent form is barium sulfide, reduced from the original barium sulfate. Recent studies by Italian chemists have tried to duplicate the original recipe, and it appears that an admixed metal is necessary and probably was one of the secret ingredients. This added metal probably served as a doping ingredient, which today forms the basis of certain luminous paints, such as "Balmain's Luminous Paint" described by Oliver Sacks in his recent book "Uncle Tungsten."

Our spoor to the discovery of "phosphoro di Bologna" originated from Lémery's account which located the main site of Bologna stone as "Mt. Paterno about one French league" (three statute miles) from Bologna, Italy (Note: in the literature there are variants of the spelling of "Paterno" and "Roncrio"). By various queries we were able to make connection with Gian Luigi Felice, curator of the Geological Museum of the University of Bologna, who graciously accompanied us to a modern site where the Bologna stone could be found. A short drive from the medieval walls of Bologna (Figures 1 and 2) took us to the heavily eroded gray argillaceous (clay) hills (Figure 3) where pieces...
of Bologna stone could be found (Figure 4). These pieces were originally part of a large concretion, a “boule tuberculeuse frbreuse et radiee” (swelling nodule of radiating threads) (Figure 5) formed by a selective crystallization of alkaline earth sulfates in the clay hillsides. Hence, as one dug through the muddy slopes of Mt. Paderno, the discovered shards of the original concretion would vary from light to heavy, (calcium or barium sulfates, respectively) (Figure 5). The best samples of complete nodules of Bologna stone are on exhibit at the Bombicci Museum at the University of Bologna (Figure 6).

In original accounts, the “Bologna stone” could be observed in three sites: “Monte Paderno, Roncaria, and Pradalbino.” Gian Luigi Felice and other geologists of Bologna University were well aware of the first two sites (Monte Paderno and Roncrio, see Figure 2) but had never heard of the third site, the exact location of which shall probably never be known. However, other locations where the barite concretions can be found are notably at Monte San Giovanni (N 44° 24.67, E 11°09.94, approximately 12 km WSW of Monte Paderno). Taking the train from Bologna to Rome, in the stretch a few kilometers south of Bologna, one can spot several locations of the typical clay badlands (Figure 3).

To continue the story from phosphoro di Bologna to modern times, we must travel to Sweden, France, and Great Britain. In the middle 1700s Gottlieb Gahn and Carl Wilhelm Scheele of Sweden recognized “Bologna’s stone” as identical to “heavy spar” from Sweden and recognized “barium” as a separate earth. In 1789 France’s Antoine-Laurent Lavoisier recognized barium as one of the elements (“baryte,” or “terre pesante” = “ponderous earth”). In 1808 Sir Humphry Davy through his voltaic pile isolated metallic barium. However, each of these stories must wait for a future time.

Acknowledgments

We wish to thank Gian Luigi Felice, Dipl. Scienze della Terra e Geologico, Museum Bombicci, Piazza di Porta San Donato, 1, Bologna, Italy, who directed us to the Bologna stone sites and furnished historic and geological information.
Ages. Already by the 12th century the University of Bologna has a long history dating back to the Middle Ages. Already by the 12th century the University was famous throughout Europe and attracted students in law, medicine, and other disciplines. Agricola studied medicine here in 1524 before his famous mineralogical researches in the Saxony-Bohemia region.

Literature Cited


3. Reference 1, p 370.


Figure 6. The Bombicci Museum (geological museum) in the University of Bologna which is famous for the Bologna stone, amber, and other specimens. The University of Bologna has a long history dating back to the Middle Ages. Already by the 12th century the University was famous throughout Europe and attracted students in law, medicine, and other disciplines. Agricola studied medicine here in 1524 before his famous mineralogical researches in the Saxony-Bohemia region.

Figure 5. Specimens of various forms of barite, BaSO₄. Upper-left: a "tubercule of radiating fibers," the "Bologna stone," exhibited in the Museo Bombicci, University of Bologna. During the crystallization process, the differentiation has created a core of calcium sulfate and an outer layer of barium sulfate. Lower-right: pieces of "Bologna stone" found by the authors at Monte Pudern; sometimes the shards were light (calcium sulfate) and other times heavy (barium sulfate). Upper-right: most common form of barite, in the form of plates, collected by the authors in Colorado. Lower-right: famous barite roses of Oklahoma, collected by the authors.

Amy Y. ALBL, Gamma Beta '95, writes "I am a 28 year old breast cancer survivor. I would like to write my story to create awareness among young women. Please e-mail or call if you are interested. Amy_y_albl@groton.pfizer.com (860) 691-1415."

Luciana ARONNE, Beta Pi '89, and her husband Brian Ross are happy to announce the birth of their first child, Angelica Aronne Ross, born on January 9, 2002. All are doing well.

George BALASKO, Gamma '83, joined Research Organics, Inc., as Maintenance Manager in June 2001. My duties include engineering projects, managing a staff of 8 mechanics, and facility security.

James BIDLACK, Beta Nu '80, married Amy Sherrill Bidlack on June 29, 2001. Dr. Bidlack and his wife had a great honeymoon in Arkansas and recently had a baby daughter, Hanna Linsley Bidlack on March 29, 2002. Dr. Bidlack has been promoted to full professor at the University of Central Oklahoma. He is also a recent co-author of Introductory Plant Biology, 9th ed., by Kingsley Stem, Shelly Jansky, and James Bidlack.


Lawrence C. CERNY, Gamma '51, is looking for partners in his Blood Research and Decontaminants work at cernyland@msn.com.

Julie Ann CONNER, Alpha Sigma '93, and Farid Gary Jafar were married April 27, 2002.

Ted ERIKSON, Alpha Psi '51, is still swimming the waters with Umbra, the only dog to swim from Asia to Europe as covered by National Geographic. See their webpage at www.SdogV.com.

Robert FELTS, Alpha Upsilon '40, would like to hear from brothers who lived in the house at 341 Evergreen in East Lansing in the 1941-42 era. bobmmifelts@aol.com.

John Mike FERGUSON, Kappa '86, has completed his seventh year at the University of Central Oklahoma (Edmond). He was promoted to Associate Professor in the fall of 2000 and granted tenure in the fall of 2001. He recently completed work on two American Chemical Society committees: one to write the latest version of the ACS organic chemistry test and one to write a study guide for students preparing for the exam.

Janet L. FORD, Gamma iota '92, started PA school at Arcadia University in Philadelphia in May 2002.

Thomas A. GOVER, Alpha Gamma '54, retired to teaching a fall term general chemistry section after 33 years full-time at Gustavus Adolphus College.