FRIENDS OF MINERALOGY
Pennsylvania Chapter

NEWSLETTER

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PRESIDENT'S MESSAGE

Election

We are preparing our next election. If there is anyone interested in holding office on the Board of Directors, please contact me (address, phone number, and e-mail address are below). For the organization to continue to operate efficiently, we need active members. The Board meets four or five times a year, usually at a member's house. Lunch, socializing, and a view of the member's collection are included. Terms are for three years. If you would like to see what one of the meetings is like, call me, and we can make arrangements for you to attend one. In addition, new ideas are always welcome, and we have jobs for members who live at a distance and would like to help out.

F.M., Pa. Chapter, Symposium

The theme of the Symposium on October 24, 25, and 26 at West Chester University will be" Carbonates." The new facilities of the Geology Department at West Chester are excellent; Dr. Leeann Srogi is making the arrangements with George Rambo. We have a fine list of speakers, including a keynote speaker after buffet lunch in a convenient campus room. Last year, the auction included many items of interest, such as books, periodicals, memorabilia, and specimens. George Rambo (302-798-4163) is collecting items from now on, so go through your bookshelves and collections. A registration form will appear in the Summer *Newsletter*, planned for August. Please mention the Symposium, designed for all collectors, at your Club meetings.

Newsletter

This issue marks the beginning of the twenty-fifth year of the *Newsletter*. We still need someone to replace Juliet Reed, who hopes to be moving to a retirement community next year.

Roland Bounds, President

Officers of the Board of Directors

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MEMBERSHIP INFORMATION

Dues

Remember that **1997 dues are now $15.00 (seniors and students, $10.00).** Membership cards are included for paid-up members who have not yet received them. Members who have not yet sent in their dues will not receive a Summer *Newsletter*.

Coming Events

August 8-10: East Coast Gem, Mineral, and Fossil Show; Springfield, Mass.; contact Martin Zinn Expositions, P.O. Box 999, Evergreen CO 80439-0999.

August 13-17: Lost Dutchman Gemboree; Lebanon Expo Center off Route 72, 5 miles N. of Pa. Turnpike Exit 20.

September 19 and 20: Symposium on Lead, Zinc, and Iron Minerals, sponsored by the Pennsylvania State University Mineral Museum and the Nittany Mineral Society; for information, call Andrew Sicree at 814-865-6427.

October 4: Pennsylvania Earth Science Association Autumn Mineralfest; 9 a.m. to 3 p.m., Macungie Memorial Park Building, Macungie, Pa.

Oct. 18-19: Mineralogical Society of Pennsylvania "Earth Treasures" Gem and Mineral Show: Solanco Fairgrounds, Quarryville, Lancaster Co., Pa.; Sat., 10 a.m. to 6 p.m. and Sunday, 10 a.m. to 5 p.m.

Oct. 24, 25, and 26: F.M., Pa. Chapter, Symposium on Carbonates, West Chester State University; Friday night "What's New," Saturday talks, luncheon, auction; Sunday field trip; registration forms will be in the Summer *Newsletter*.

GEOMICROBIOLOGY:

INTERACTIONS BETWEEN MICROBES AND MINERALS

Editor's Note: For a long time, the definition of a mineral seemed cut and dried. But, was it, really? A mineral had to be solid (well, mercury is an exception), crystalline (what about mercury?), naturally occurring (remember the controversy about the burning Pennsylvania coal mine dump "elements and compounds" back in the 1970's?), and inorganic (what about teeth and bones, not to mention many deposits attributed to bacteria, algae, and other organisms?). Now where does that leave us? Healthily skeptical?

Geologists will address the inorganic/organic problem, according to an announcement in *The Lattice* , newsletter of the Mineralogical Society of America, at a conference in Utah, October, 1997, which will emphasize the natural relationship of microrganisms and their geological surrounding, emphasizing their interdependence. ....."This short course will teach geologists about the ways in which microbial activity impacts what have been traditionally inorganic processes, and microbiologists, and other life scientists about the mineralogical and geochemical aspects of biogeochemical system." .....

The topics include talks on biologically-mediated precipitation and molecular genetics, as well as one on algal precipitation of carbonates, silica, and silicates. These, and other topics to be covered, should bring about more awareness in geologists' (and collectors') minds that the earth's systems are inter-connected.

VISITS TO THE NEW GALENA LEAD-ZINC MINES, BUCKS CO., PA.

PART I: 1930 - 1962

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The New Galena lead-zinc deposits, three miles northwest of Doylestown, on the north branch of Neshaminy Creek, are the easternmost Pennsylvania examples of the Phoenixville-Perkiomen type of silver-lead-zinc-copper deposits. Other veins of this type occur in the Connecticut Valley of Massachusetts, near Northampton, and to the north into southernmost New Hampshire. Veins of very similar geology occur in Shawungunk Mountain, from northeast of Port Jervis to an area past Ellenville, New York. Geologically, these veins of zinc-lead-silver-copper are very similar to each other in almost all respects. They are not, in my opinion, similar to Mississippi Valley type deposits, as proposed by several authors who had not seen much of the Pennsylvania deposits. All of these districts are known for their fine crystals and rare minerals.

The New Galena veins are now under a large reservoir, surrounded by lovely Peace Valley Park, but when my brother, George R. Heyl, and I first visited the mines in 1930, they had been last worked in the late 1920's. The tramway track that went northwest to the village of New Galena was only recently rusty, with tram cars still on it at the new shallow shafts and buildings on the northwest side of Neshaminy Creek. I would estimate that the last operation was in 1929, or, possibly, 1928. We visited New Galena again several times in the 1930's, and once with my wife, Maxine L. Heyl (also a collector), in the late 1940's. The next visit was with Paul Herbert, chief geologist of Goldfields American, in the early 1950's. The last visit was when the land was being cleared for the reservoir, about 1962, with M.R. Brock, Wayne Hall, and Irving Friedman, all geologists, then with the U.S. Geological Survey.

All the workings shown by Smith (1977, p. 240-241) were observed on these visits, plus several other workings later bulldozed over. For example, a shaft was located on the bank southeast of Neshaminy Creek, about 1000 feet S45°W of the main workings. On these dumps, we saw sphalerite, galena, and angular pieces from a diabase intrusion. This shaft would lie a very short distance northeast of the northwestward trending "probable" fault on Miller's 1924 map (Fig. 2, p. 19).

According to Miller (1924, p. 17), sometime before 1856, residents of the region found pieces of a hard black mineral while digging wells. It was supposed to be coal, but wouldn't burn. In 1856, a piece was washed from an embankment of a mill race, probably the one that passed northeastward through the farm on which the mines are located (see Fig. 1, Ashmore, 1863). This piece of unusual rock was tested and found to be galena. In 1857, two Doylestown men dug out about 30 pounds of lead ore, but did no further prospecting. In 1860, two men digging post holes encountered a large block of lead ore, which excited their curiosity. According to Miller (1924, p. 17), they had it smelted in a local blacksmith shop, and obtained lead.

This find led to the securing of an option on the property by Mr. Montroville W. Dickeson (1860a), a man with a medical degree, who became a mining engineer and an "economic geologist." W.P. Blake, by the way, mentions him (1853) as mine superintendent of the Friedensville mines, and, in 1860, he made an examination of the Gap nickel mine (Dickeson, 1860b). Dickeson (1860, p. 4-5) also states that he opened a regular vein structure of galena. He prospected here, apparently on the north side of the road that divides the 104-acre property. At this spot he found a small, low rise, which showed a northwest-trending vein outcrop. A similar outcrop was located on the vein trend, just southwest of this dividing road. He says that after unsuccessful prospecting for lead deposits elsewhere in the state, he spent six months successfully prospecting the New Galena deposits. He started a shaft in the discovery outcrop northeast of the road, and sank it into the vein, to 38 feet in depth. He says that the vein was in a dark slate,

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through which were strings of lime carbonate. Within it were "bunches," or a band, of argentiferous galena. Found at a depth of fifteen feet, one sample of ore (probably nearly pure galena) contained 85 percent lead and 15 ounces of silver per ton.

Pure-picked galena. which we collected in 1962 from the dumps, were subjected to fire assay in the U.S.G.S. laboratory, and were found to contain 300 ppm silver, or 8.75 ounces per ton. This data confirms that the lead ore is a silver-lead ore. If mined in the U.S. West, the galena ore would be considered good grade silver-lead ore.

The vein containing the argentiferous galena was in a N45°E to N 52°E-trending vein which sloped very steeply toward the southeast. Large masses of concentrated ore were hoisted from the bottom of the 38-foot shaft, where work probably ceased because too much water was entering the mine. About 50 feet southwest of this shaft across the road, Dickeson 's crew dug a prospect pit on the main vein. The vein was 12 inches wide and produced about a ton of galena ore at a depth of 6 feet. Water inflow prevented deeper prospecting. This prospect had long been filled in when we visited the area in 1930. About 30 feet northwest of the main vein, Dickeson's crew sank another shaft to open a second vein. He also opened a northwest-trending crosscut to this vein, which he called the Dickeson vein, at about 15 feet from the surface, and said that this parallel vein, which was 7 feet wide, contained 4 feet of galena. Lumps weighing 50 pounds were mined. He continued prospecting to the northeast and southwest of the main shaft area for more than a mile, in order to prove that the veins continued for at least 1000 feet along the strike. He concluded that the property showed great promise, but he was unable to successfully promote the property to production (Dickeson, 1860a, p. 9). He produced perhaps 50-100 tons of galena.

In 1861, Jacob and George Neimeyer bought the property and began an active prospecting and mining effort (Miller, 1920, p. 17-18; Annear, 1862). They found several new veins by widespread prospecting, including lead ore, and dug an open pit of northeastward trend on the vein, and a shaft near the north end of the 256-foot pit. The shaft became the engine, or pump shaft. It was eventually deepened to 167 feet. A drift was dug northwestward from the south end of the lead furnace to the west, or Dickeson vein, cutting it where it contained good ore. "Ore," by the way, as used in the 1860's, meant concentrates probably collected by hand sorting. In the period that the Neimeyers worked (1861-1862), they produced between 186 and 200 short tons of sorted galena concentrate, which contained 76 percent lead and 7 1/4 ounces of silver per ton.

A specimen of pure galena collected at the mine by geologist Harry Klemic, in the 1950's, was analyzed carefully. It contained 82 percent lead, 8.75 ounces per ton silver, .1700 percent uranium, .0370 percent vanadium, and .0037 percent antimony. This analysis shows that the small tonnage of lead-silver concentrates were reported quite accurately during the Neimeyer period of operation.

An interesting fact is that the tonnages and grades that were reported produced during this nineteenth century period are usually (though not always) accurate as to tonnage and grade produced, at least in the eastern United States. An example of a dubious analysis is one reported by Dickeson (1860, p. 5), where he states that he struck galena at a depth of 5 feet down to 15 feet that "gave 85 percent of lead and 15 ounces of silver to the ton." This Dickeson report indicates that the quantity of silver in the ore probably has been doubled from the actual amount, and that the lead reported in the ore has been raised from the quantity of lead to be expected from ore concentrated to that of chemically pure galena. These results suggest deception on Dickeson's part.

An abundance of prospecting, as well as some production, was done by the Neimeyers. They made a sizeable open pit in the small discovery outcrop, which was 266 feet long and nearly 80 feet wide. The north part of this pit was still open in the 1930-1970 period, but the south part and the Dickeson shaft were refilled with waste dump material by the time of my first visit in 1930.

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PART I; 1930-1962

The remaining pit was full of water. This pit, as well as the shaft in the north-central part, were probably the area from which most of the galena was obtained. The sphalerite and minor copper were thrown away with the waste rock. Zinc, in the form of zinc oxide and metallic zinc, was being successfully made from oxidized ores from Friedensville, Lehigh County, Pa., by Joseph Wharton, around 1860, using the Wetherill grate process. It is probable that the Pennsylvania and Lehigh Zinc Company was not accepting any custom "ores" at this time.

The Neimeyers put in shafts and pits south of the Old Limekiln Road, father south, behind the main house, and at least 700 feet farther southwest. We visited the dumps of one of these small shafts in 1962, finding good samples of galena and sphalerite, as well as angular fragments of fresh diabase. The diabase indicated that they cut a small dike of this rock along with the vein ore, which was on trend of the veins found to the northeast. Figure 1 (p. 6) also shows lead in the southeast corner of the Neimeyer field, northeast of the farmhouses and next to the west end of the bridge of Old Limekiln Road on its way northwest to the village of New Galena. Looking at this 1863 map, the section shows some other galena occurrences east of Neshaminy Creek, but these may be artistic license, or, quite possibly, areas where the Niemeyers had found float galena. It is of interest that the shows of ore on Figure 1, in the open pit and shaft, fit almost perfectly the shows of veins and ore in the Dickeson (1860), Annear (1862), and Ashmore (1863) printed descriptions. Thus, some of the outlying occurrences illustrated may also be real, and fairly accurately located.

The Ashmore (1863) geological report, and the accompanying map (Figure 1, p. 6), are unusually accurate for this type of effort. The result suggests that the entire area, from the creek to the southeast property boundary, may have several parallel veins, or groups of veins, besides the prospected ones, which could be, equally, lead, silver, and zinc-bearing. The property never got a modern late-20th century play, and the World War II U.S. Bureau of Mines prospecting effort was so poorly executed to be of no value. I knew Ken Earl, the mining engineer, a nice person, but unfortunately known elsewhere in Pennsylvania for efforts poorly planned and executed (P.E. Hotz, p.c., 1949), at localities such as the Perkiomen-Ecton Mines in Montgomery County and the Almedia Mine in Columbia County.

Robert C. Smith II's report (1977, p. 238-245) on the New Galena Mine is full of useful facts. If at some time in the future the reservoir is drained, and an economic geologist working for a good company examines the property, he may realize that this outcrop-poor area needs a proper exploration program to see if it contains many million dollars of lead, zinc, and silver which might be profitably mined, perhaps as a big low-grade operation. My friend, Paul Herbert, exploration chief of Goldfields American, declared it an excellent prospect, but could not sell it to the company.

Specimens of minerals collected here before the reservoir flooding indicate that while many of the minerals collected from this locality in the days of the mining may have exhibited fine crystals, only small micromount-size crystals in vugs are found in those more recently collected. These include all of the species listed by Smith (1977, p. 239), plus a few more which will be described in the second part of this paper.

Here is a Wheatley-Ecton type of deposit which was never visited by many of the old-time collectors because it was away from the main areas of collecting, except for Vanartsdalen's Quarry, in nearby Langhorne.

Author's Note: References will appear with Part II of this article.

VISITS TO THE NEW GALENA, BUCKS CO., PA., LEAD AND ZINC MINES

PART I: 1930-1962

Figure I: New Galena central mine workings in 1863 (Ashmore, 1863, Smith, 1977). The layout looked very similar,before flooding a hundred years later.