THE HISTORY OF THE FRIEDENSVILLE MINING DISTRICT
AND THE BIRTH OF THE U. S. ZINC INDUSTRY

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AIME 150TH Anniversary, Bethlehem, PA - October 3, 2021
ZINC MINES AND SMELTERS, 1850-1890

(Modified from Bleiwas and DiFrancesco, 2010)
Theodore Roepper identified the Zinc minerals on Ueberroth Farm
He became Lehigh Univ. Professor of Geology and Mineralogy

(Wittman, 1847; Smith, 1977)
SAMUEL WETHERILL
1853 WETHERILL AND GILBERT ZINC WORKS, SOUTH BETHLEHEM, PA
FIRST U.S. LARGE SCALE ZINC OXIDE PRODUCTION

JOSEPH WHARTON
1854 PHILADELPHIA INVESTORS SEND WHARTON TO TAKE OVER MINES & WHETERILL’S OXIDE PLANT
FIRST U. S. METALLIC ZINC SMELTER (1860-1863)
1853 WETHERILL AND GILBERT ZINC WORKS, SOUTH BETHLEHEM, PA

WETHERILL PROCESS: WETHERILL’S OXIDE FURNACE PATENT
SAMUEL T. JONES’ BAG HOUSE PATENT

PENNSYLVANIA AND LEHIGH ZINC COMPANY (PLZC) OPERATES THE FRIEDENSVILLE MINES, CONTRACTS WITH WETHERILL FOR OXIDE (Henry, 1860)
1854 PHILADELPHIA QUAKER PLZC INVESTORS TAKE OVER

1860 JOSEPH WHARTON DEVELOPS THE ZINC SMELTER

(1885 Sanborn Insurance Map)
THE FRIEDENSVILLE MINES, 1853-1893

Pennsylvania and Lehigh Zinc Co. &
Lehigh Zinc Co. (1853-1876/1881)
  Ueberroth Mine
  Old Hartman Mine
  Three Cornered Lot Mine
  New Hartman Mine

Passaic Zinc Co. (1853-1875)
  Correll Mine

Bergen Point Zinc Co. (1875-1881)
  Correll Mine

Friedensville Zinc Co. (1881-1893)
  All Mines

(Miller, 1924, Figure 4)
UEBERROTH MINE (1853-1891)

Vertical “Veins” in Dolomite and Limestone

Initial Mining in the Surface Pit

Underground Workings Followed the Veins

WATER BECAME A HUGE PROBLEM

Metal Works, 1888

Cornish Engine, Pumps and Boilers, 1872

Hoist and Incline

Mine Office and Storeroom

(Miller, 1924, Figure 5)
“THE PRESIDENT” CORNISH BEAM ENGINE AT THE UEBERROTH, 1872

PUMPING-ENGINE OF THE LEHIGH ZINC COMPANY, PENNSYLVANIA. (See page 504)

(Scientific American Supplement, 5 August, 1876)
ALL MINES CLOSE BY 1893 – 1899 NJ ZINC ACQUIRES PROPERTY

NEW HARTMAN MINE DURING NJ ZINC EXPLORATION, 1916-17
THE REBIRTH OF FRIEDENSVILLE

1945  NJ ZINC DECISION TO DEVELOP THE FRIEDENSVILLE MINE

1947-1952  SHAFT SINKING (1261 FEET), 3 PUMP STATIONS

1958  MINE PRODUCTION BEGINS

1966  GULF AND WESTERN, INC. ACQUIRES NJ ZINC

1970-1974  SHAFT DEEPPENED (2072 FEET), PUMPS ADDED

SEPTEMBER 18, 1983  FRIEDENSVILLE MINE CLOSES BECAUSE OF DEPRESSED ZINC PRICES AND HIGH OPERATION COSTS

1984  STABLER LAND COMPANY ACQUIRES NJ ZINC PROPERTY FOR REDEVELOPMENT (1680 ACRES)

2012  STABLER DONATES REMAINING LAND TO LEHIGH UNIVERSITY

REDEVELOPMENT CONTINUES BY LEHIGH
NJZ FRIEDENSVILLE MINING METHOD

(Cross Section showing Proposed Mining System for Friedensville - Looking Easterly -)

(New Jersey Zinc Company, 1962)
NJZ FRIEDENSVILLE MINE UPPER LEVELS, 1962

New Hartman Workings, 1893

(New Jersey Zinc Company, 1962)
WATER WAS STILL A COSTLY PROBLEM

Three stages of pumps raised 35,000 gallons per minute up the shaft

Mining Engineer, Mayo Lanning, next to a water fissure (ca1954)

(Photo courtesy, Bob Lanning)
NJZ FRIEDENSVILLE MINE

(Clockwise) Mine and Mill, Scaling the Back from a “Giraffe,” Underground Pump Station, Loading Ore (Photos Courtesy Ken Cox, ca1976)
FRIEDENSVILLE PRODUCTION ESTIMATES

1853-1893 Period (Based on Miller, 1924; Smith, 1977)

Est. Total Production (All Mines): 800,000 tons ore
  Ueberroth Mine: 450,000 tons ore
  Old Hartman Mine: 200,000 tons ore
  Correll Mine: 100,000 tons ore
  Three Cornered Lot Mine: 50,000 tons ore

Average Ore Grade: 30% Zinc
Hand-Picked Sphalerite Grade: 45% Zinc

1958-1983 Period (Based on Metsger, 1973; Smith, 1977)

Friedensville Mine Capacity 2000-2200 tpd ore
Friedensville Mill Capacity 2500 tpd ore
Est. Total Ore Production (25 years): 14,000,000 tons
Est. Total Zinc Production: Over 900,000 tons
Ore Grade: 5.5-6.5% Zn
FRIEDENSVILLE MINES TODAY

(Google Earth Image 2013, annotations by author)
HISTORIC FRIEDENSVILLE VILLAGE

(Clockwise from Upper Left) Friedensville Church, ca1839; Ueberroth Mine Superintendent’s House, ca1840; David Hartman House, ca1870; and New Jersey Zinc Employee Housing, ca1950 (Kaas Photos, 2012)

DEMOLISHED, 2017
Recreating The President Engine
HOUSE OF THE PRESIDENT – THEN AND NOW

Photo – Connar (2018)
“Why Saving the Location is Important…..”

Preservation Status – 2021

• The existing President Engine House and the area surrounding the structure is a 19th century mining industry time capsule.
• Protection, preservation, interpretation and recognition of this engine house and its surroundings is of vital importance because:
  ➢ It is the only structure and physical setting remaining of one of the earliest industrial age enterprises in the Lehigh Valley;
  ➢ The engine house is part of the largest and most powerful single cylinder rotative steam engine ever built anywhere in the world;
  ➢ It is a unique structure as the only surviving example in the United States of a “house-built” Cornish-style pumping engine house, hence, an international extension of a UNESCO World Heritage Landscape.
  ➢ Long Historical Connection with Lehigh University, the property owner.
Preserving the Engine House

Lehigh University funding a study of the ruins with match funding provided by:

*Keystone Historic Preservation Grant (State of PA) – 2 Grants (2019 and 2020)*

*Louis J Appell, Jr. Preservation Fund for Central PA (National Trust)*

Contractors/Consultants:

Vegetation Removal - *Keystone Siteworks*

PM, 3D Scan, Pump Shaft Evaluation – *Borton Lawson*

Architectural Assessment – *Whitman, Requardt & Assoc.*

Engine House Structural Analysis and Construction Drawings – *Keast & Hood*

The only surviving example of a Cornish style Pumping Engine House in the United States
Challenge: Recreate the Engine as an operating machine in a virtual world

Meet the Artist:

Guy Janssen

- Resident of Schelle, Belgium
- Master’s Degree in Engineering Sciences from the Catholic University of Leuven (KU Leuven) and a Master’s Degree in Nuclear Engineering from the Polytechnic Institute Grenoble.
- Retired after long career with Tractebel.
- Fascination with steam and other foundational mechanical equipment has led to Guy’s hobby of modeling equipment.
- He has a well-developed series of stationary and marine steam engine animated models on YouTube starting with Savery, Newcomen, Boulton & Watt, others and now also The President:
  https://www.youtube.com/playlist?list=PLeaFkeA7JwX4cvb3B1mDDWYK0A9Vji81X

- Guy uses Blender 2.9x, which is a community-based open-source software, to create these animated models.
- He is currently experimenting with interactive modeling using the gaming functionality in Blender.
And the rest of the movie........
The President Pump Preservation Fund

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Community and Historical Societies:
Kelly Butterbaugh, Coopersburg, PA
Coopersburg PA Historical Society
Cornish American Heritage Society
Cornish Cousins of the SouthEast
Lehigh County Historical Society, Allentown, PA
Northampton County Historical Society, Easton, PA
South Bethlehem Historical Society, Bethlehem, PA
Upper Saucon Township

Libraries and Museums:
Allentown, PA Public Library
Bethlehem, PA Public Library
Department of the Interior Library, Washington DC
Easton, PA Public Library
Lafayette College, Special Collections, Easton, PA
Landis Valley Village and Farm Museum, Lancaster, PA
Lehigh University, Special Collections, Bethlehem, PA
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National Canal Museum, Easton, PA
National Museum of Industrial History, Bethlehem, PA
Swarthmore College, Swarthmore, PA, Quaker Archives
Upper Saucon Township Library
USGS Library, Reston, VA

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Mike’s Paper on the Friedensville Mines……

The History of Zinc Mining in Friedensville Pennsylvania,” L. M. Kaas,  
Download:  

And Visit Us and View the Movie At……  
www.friedensvilleminesheritage.org

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