

# *5<sup>th</sup> Street Cemetery Necrogeographical Study*

Jenifer Junior High School ▪ Lewiston High School ▪ Lewiston ID

## *Embalming Arsenic & Soil Leaching Survey Pioneer Park*



**Abstract:** Far from their peaceful appearance, cemeteries can harbor several contagions, quite aside from the biological terrors that concern pulp fiction writers.<sup>1</sup> Embalming practices in the latter half of the 19<sup>th</sup> century regularly included the widespread use of an arsenic trioxide solution (arsenous acid) of varying strengths depending on the expertise and preference of the embalmer.<sup>2</sup> This proposal seeks permission for and outlines the procedures to conduct selective soil surveys with extraction probes in order to reliably evaluate for residual arsenic contamination as a result of more than 400 documented burials in the park between c. 1863 and 1889.<sup>3</sup>

**Rationale:** “As the containers [caskets] corrode, water moving downward through the soils of cemeteries can dissolve arsenic from the burials and move arsenic into the soil or ground-water. This slow spread of arsenic from numerous sources in an old cemetery can lead to serious environmental and health problems. To understand the potential impact, assume a hypothetical cemetery in a modest sized town. It is reasonable, for the period 1880 to 1910, to assume that 2,000 people died in that time period. If half of those were

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<sup>1</sup> Spongberg A.L. and Becks P.M. (2000) “Inorganic Soil Contamination from Cemetery Leachate.” *Water, Air, and Soil Pollution*. Volume 117, Number 1-4, pp. 313-327(15).

<sup>2</sup> *The ERA Formulary*. (1893) Detroit: D.O. Haynes & Company, pp. 321-322; Henley, Norman W. (1916) *Henley's Twentieth Century Formulas, Recipes and Processes*. Volume 2. *N.B.* Some contemporary recipes called for as much as 12 pounds of arsenic per corpse. Arsenic was preferred because large doses controlled bacteria and postponed putrefaction.

<sup>3</sup> See the 5<sup>th</sup> Street Cemetery Necrogeographical Study’s portal for a comprehensive discussion of the site of the proposed tests in this document. [online] [www.lewiston.k12.id.us/staff/sbranting/5thcem/5thcem.htm](http://www.lewiston.k12.id.us/staff/sbranting/5thcem/5thcem.htm)

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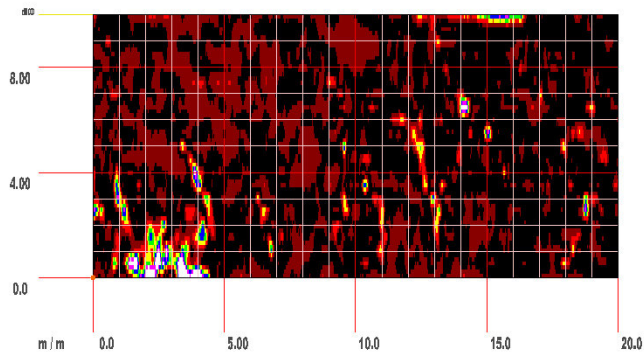
embalmed with arsenic, using six ounces of fluid per person, the cemetery contains 380 pounds of arsenic. If the embalmers in the area used more arsenic, such as three pounds per person, then the cemetery would contain over one ton of arsenic. In either case, this is a significant amount of a potent, toxic material to find in the ground at one location.”<sup>4</sup>

**Arsenic Morbidity:** Arsenic sickens and/or kills by a process known as “allosteric inhibition.” Essential metabolic enzymes are blocked, and the victim suffers multi-system organ failure. States successively banned arsenic for use in embalming after 1901. Many embalmers were dying from overexposure.<sup>5</sup>

## Project Site (center):

W 117.0252 N 46.4182  
(in RPL 03400810101A)

*N.B.* The original Masonic Cemetery was located at the Carnegie Building site and extended throughout the lot. This parcel is at the north end of the park. At least three (3) soil cores should be obtained, given the use of the building as a child care center.



## Preliminary Budget: (sources and amounts)

Lewiston School District, Gifted Program:	\$200.00
Industrial Test Systems, Inc.	donation of test kits

## Recommended Survey Windows:

**Sampling:** June 10-11, 2008  
**Lab Tests:** June 12-13, 2008  
**Reporting:** June 16-20, 2008

**Field Protocols (simplified):** Using ground-penetrating radar scans of vital areas of Pioneer Park, as produced in conjunction with the Natural Resources Conservation Service in October 2004, the field team will sink 25-30 test probes to capture soil samples at several depths, aside from 3 probes at a control site distant from the original cemetery

<sup>4</sup> Konefes, John L. and McGee, Michael K. (1996) “Old Cemeteries, Arsenic & Health Safety.” *Cultural Resources Management*. National Park Service. Volume 9, Number 10, pp. 15-18.

<sup>5</sup> Meyers, Maureen; Borstel, Christopher L.; Breetzke, David; and Holt, Henry. (1998) *Arsenic and Old Graves: Testing Procedures at Nineteenth-Century Cemeteries*. Paper presented at the Fall 1998 meeting of the Archaeological Society of Virginia.

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grounds but commensurate with the soil structure. Probing will require a limited *foot print* in the areas suspected of contamination.

**Field Protocols (amplified):** [to be determined and published after consultation with the Field Coordinator and Environmental Consultants]<sup>6</sup>

**Project Parameter Limitations:** The project discussed herein does not seek to excavate beyond the sinking of soil probes to obtain soil samples. No archaeological investigations will be conducted.

**Equipment:** Industrial Test Systems, Inc. features an array of Arsenic Quick™ tests that provide accurate results at affordable prices. Designed using cutting-edge chemistry, their kits report results in as few as 12 minutes. Recommended kit:

**Arsenic Quick™ Check      Part Number: 481396**  
**Detection Range:** 0, 5, 10, 20, 30, 40, 50, 60, 80, 100, 150, 200,  
250, 300, 400, 500, >500 ppm (µg/L)<sup>7</sup>

**INDUSTRIAL TEST SYSTEMS, INC.**  
1875 Langston Street, Rock Hill SC 29730  
(800) 861-9712

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<sup>6</sup> Borstel, Christopher L. and Niquette, Charles M. (2000) “*Testing Procedures for Historic Cemeteries.*” ACRA Edition. Lexington KY: Cultural Resources Analysts, Inc. Volume 6, Number 5.

<sup>7</sup> <http://www.sensafe.com/481396.php>

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## **Project Staff:**

### **Project Director:**

Steven D. Branting<sup>8</sup>

Gifted & Innovative Programs, Independent School District No. 1

### **Field Coordinator:**

Jon Munkers

TerraGraphics Environmental Engineering

### **City of Lewiston ID Liaison:**

Lynn Moss

Parks & Recreation Department

### **Environmental Quality Consultants:**

John L. Konefes

Iowa Waste Reduction Center, Cedar Falls IA

Tom Moore

Idaho Department of Environmental Quality

### **Attending Medical Officer:**

*To be named*

### **Surveying and GIS Coordinator:**

Ron Perkins

Idaho Department of Transportation

### **Faculty Representative / Laboratory Manager:**

Dr. Greg Thompson

Lewiston High School

### **Student Assistants:**

*To be named*

*To be named*

*To be named*

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<sup>8</sup> Branting, Steven. (2007) "Not Your Father's History Lesson." *Western Historical Quarterly*. Logan UT: Western Historical Association. XXXVIII, 2, pp. 205-213; (2006) "Resurrecting a Pioneer Cemetery." *Idaho Yesterdays*. Boise ID: Idaho State Historical Society. Volume 47, Number 1, pp. 28-45; (2008) "Digitizing a Heritage of Faded Memories — A Case Study on Extending Historical Research Capabilities." *The History Teacher*. Long Beach CA: Society of History Education. 40:4.