



Goya's Saturn (God of Lead)
Consuming his Child

Sublime Lead:

**The Biography of a 5000 Year
Toxic Love Affair**

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Dedication

To

Nancy Joy Babcock Fitch

And

Walter Stewart Fitch

In Honor of Your

55 Wedding Anniversary

Your interest in art and cultures (Mom) and science and the wilderness (Dad) encouraged my own wide range of interests.

Apologies and Acknowledgments

I apologize for topics which are unduly slanted towards the United States, and, in particular, to Chicago. I have tried, based upon the availability of published documents within the U.S., to represent historical developments and achievements throughout the entire world. There are many errors, I am sure, that are due, in part, to naivete, but others are due, in part, to the scarcity of material, and the inaccessibility of some of that material. With respect to modern environmental issues and chemistry I arbitrarily chose to focus entirely upon developments in the U.S.

The following people critiqued portions of the book. Any remaining errors in material do not reflect upon their expertise but upon myself. Paul Craddock of the British Museum gave a very preliminary critique of the historical information on metallurgy, Trisha Davis at the University of Washington gave initial comments on calmodulin type calcium regulators, Tom Granato at the Metropolitan Waste and Sanitary District of Chicago contributed some information on lead in waste management, Anne Grauer of the physical anthropology program at Loyola University Chicago gave me a crash course on archaeological bone material, and Walter Fitch (my father, the astronomer) trashed the initial and second versions of stellar reactions. Miss O'Reilly, art teacher at New Trier High School, brought metalpoint art to my attention. Mary K. Derr edited the book, however between editing portions of the book changed and any remaining errors are my own.

Thanks to undergraduate Steve Esposito for spending time with me at the Chicago Historical Society, the Newberry Library, and the Cook County clerk's office while working on a history of white lead production sites in Chicago. Thanks to all of those friends of mine who offered up new questions when I thought I was done (my Mom, Nancy Babcock Fitch, for example, for the question: Why lead in wine capsules?). I need to thank my children, Erika and Adam Benson, for taking tours through the Chicago Art Museum to check out all available examples of leaded art; the Botti Stained Glass Workshop in Evanston, Ill., for tours, as well as the Barco Type foundry in Bensonville, Ill. for a tour of one of the last remaining type foundries. I need to thank my husband, Al. B. Benson, III. for patience with my lead obsession and a number of photos. A thank you is given to a graduate student, Dr. Luke Augustine, for several of the photos. I also need to thank my graduate students and colleagues at Loyola for allowing me time to put into this project. Thanks students Marion Adly, Azza Wagdy, and Kim Barone for editing the questions. Thanks to students who took three trial classes in "Lead and Humanity" for helping to identify sections of the book that were confusing.

The Author

Alanah Fitch was born in Tucson, Az. and obtained a B.A. in Anthropology from Antioch College. During her undergraduate studies she lived in a rural Mexican town where lead glazed pottery was produced. After her bachelor's degree she obtained an M.S. in Soil Fertility (University of Arizona) and a Ph.D. in Soil Chemistry (University of Illinois, Urbana-Champaign). These degrees were followed with postdoctorals in electrochemistry at the University of Wisconsin (Madison) and Northwestern University. She has been a member of the chemistry department at Loyola University Chicago since 1984 where she is currently Full Professor, an inaugural Loyola University Faculty Scholar, and a Master Teacher in the College of Arts and Sciences. Her research, funded by NSF, EPA, and Schlumberger Foundation, has resulted in 14 Ph.D. and M.S. dissertations and 55 publications. Topics include pollutant transport in clay films, electron-transfer events in cross linked hemoglobin, lead isotope measurements of European American migration in Frontier Illinois, and the design and development of a lead specific fluorescent reagent. She was recognized in a national competition by Anheuser Busch for her integration of environmental measurements into the teaching of instrumental analysis. She serves as an on-call resource for the American Chemical Society in the area of service learning in chemistry. She was the inaugural director of Loyola's Environmental Studies/Sciences Program which has a strong environmental policy core component.

Her interest in lead dates to 1992. This book is the outcome of that interest and was developed to teach a class cross-linked between the departments of Chemistry, Environmental Studies/Sciences, History, and Nursing. The class has been taught three times, the most recently, Fall 2002.

About This Book

I chose the subject of this book, lead and humanity, as a means to explore the relationship of science and society.

Because this book explores the relationship of science to society it is intended for both “society” and “scientists”. The book can be read as simply a collection of “stories” given in the words of the individuals involved in the stories or in their artwork. The stories are “strung” together as a larger meditation on the nature of “good” and “evil” in the use of science, in this case, lead. For those who want to know more about the chemistry underlying the stories ample detail is provided in the second half of each chapter. In this context the book can be used as a textbook on environmental decision making or on the relationship between society and chemistry. The book has evolved over three classes that I have taught on the subject. I started collecting information on lead (and artwork) in 1992 and began teaching an occasional class in 1998. The book has grown as I explored as many topics related to lead as I could. The book has been extensively rewritten with each class to create a more readable product.

It is my hope that those who read this book are awestruck both at the power of nature, the creativity of the human race, and are moved to wonder about long term policy issues related to science and technology.

Sublime Lead

The Biography of a 5000 Year Toxic Love Affair

CONTENTS

Chapter 1 Setting the Stage:	1
Introduction; Andrew Jackson; Part I: History, Art, and Technology of Lead Ores: Man Before Lead; Lead Before Man; Ore Formation; Plate Tectonics; Oxidation of Ores; Abundance and Isotope Ratios of Lead Ore Bodies; Part II: Atom Formation, Planetary Formation, and Ore Body Generation: Quantity; Planet Formation; Common Minerals; Dissolution and concentration; Sulfide Precipitation; Porous Matrix; Fingerprinting; Problems	
Chapter 2 The Introduction: Man Asks Lead Out (Mines and Mining) . . .	31
Part I: History, Art, and Technology of Ore Extraction and Processing: Found elements; Melting points; Coinage, Purifying the Elements (Cupellation); Historical descriptions of Cupellation; Fuel in General: Efficiency of Wood; Laurion, Rajasthan, Rio Tinto, England, Germany, Mexico, Bolivia and Peru; North America: Colonial; Galena, Tri-State; Leadville, Coeur d'Alene; Broken Hill, Australia. Part II: Iron and Mineral Solubility,Electrum and Amalgams, Archaeological Evidence, Dispersion, and Modern Metallurgy; Problems	
Chapter 3 Man Courts Lead: Metallurgy and Alloys	97
Part I: History, Art, and Technology of Metallurgy; Lead as Sculpture and Plastic; Projectiles, Shot Towers, Lead Weights; Lead Plumbing; Birth, Life, and Death Under Metallic Lead; Leaded Bronzes; Mexico, Nigeria, China; Why is Lead added to some kinds of bronze?; Brass; Description and Chemistry of Niello; Purification of Gold from Silver using Niello; Inadvertent Alloys: Metal Contamination and Implications for Recycling; Part II: Underlying Chemistry of Lead Metals and Alloys; Control of Gases; Lower Energy Requirement; Control of Final Solid Phase Structure; Trapping the Desired Structure by Controlling the Rate of Cooling; Extra Lead Prevents Dendritic Growth; An Example of Alloy Phase Control: The Making of Mirrors; Problems.	
Chapter 4 The Wedding (Glasses and Glazes)	149
Part I: Glasses and Glazes, History. Why Lead?; Desirable Properties of Leaded Glass; Ancient Leaded Glasses; Medieval and Modern glasses; Toxicity of Leaded Glasses; Stained Glass; Enamels; Diffusion of Glaze Technology; Chinese Lead Glaze: Early Historical Developments; Three-Color Glaze; Porcelain and Its Imitation: Lead/Tin Glaze; Spain and the Birth of Majolica; Lead Glazed Pottery in the U.S.; Lead Glazed Pottery in Mexico; Leaded Glaze Frits; Toxicity of Leaded Glazes; Part II, Why lead and Glass? Flux; Lead and flux; Lead and Ease of Handling; Lead and Opacifiers; Lead and Brilliance; Lead as Glass Solvent Enhancer; Modern Glasses; Chemistry of Lead Glass and Glaze Toxicity; Chemistry of Lead in Majolica: Surface Tension; Problems	

Chapter 5 Putting on the Ritz: Pigments	195
Part I: Pigments and Paints History; White; Leaded Paints and the Painter: Goya; The “Color” Black; The Color Yellow; Lead Tin I and II; Massicot; Chrome; Toxicity of Yellow Paints; Minium or Red Lead; Toxicity of Minium; Papermaking; Metal Point; Illuminated Manuscripts, Spitballs, Replacement Pigments. Other Uses of Lead in Paint: Drying Agent, Anticorrosion. Part II: Chemistry of Paint and Color. Perception of Color; White: Absence of Color; Making Ceruse; Color of Metals and Semiconductors; Black Galena; Charge Transfer Colors, Crystal Lattice Tuning of Color; Organic Replacements; Anticorrosion; Problems	
Chapter 6 The First Honeymoon: Alchemy and Mineral Acids	241
Part I Alchemy: The Purity and Religious Significance of Gold; Two Types of Knowledge; Decoding the Chemistry in Alchemy; The Days of the Week as Early Electrochemical Knowledge; Green Lion = Amalgamation; Saturn and the child as Solvation, Liquification, and Purification (Killing the Sun); The Four Aristotelian Elements; Alchemical Theory of Metals; The Alchemical Sequence (Phase and Color Changes); Alchemical Theory Conclusion; Part II. Alchemical Entrepreneurs and the Problem of Intellectual Property Rights; Alchemists and Control of Information; Metal Assays and the History of Mineral Acids; Part III. Alchemy and Lead as Medicine; Proto-Medicine; Paracelsus and the Beginnings of Modern Western Medicine; Homeopathy; Modern Toxic Folk Medicine; Part IV Chemistry of Metal Colors and Mineral Acids; Problems	
Chapter 7 The Second Honeymoon: Some Modern Uses of Lead	287
Part I: Modern Leaded Consumer Products. Pewter, Typecasting; Babbitt Metals and Lubricants; Solder, Tin Cans, Wine Capsules; Superman and Lead; Linoleum; Why Lead in Plastics?; Lead and the History of Fire Arms; Early History of Batteries; Lead Acid Batteries and Transportation; Why Lead in Gasoline: Replacements for Leaded Gasoline; Airborne Lead from Gasoline; Deposition to Ice Caps; Deposition to Lakes and Oceans; Deposition to Plants; Deposition to Soils; Part II Chemistry of Modern Lead Uses; Solder, Tin Can Rusting; Radiation Shields; Lead Acid Battery Technology; Combustion Engine Chemistry; Polymer Chemistry; Elementary Reactions in Gun Powder; Chemistry of Lead Azide; Part III Modern Industrial Uses of Lead; Catalyst for Methane Conversion; Lead Acetate Catalysts; Superconductors; Non-Linear Optical Materials; Quantum Dots; Problems	
Chapter 8 The Marriage Bed: The Physiological Relationship Between Lead and Humanity	359
Part I. Human Physiology. Organo-Lead Inhalation; Organo Lead Action on the Proton Pump; Lead Bullets Embedded; Inhalation of Particulate Lead; Lead Entry Through the Stomach; Fate After Ingestion: Blood; ALAD; Deposition to Hair; Deposition to Bones; Deposition to Placental Tissue; Deposition to Kidney; Renal Failure; The Kidney and Blood Volume; The Kidney and Gout; Gout and Bathing; Lead and the Brain; Calcium Implicated; Review of Lead Poisoning Symptoms; Calcium Functions; Lead as Calcium; Calcium Triggers in the Nervous System; Leadzyme; Synthetic Lead Fingers; Chelation Therapy; Part II Companion and Avian Species; Companion Animals; Livestock; Unusual Bird Poisoning, Wild Waterfowl; Raptors; Other; Part III Lead and Other Species (Plants); Lead in Soils; Natural Sources of Lead; Point Sources of Lead (Battery Recycling); Pigment Soil Lead; Fate of Lead in Soil; Uptake by Plants; Phytoremediation; Part IV Underlying Chemistry; Covalent Binding of Lead to Carbon; Chelation Therapy; Lone Pair effect;	

Soil Matrix; Localization in Soils; Mobility of Lead in Soils; **Problems**

Chapter 9 Suspicions: Historical Lead Poisoning 413

Part I: Lead and the Romans; High Production of Lead; High Use of Lead; Honey; Sugar; Sapa; Lead Poisoning Symptoms Well Described in the Literature; Death of the Aristocracy (Infertility); The Roman Bone Record; Archaeological Bone Record for Romans; **Part II Early Lead Warnings;** **Part III The Franklin Expedition;** The Historical Setting; Historical Reconstruction of Events; Lead Stands Accused; Lead and Tin Cans; High levels of lead in Sailors; Lead did not predate the trip; Amount of Lead high enough to affect events; Objections to Lead as a Causative Factor; **Part IV: Archaeological Bone Chemistry and Lead; Problems**

Chapter 10 Accusations: The Social Construction of Environmental Disease 447

Part I Occupational Disease (Feminized Science); The Eight Hour Work Day; Alice Hamilton and Feminized Science; Painters' Sickness vs. Lead Sickness; The Kehoe "Show Me" Rule; **Part II Analytical Chemistry and "Background";** Chisholm and Analytical Chemistry; Patterson and Background Contamination; The First Lead Paint Laws; Lead Absorption vs Lead Poisoning; **Part III The Birt of risk Assessment;** **Part IV Social Definition of Environmental Disease;** Needleman; Predicting the Effect of Regulation; Controlling the Face of the Debate; Management; Community Based Sampling (Democratized Science?); Remediation; Enforcement of Notification; The Predictable Lawsuits; A Case Example Coeur d'Alene; A Sad Ending for Dr. Chisholm; Environmental Racism; **Part V: Risk Assessment of Lead in Dust and Soils Chemistry;** correlation between soil/dust and blood lead; bioavailability of leaded dust and soil; **Part VI Costs of Remediation;** remediation and/or removal of contaminated soils; removal; barriers; soil washing; soil flushing; bioremediation; electroremediation; in-situ stabilization; leaded dust; Removal of lead from homes; removal to water; sewage; solid waste streams; landfilling; metals and waste incineration; metal emissions; reducing incinerator emissions; risk assessment of emissions; treatment of fly ash; Solidification and cementation; **Problems**

Chapter 11 Divorce: Finding a Good Lawyer: The Lead Industry under Siege 511

Part I: National Lead's Antecedents; Importing Our lead; The Lead Trust; Horizontal consolidation of White Lead Industry; Chicago and Small White Lead Producers; Escapees from National Lead; Philanthropy and Lead (Blatchford); Eagle-Picher; Carter White Lead; **Part II;** Interlude: Attempts to Fully Integrate the Lead Industries; Other Lead Consuming Industries; Lead Acid Batteries (Beginning); Transportation Franchises; The Electric Vehicle Company; How the Guggenheims Won; 1892-1907 (Close but no cigar); Electric Storage Battery Survives; **Part III The National Lead Story;** 1920-1965 Diversification; titanium dioxide; 1978-2002 (Divestment and Risk Management); NL Industries and Taracorp; GNB Batteries; The Dutch Boy Factory; Philadelphia and National Lead; Snowballing Litigation; NL Industries Today; Other Types of Litigation; **Part IV The Rhode Island Lead Paint Nuisance Lawsuit of 2002.**

Example Problems 563

Appendix: Tables 599

- A. Summary Lead Data
- B. Geochemistry and Geology
- C. Soils, Water, and Plants
- D. Chemistry
- E. Archaeology and Art
- F. Material Science
- G. Dispersion and Risk Assessment
- H. Waste Disposal
- I. Industrial Production
- J. Time lines

References 669-727