Mining and Selling Radium and Uranium

Carnotite, $\text{K}_2(\text{UO}_2)_2(\text{VO}_4)_2$, the American radium ore. From the Happy Jack mine in Utah. Public Domain. Courtesy of the US Geological Survey

Roger F. Robison

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Roger F. Robison
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*This book is dedicated to four superb
historians, whose writings never fail to
educate as well as entertain.*

Ed Landa: geologist

Jim Marshall: chemist

Joel Lubenau: health physicist

Richard Mould: radiation physicist

Foreword

Human progress was dramatically and forever altered after the Curie's discovery of radium near the end of the nineteenth century. Fascinating lore revolving around that auspicious event and the subsequent use and misuse of radium as a medical treatment, and for other less noble purposes, is relatively well known. However, the complete radium story is much larger, antedating the isolation of radioactive element itself, and with ramifications that are felt even today.

We are grateful to the author for exposing this lesson-rich history in a single accessible volume. The scholarship involved is remarkable for its depth and completeness. Many scientific and commercial pursuits have been cross-cut as shown in this complete chronicle of radium. Anyone with professional or personal interest in radium, its origins and use, radioactivity and related topics, or a general interest in the history of science will enjoy exploring this book. Some may even find it difficult to put down without reading it through.

14 July 2014

J. Frank Wilson
MD, FACR, FASTRO

Preface

This book brings together reports from multiple scientific disciplines to produce a comprehensive history of the radium and uranium industries of the twentieth century and their effect on world events. Whereas much has been written about the utilization of uranium to produce atomic bombs, this narrative is concerned with the mining of uranium and its byproducts during the centuries before and the decades after August of 1945. It begins with the discovery of pitchblende and the appearance of Miner's Plague in the mid-sixteenth century and ends with the political and diplomatic events of 1990. The initial status of uranium as a periodic table curiosity and its minor commercial role in ceramics is described. The discovery of ionizing roentgen rays and radioactivity is seen to pave the way for the discovery of radium and radon, both of which had enormous commercial value. The creation of a radium market and the origins of radiation oncology during the inter-War period are detailed.

The sequential radium monopolies of Austria, Colorado and Belgium are examined as is their role in the procurement of uranium during World War II. The scientific work of the German scientists who identified the etiology of Miner's Plague while they overlooked the world's second largest uranium source is explained. The origins of the Cold War are traced to the Soviet obsession to procure enough uranium to achieve nuclear parity. This preoccupation alienated their G.D.R. and CZ satellites while helping to bankrupt the U.S.S.R. Documented are the combined efforts of the United States Public Health Service, Nuclear Regulatory Commission and the Environmental Protection Agency to finally gain control in 1990 over the toxicities of American uranium mining and radium products.

Contents

1 Reich Thalers and Pechblende.....	1
1.1 Holy Roman Empire (Heiliges Römisches Reich).....	1
1.2 Czech Bohemia Resists	6
1.3 Schlick Silver Mint	9
1.4 Battle of Mohacs	15
1.5 Pechblende	18
1.6 Religious War	19
References	23
 2 Ionizing X-rays	 27
2.1 Luminescence.....	27
2.2 Fluorescence.....	29
2.3 Discovery	32
2.4 Post-discovery Reports.....	35
2.5 Ionizing Radiation.....	42
2.6 Haarausfall and Therapy	44
2.7 Supplemental Material: Partial List of Röntgen Awards and Honors	52
References	53
 3 Radioactive Rocks	 57
3.1 Becquerel Rays.....	57
3.2 Klaproth.....	58
3.3 Marie and Pierre.....	61
3.4 Widowed at 38.....	70
3.5 Rutherford	74
3.6 Supplemental Material: Parisian Chemists at the Time of the Curies	79
References	80

4	European Radium Sales	83
4.1	Radium Factories	83
4.2	Curie-Therapy	98
	References	105
5	Colorado Uranium	109
5.1	Mexican Cession	109
5.2	Colorado Minerals	114
5.3	Colorado Plateau	120
5.4	Carnotite Mineral Belt	125
	References	129
6	US Radium and Uranium Sales	133
6.1	American Vanadium Company	133
6.2	Standard Chemical Company	137
6.3	The Denver and Canonsburg Legacies	145
6.4	The Uravan Mineral Belt	149
6.5	US Radium Corporation	152
6.6	Radium Chemical Company	155
	References	157
7	US Radium Oncology	161
7.1	Cancer Care in the Nineteenth Century	161
7.2	New York Cancer Hospital	164
7.3	Professor James Douglas	166
7.4	National Radium Institute	170
7.5	Dr. H. A. Kelly Hospital	173
7.6	Janeway and Tele-Gamma Therapy	180
	References	183
8	Congo and Arctic Uranium Sales	187
8.1	Belgium Radium Monopoly	187
8.2	Eldorado Gold Mining Company	190
8.3	Uranium Supplies	194
8.4	Boris Pregel	200
8.5	Congo Crisis	205
	References	206
9	Miner's Plague	209
9.1	Agricola	209
9.2	Miner's Medical Maladies	214
9.3	Radon	217
9.4	Schneeberg Lung Disease	219

9.5	Third Reich Occupational Medicine	222
9.6	Supplemental Material: Classic German Studies on the Radon Hazard: 1879–1939.....	226
	References	227
10	Cold War Uranium Blunders.....	229
10.1	Dr. W. C. Hueper	229
10.2	Murray Hill Survey	231
10.3	Jachymov Ignored	233
10.4	Partition of Germany.....	237
10.5	The Soviet Bonanza	239
10.6	American Wismut.....	244
10.7	End Note.....	248
	References	250
	Appendices.....	253
	Appendix I: Periodic Table	253
	Appendix II: Radiation Therapy Trials: 1900–1909	254
	Appendix III: Uranium Minerals: Tested by Marie Curie and Used by European Factories.....	256
	Appendix IV: Radioactive Decay Tables: Unstable to Stable	257
	Appendix V: Uranium Decay Emissions	258
	Appendix VI: Beta and Gamma Decay Emissions	258
	Appendix VII: Price of Radium, in US Dollars	259
	References	260
	Index.....	261

About the Author

Roger Frank Robison AB, MD FACP, FACR The author grew up in Indiana and Chicago. His family consisted of four generations of optometrists after his grandfather graduated from a 6 week correspondence school in 1907. Robison majored in chemistry at Indiana University in Bloomington. After graduation in 1958, he married Tiiu Raun, the daughter of a linguistics professor at the University and the Air Force language school. The Rauns had escaped Estonia in September of 1944 on a German troop ship, hours ahead of the Red Army. After graduation from Albany NY Medical College in 1963, the author served in the US Public Health Service. Dr. Robison trained in oncology at the Long Beach V.A. Hospital in CA and worked as a G.P. and an Internist at Kaiser Permanente before and after residency training.

Robison practiced oncology and taught at the Indiana University satellite medical school in Bloomington during 1970–1977. He trained in radiation oncology at M.D. Anderson Hospital in Houston during 1978–1980 under director Dr. G.H. Fletcher. Radium was then still the mainstay in the successful treatment of several cancers. Dr. Fletcher had graduated in 1941 from medical school in Belgium, where the school was amply supplied with Congo radium for brachytherapy and tele-gamma machines. In 1950 Fletcher and his physicist, L.G. Grimmett, published the first design for tele-cobalt (substitute radium) machines, which were later produced in Canada.

While practicing radiation oncology in Terre Haute and Vincennes IN, the author remained active with the MD Anderson-Fletcher Society and published articles on the radium business, tele-gamma machines, and early therapists H.A. Kelly, L. Wickham and M. Cleaves. Dr. Robison was invited to write a monograph on the history of megavoltage radiation therapy for *Acta Oncology* in 1995, the centennial for Roentgen's discovery. He served on the History Committee of the American Society of Therapeutic Radiology Oncology for ten years and in 2008 co-authored the fifty year history of the organization and the development of therapy as a separate specialty. During the research for that publication, the author came across so much intriguing material that he was encouraged by his mentor, historian Robert Ferrell, to put it into this book.