REDISCOVERY OF THE ELEMENTS — BACKGROUND AND SCOPE

"Rediscovery of the Elements" has been a team project of Jim and Jenny Marshall since 1998. Because modern science evolved in Europe and the vast majority of the elements were discovered here, this project involved many summer-long trips to two dozen European countries.

The timing of this work — starting at the end of the twentieth century — was fortunate. There were four reasons why this project could now be completed in a reasonable duration of time. First, the Iron Curtain had lifted; with the fall of the Berlin Wall in 1989 and the following opening of eastern Europe, easy access and travel was now possible to a major portion of Eastern Europe, including Russia. Second, internet communication now made possible facile communication; previously ordinary mail had necessitated weeks, months, and even years for queries and replies, but now efficient schedules and appointments could be set up for a profitable and full summer's study at many sites in Europe. Third, digital cameras had just arrived on the market; the first camera used by the authors was a Sony Mavica, with beautiful optics (but with 1-MByte floppy disks!) that allowed hundreds of photographs to be taken at reasonable cost. Fourth, GPS navigation allowed accurate measurement of geographic locations and map-making, and later Google Earth (appearing in 2005) could confirm earlier recordings made on the ground by rail, car, ship, or foot.

Although Europe was the main source of information for this project, much was also done in North and South America, and these geographical areas are included as well. Africa and Asia, which are just as rich in mineral resources, were not involved in this study, because the authors confined themselves to the actual sites where the elements were first identified and characterized in the historical chemical narrative.

The major portion of "Rediscovery of the Elements" is comprised of ca. 6500 selected jpg images (from a base of 25,000 photographs taken by the authors) of the discovery sites, with a running narrative as one "rediscovers" each. These sites included the mines and quarries where the original minerals were procured; original sites of the universities and homes where the laboratories were located (sometimes still existing, sometimes not); modern museums which today house historic specimens, documents, laboratory equipment, and other exhibits. The authors additionally prepared, in collaboration with Garmin™, over 354 detailed maps (20-meter resolution) showing one precisely how to locate each site. A complete table was also assembled (65-page pdf file) for easy referral which specifies each important site, its significance, and its location (address and GPS coordinates). Two auxiliary tables have also been developed: (a) one table detailing statues, monuments, etc., associated with discovery sites (19-page pdf file); and (b) another table detailing recommended museums useful to study of the elements (13-page pdf file).

As this project progressed, the authors also wrote 55 articles in the *HEXAGON of Alpha Chi Sigma* which detailed their travels, which are also included in "Rediscovery of the Elements."

To fill out the final project, biographies have been written and a “Historical Sketch of the Discoveries” (103-page pdf file) was added, which was taken and updated from an earlier publication of the authors, “Discovery of the Elements,” published in 2002.

Finally, photographs are included of each element in the authors' *complete* element collection in their home, as well as specimens of *each mineral* from which the elements were first characterized, from the *geographical original sources* (mines or quarries). This collection has been visited by Oliver Sacks, who made a special trip to Texas before his book *Uncle Tungsten* appeared.

As supplementary material, other instructional tools developed by the authors are included, *i.e.*, “History of the Periodic Table” (PowerPoint file).

The final grand opus has been recorded on DVD as a dynamic learning tool, with links provided to allow the reader to navigate easily among scientists, elements, photographs of discovery sites, and maps.

The cost of presenting all these photographs and articles in a book would be prohibitively expensive, which would encompass many volumes. Hence, “Rediscovery” has been presented on a DVD, available to the scholar, teacher, student, virtual or real traveler, and layman at reasonable cost. However, in addition to the development of this DVD, several multi-volume sets have also been prepared, to be delivered to the Library of Congress and other selected world sites. Another 5-volume set will be stored, as well as the original notes and records of the authors, at the University of North Texas Library Archives, available to future researchers.

REDISCOVERY OF THE ELEMENTS — 2nd EDITION (2018)

The authors (Jim and Jenny Marshall) intended to produce an updated edition to the original 2010 version (1st edition), but the sudden passing of Jenny (see the *Hexagon* Articles, Memoriam to Jenny Marshall) delayed this research. Finally, at this time (2018) this work has been finished, and includes the following changes and updates:

(1) Updates of maps, with corrections and additions.
(2) Additional information, tables, photos, maps. Although this added data deals with a number of places and elements, the primary large additions involved Skogsböle, Finland (tantalum) and Karlshus, Norway (helium).
(3) Addition of chemists.
(4) Inclusion of the elements, through number 118.
(5) Inclusion of all the *Hexagon* articles, which is now a complete set, covering all of the naturally occurring elements.
(6) General editing of typographical errors, syntax, etc.

Even though this update is almost a decade after the original work, it must be remembered that the photographs were not updated -- these were obtained during the original travel research during the period 1998-2010. These photographs were not of the modern resolution, but instead were taken with the "primitive" digital cameras of that era. Nevertheless, the optics and electronics of this first generation were outstanding. Also, this lower resolution actually has an advantage -- the entire "Rediscovery" package occupies only 1.2 Gigabytes.

We hope that you enjoy this completed work! It was a labor of love of both of us....

-- Jim and Jenny Marshall