

form of maps, are not to be scrutinized as would be justifiable in the case of surface surveys; for their design is not to fix the boundary lines of property, but merely to aid the imagination in following the courses pursued and the distances traversed in under-ground explorations. In the nature of the case, much obscurity must ever rest on regions shrouded in perpetual and absolute darkness, except as momentarily lighted up by artificial means; and the hope of the author is only that he may make certain points clear, and gather into one volume the winnowed results of long and varied research by others as well as himself. My collection of cave literature contains every thing of the kind that has been brought to my knowledge; including a considerable amount of material the value of which is impaired by flights of the fancy, or recklessness of exaggeration. Obligations to those whose publications have been of real service, are duly recognized in their proper place. I desire to make special acknowledgment of the personal attentions paid and the facilities for exploration furnished by the owners and managers of the principal American caverns described.

The illustrations of Mammoth, Sibert, and Wyandot caves were made under the author's direction, by Mr. J. Barton Smith, of New Haven, Conn., and were originally prepared for articles that appeared in *Scribner's Magazine* in 1880. The sketches were first done in black and white, by the light of from twenty to fifty lamps; after which the places sketched were brilliantly illuminated by magnesium, that a clearer view might be had of their outlines. The work thus begun underwent careful revision in the artist's studio, and was corrected as to minor details by comparison with photographs that had been previously taken. Several of the cuts of