A Chemical Edcation

by

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Uncle Tungsten
by Oliver Sacks
Alfred A. Knopf, New York 2001

Oliver Sacks is a physician, scientist, and author who has told stories of people coping with amazing neurological disabilities. In this book, he recounts his scientific boyhood in Britain during the period around World War II. He was born into a extensive and close knit family, wealthy and highly engrossed in science as both work and hobby. He focuses upon the traumas of his separation from family during the war, his fears of insanity, and the redemption achieved through throwing himself into scienctific studies. As he goes through his own scientific and personal life-story, he recounts both the family history and the history of the science of chemistry.

The early part of the book describes young Oliver's extensive and foolhardy chemical experiments. In a home basement laboratory, he acquaints himself with the properties of the different chemical elements by the classic process of mixing and boiling, exploding and burning, feeling and tasteing and smelling. He is aided and abetted by a supportive family, especially the uncles working in science and engineering. The "Uncle Tungsten" of the title created the firm which was the largest producer of incandescent bulbs in England, and which he runs as businessman, inventor, and scientist. He and his nephew are both particularly taken with the with the properties of metallic tungsten, used as filaments in light bulbs. This uncle provides encouragement for chemical investigations, metallic samples and chemical reagents, as well as scientific instruments. Supportive parents--they are both quite thoughtful physicians-- provide lab space, a very necessary fume hood, and an apparently inexhaustible patience. In this way, our young protagonist becomes acquainted with most of the chemical elements and many of their more dramatic chemical properties.

Oliver Sacks badly needs his world of chemistry. He finds much of his boyhood surroundings insupportably oppressive. During the bombing of London, the Sacks children were sent away to schools

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reflective of the worst that England can provide. They found sadism and loneliness and an awful feeling of abandonment. So when Oliver returns home, he throws himself into science to escape a world that he has found to be largely intolerable.

The climax comes between chapters 15 and 16 of *Uncle Tungsten* . At the end of chapter 15, Michael--the closest sibling-- becomes psychotic and delusional. Oliver believes this illness to be the result of their shared wartime experiences and thinks that he himself is going the same way. But then, chapter 16 opens and Oliver enters the Science Museum in South Kensington, London, which had been closed during the war. And there he sees, for the first time, the museum's giant periodic table covering a whole wall at the top of the stairs. He realizes at once that the table enables him to order and organize the knowledge gained in the basement lab and the factory visits. For the first time, Oliver Sacks was able to experience not only the richness and diversity of the chemical world, but also science's capacity for gving structure to the results of experience. For a young man, "at wit's end"; this organizing experience hit with all the force of being "born again". He says "Seeing the table, 'getting it', altered my life. .... It was real, a key to the universe."

So in 1945 Sacks extends his interest from the practical chemistry of the laboratory, to the books of the museum library. He begins to learn about the history of chemistry. From his first point of reference, Mendeleev and the periodic table, he reaches back to older organizing principles in chemistry, particularly to Danton's atomic theory. Indeed this autobiography recounts Sacks experience in learning the chemistry of 1945, but recounts this knowledge with his wisdom and experience of the year 2001. Thus, he can say of Sir Humphrey Davy (1778-1829) that "it was Davy's personality that appealed to me--.. with the exuberance and enthusiasm of a boy, with a wonderful adventurousness and sometime dangerous impulsiveness--he was always at the point of going too far--and it was this which captured my imagination above all". Of course, it is exactly these qualities in Sacks which make this book, and his other scientific studies, great and unique and unreproducible.

So readers, from practicing scientists to intellectually curious high-schoolers, can expect to appreciate the colorful life-story recounted, the interesting person revealed, the excellent history of chemistry retold. But please, dear parents, don't encourage your children to try the experiments, and don't think that this book provides a primer for raising young scientists.