visits by laymen and professionals alike. A tour includes interpretations by well-informed guides as well as a Swedish documentary film dealing with a small blast furnace shut down at the beginning of this century.

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WHATEVER HAPPENED TO THE MICROCRITH?

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Until quite recently, authors of introductory chemistry texts have always been careful to point out that atomic weights are relative rather than absolute and that they consequently have no units. However, the use of the words relative and absolute in this context is in some ways unfortunate. The intent was, presumably, to point out that, although the masses of atoms could be determined relative to one another by arbitrarily selecting a particular atom as a standard, their values in grams or in other conventional mass units was unknown or, at best, only approximate. The problem, of course, is that *all* conventional mass scales are in reality relative and involve comparison with an arbitrarily selected standard whose use depends on the twin virtues of reproducibility and convenient size. Thus, in practice, the only thing which distinguished the so-called relative atomic mass scale from the conventional metric scale was a failure to give the former unit an explicit name, and the so-called dichotomy of relative versus absolute resolves itself into one of determining an accurate conversion factor between the two units.

It was apparently not until 1961 and the adoption of the ^{12}C = 12 scale and the unified atomic mass unit (u) that chemists came to accept this point of view - apparently - because, in fact, a little-known atomic mass unit called the *microcrith* had actually been introduced into chemistry 90 years earlier and had enjoyed a brief, but limited, existence in American high school chemistry texts during the last quarter of the 19th century. The origins of this unit can, in turn, be traced back to an earlier unit called the *crith*, which was introduced into chemistry by the German chemist, August Wilhelm Hofmann (1818-1892), in the 1860's.

Though German-born and educated, Hofmann spent nearly two decades (1845-1864) as Professor of Chemistry at the Royal College of Chemistry in London. When he finally returned to Germany in 1865 to accept a position at the University of Berlin, his former students at the Royal College

August Wilhelm Hofmann

requested that he issue his famous course of lectures at the College in book form. Hofmann complied - at least in part. Deleting the later descriptive lectures, he published the first 12 introductory lectures, dealing with the theory of chemistry, in 1865 as a small volume entitled *Introduction to Modern Chemistry: Experimental and Theoretic* (2). This was quickly translated into German and, in this form, went through many subsequent editions and revisions (3).

As the word "modern" in the title suggests, Hofmann felt that chemistry had recently undergone a significant transformation, the most important components of which were the consistent and widespread use of Avogadro's hypothesis and gas densities to arrive at a self-consistent set of atomic and molecular weights and the emergence of the concept of valence. Indeed, it was in this very volume that Hofmann introduced the word valence into the chemical lexicon in the form of its longer variant - quantivalence (4).

The primacy of gas densities in the development of a self-consistent theory of chemical composition was emphasized by Hofmann throughout the book. Beginning with the volumetric decomposition and synthesis of the simple hydrides H_2O, NH_3 and HCl, the laws of chemical combination by volume were developed first. Combination by weight was then introduced via the use of gas densities. Selecting the density of hydrogen at STP as a standard, Hofmann assigned each element and compound a real or hypothetical (for nonvolatile species) relative "Volumgewichte" at STP which allowed him to translate the volume formulas and reaction equations developed earlier in the book into the corresponding weight or mass relations.

In order to facilitate the use of his relative "Volumgewichte"