THE METALS IN ELECTROCHEMISTRY

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About two thirds of the chemical elements recognized at present are metals. Of these seven, namely, copper, gold, iron, lead, mercury, silver and tin, have been known since prehistoric times. Antimony and bismuth were discovered by Basil Valentine in 1450; zinc by Paracelsus in 1520; and arsenic by Schroeder in 1694. In the latter half of the eighteenth century ten metals were discovered, namely, chromium 1797, cobalt 1773, manganese 1774, molybdenum 1782, nickel 1751, platinum 1741, tellurium 1782, titanium 1789, tungsten 1781 and uranium 1789. During the nineteenth century about forty-two new metals were discovered. Of these forty-two metals, about twenty-six were reported before 1850, and the remaining sixteen were recognized during the latter half of the century—fourteen of them being isolated before 1890.

\[1\] Presidential address at the meeting of the Electrochemical Society, Birmingham, Alabama, April 24, 1931.

Radium and lutecium were discovered in the twentieth century.

Thus most of our metals were discovered in the nineteenth century, particularly during the first half of that period, and during the three decades from 1860 to 1890. The reason for this lies mainly in the fact that electrolysis came into use with the electrolytic decomposition of water effected by Nicholson and Carlisle in 1800, and the introduction of practical spectroscopy by Bunsen and Kirchhoff in 1860. Electrolysis and spectroscopy, then, have greatly increased the number of metals (and also other elements) that we now know. Indeed, the finding of another new metal was so common during the nineteenth century that such discoveries almost became monotonous. To be sure new elements have also been found by purely chemical means; that is to say, without electrolysis or spectroscopy. Moreover, the
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