During the early 1960s, a great deal of experimental research was carried out on collision processes between electrons, atoms, ions, and molecules. Much of this work was inspired or supported by the expanding programs in space sciences, especially those related to the earth’s ionosphere. Most of the work that was done was aimed at using new, innovative, and exotic methods for making crude measurements on processes that were difficult to study. As a result, data began to accumulate on a wide variety of processes, but most of the data were very approximate. Furthermore, it was difficult to assess the possible errors in most of the data, and divergences between different investigators often greatly exceeded their assigned error bars. One of the main reasons for this was the prevailing preoccupation with crude excursions into unchartered territory. Our work represented a totally different attitude in that we aimed at building up a base of accurate data on related fundamental processes. Such a data base provided a reservoir of information for testing of theories, as well as a set of basic standards that could be used for normalizing other experiments to an absolute basis, thus accounting for the article’s frequent citation.

Very accurate measurements were made on a series of electron-impact ionization processes, which served as a data base for calibrating other experiments to an absolute base. ‘Consistency checks’ to indicate the validity of assumptions were emphasized. [The SCI® indicates that this paper has been cited over 370 times since 1965.]

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February 23, 1981

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