THE STATIC ATOM

I have been asked to present in this symposium the relation between atomic structure and the "valence bonds" by which the atoms are regarded as tied together, to form the more complicated structure of the molecule. Now the whole theory of molecular constitution which I have developed rests upon the fundamental postulate that the atom is internally at rest or nearly so. On the other hand, Bohr, who has given special attention to the phenomena of spectral series, has led to the view that the electrons in the atom are revolving rapidly about a central positive nucleus. Because of the wide acceptance by physicists of Bohr's theory of the atom and its orbital electrons, and especially in view of the very lucid arguments in favor of this theory which Professor Millikan has just presented to us, I am going to ask your permission to modify the subject of my paper, and to discuss not the specific methods of combination among the atoms, but rather the question as to whether the electrons in the atom and the molecule are in rapid motion or are essentially at rest; for upon our answer to this question any theory of molecular structure must depend.

Now assuming that the electron plays some kind of essential rôle in the linking together of the atoms within the molecule, and, as far as I am aware, no one conversant with the main facts of chemistry...

1 Presented at the symposium on "The Structure of Matter" at a joint meeting of the Sections of Physics and Chemistry of the American Association for the Advancement of Science, The American Physical Society and the American Chemical Society, New York, December 27, 1916.