C. INTERSTELLAR MOLECULES

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INTRODUCTORY REMARKS

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I would like to welcome everyone to the Joint Discussion on Interstellar Molecules. We are not entirely certain when our subject actually began. If the diffuse interstellar lines are of molecular origin, then it was born in 1920 when the first of the diffuse lines was recognized by Miss M. Heger. If not, then it began in the late 1930's with the detection of interstellar CH, CH^+, and CN by W. S. Adams. The optical study of interstellar molecules is limited to those having strong electronic transitions longward of 3000 Å, and consequently progress nearly halted after the detection of those first three, very abundant examples. Recently there has been a great new surge of activity in the microwave and radio regions, with the result that a total of 11 or 12 molecules have been detected to date. To these we probably have to add the still-mysterious carrier of the diffuse line spectrum. There is no reason to think that the list is complete. As our subject moves into the domain of organic chemistry, the question has been asked whether this proliferation of carbon-bearing molecules contains any implication of biological activity in space. (You will recall the jokes that have arisen from the unsuccessful search for interstellar formic acid by Cato *et al.*) There is, of course, no need to appeal to biological processes: the carbonaceous chondrites provide us with an excellent example of the resourcefulness of nature in the manufacture of highly-complex carbon-containing molecules under purely astronomical conditions.

Our program first reviews the systematics and the occurrence of all the interstellar molecules identified thus far. Next, there will be an extensive discussion of the competing ideas on the origins of these molecules. Lastly there will be a panel discussion, led by Dr Townes, on the mechanisms by which molecules can be excited under interstellar conditions.

De Jager (ed.), Highlights of Astronomy, 335.