The work described in the thesis is concerned with "The Study of Influence of Geomagnetic Field on Extensive Air Showers". An attempt is made to verify experimentally the idea of ellipticity of shower structures suggested by Cocconi.

In the first chapter a brief review of the present ideas about cosmic radiation is presented. The Nucleonic-cascade model of Extensive Air Showers is described qualitatively, right from the origin at the top of the atmosphere till the showers reach the surface of the earth including the lateral spread of showers.

In chapter II the experimental arrangement is described with the help of figures. A brief description of the necessary precautions that have been observed in the preparation of reliable counters with long plateau and similar characteristics is given. The electronic circuitry used in the experiments is also shown.

In chapter III Cocconi's prediction that the deflection of air shower particles in the earth's magnetic field should produce some ellipticity of shower structure, and his theoretical calculations of the geomagnetic effect are
presented. The experimental results obtained at Gulmarg (alt: 2710 m) while investigating this prediction are analysed and discussed. The results are also compared with those of Chaloupka, Dubinsky-Chaloupka, Norman and Nikolsky-Satsevich. The qualitative agreement of the results is pointed out. Some drawbacks of the experimental arrangement and the extent to which they affect the observed geomagnetic effect are discussed. It is concluded that the geomagnetic field has a significant influence on the lateral distribution of shower particles.

Chapter IV contains the experimental results collected at Aligarh (alt: 205 m). The discrepancy between the experimentally observed geomagnetic effect by several authors and the theoretically predicted value of Cocconi is pointed out. Oren's theoretical calculations for the influence of geomagnetic field on various components of Extensive Air showers: a) primary particles b) $\pi$-mesons c) $\mu$-mesons and d) their decay electrons are given. The results collected at Aligarh are compared with those of Oren at Haifa. The influence of altitude on the geomagnetic effect of Extensive Air Showers is also discussed.

In Chapter V the directional properties of shower detecting arrays are discussed. The significant differences
between the results of various authors regarding the directional efficiency of Extensive Air shower arrays are pointed out. Possibilities of further improving the performance of the device are also indicated.

The papers published on the work presented in the thesis are also attached in the end.

The results present in the thesis suggest, at least qualitatively, that the geomagnetic field has considerable influence on the lateral distribution of shower particles, and the ellipticity of shower structure is more than the theoretically predicted value of Cocconi.