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TECHNICAL REPORT

COHERER BIBLIOGRAPHY

by

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ABSTRACT

A bibliography on coherers and related fields, such as dielectric breakdown, semi-conductors, lightning arresters, and discharge in gases.

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Introduction

This bibliography includes reports, journal articles, and books on coherers and related topics. The coverage of related fields is not comprehensive, but only covers references which have some relationship to the study of coherer action. Patents are not included in this bibliography with the exception of a few early ones. For patents on coherers see U. S. Patent Office Class 250-32. Some patents utilizing coherers can also be found in Class 250-23. A few early patents may be in other classes. Before the word "coherer" became standard the term "fritter" was used by some workers.

The references are arranged chronologically by year of publication. Within each year they are arranged alphabetically by author. The material is subdivided as follows:

- I. Articles and Reports on Coherers - Coherer theory, experiments, and applications.
- II. Articles and Reports on Related Subjects.
 - A. Dielectric Breakdown - The breakdown of the oxide film appears to be similar to the electric breakdown of dielectrics. Although the oxides used in present coherers are usually semi-conductors, references on the dielectric breakdown of non-metallic solids such as (1) ionic crystals (NaCl, MgO) (2) valence crystals (diamond, carborundum) (3) semi-conductors (CaO, Cu₂O, ZnO) and (4) molecular crystals (solid organic compounds) are all included where the information may possibly be of some help in understanding coherer action.
 - B. Semi-conductors - Selected references on semi-conductor theory are included. Some of the metal oxides used in coherers are semi-conductors. The theory of the conductivity of semi-conductors may give some clues as to the voltage-current characteristics of coherers.
 - C. Lightning Arresters - The earliest coherer patent was for use as a lightning arrester. The early coherers used as lightning arresters are classified under "coherers" while the later applications using lead peroxide (anti-coherer) are listed in this section.
 - D. Discharge in Gases - The prebreakdown current in coherers and statistical variation of cohering voltage and time lag have some feature common to gas discharges so a few selected references are listed in this section.

- E. Miscellaneous Related Subjects - Material in related fields, such as contacts, test methods, spark gap generators, field emission, adsorbed gases, thermionic emission, formation of metallic bridges between contacts, oxidation of metal surfaces, arcing, and others having some relationship to coherer theory or design are included.

III. Books

- F. Books Containing Material on Coherers

- G. Books on Related Basic Phenomena

IV. IBM Coded Reports on Coherers and Related Subjects

Abbreviations

The standard abbreviations as used by Science Abstracts, Engineering Index, and other sources are used as far as possible. Earlier references have the volume and abstract number of the appropriate abstracting journal recorded for convenience in checking relatively inaccessible journals. The abstracting journals are abbreviated as follows:

Abst. Phys. Papers	Abstracts of Physical Papers in Foreign Languages, London, 1895 - .
ASTM, <u>56-G</u>	American Society for Testing Materials, Philadelphia. Special Technical Publication No. 56-G (1952)
Eng. Ind.	Engineering Index, N. Y.
Sci. Abst.	Science Abstracts, London, 1898 - later subdivided into Section A - Physics; Section B - Electrical Engineering.

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