CONFERENCE ON SOLAR ENERGY: THE SCIENTIFIC BASIS.

AT THE

UNIVERSITY OF ARIZONA, TUCSON.

1955 OCTOBER 31 AND NOVEMBER 1,

MONDAY AND TUESDAY.

MECHANICAL CONSTRUCTION AND THERMAL CHARACTERISTICS OF SOLAR OPERATED THERMOELECTRIC GENERATORS.

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SECTION C Business Administration Building ROOM 110

DAY Monday HOUR 2:15 p.m.

Research on solar operated thermo-electric generators at the Imperial College of Science and Technology, London, was commenced in 1953, the research being sponsored by Central Rediffusion Services Ltd.; Mr. Y. Klinger and Mr. D. P. Patel (2) assisted the author. The published researches by Dr. Telkes (1) on the zinc-antimony alloys were known, but it was decided to make a preliminary investigation of other systems. Alloys of selenium with copper and silver gave high thermo-electric powers, but the eletrical resistance was too great. Some results with cadmium-antimony alloys were promising, and a few samples showed an improvement on the zinc-antimony alloy, but the properties of different batches of alloys varied erratically, and facilities were not available at the time for a complete metallurgical investigation of the reasons for this variation. It was, therefore, decided to construct generators using the zinc-antimony alloys and the advice of Dr. Telkes on the preparation of these couples is gratefully acknowledged.

These thermo-electric generators were intended for accumulator charging, and low electrical resistance was a primary essential, consequently the elements were designed with a relatively large diameter and short length. The dimensions were based on the value of the current to be generated and the number of elements on the voltage required. An experimental unit was constructed having an absorbing area 12 inches square; this was not intended to give sufficient voltage to charge an accumulator, though it would supply the requisite current.