

LEAD INDUSTRIES ASSOCIATION

420 LEXINGTON AVENUE

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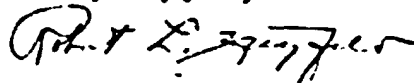
SUBJECT: SPECIAL CONDENSED REPORT
ON THE NINTH ANNUAL BATTERY AND
RESEARCH DEVELOPMENT CONFERENCE

To Members of the Lead Industries Association:

Attached is a special condensed report on the Ninth Annual Battery and Research Development Conference sponsored by the Signal Corps Engineering Laboratories. This report highlights the developments presented at the Conference that are of special significance to the members of the Lead Industries Association.

A more detailed and technical report was mailed to members of the Association on May 26, 1955.

Very truly yours,



Secretary



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The Power Sources Branch of the Signal Corps Engineering Laboratories at Fort Monmouth, N.J., annually sponsors a Battery Research and Development Conference. The purpose: to acquaint the battery industry with the progress of Signal Corps research and development programs in the battery field and to encourage exchange of information. The Association, as in the past, was invited to send a delegate to the Conference. Subjects discussed at the meeting of possible interest to members of the Lead Industries Association were nuclear batteries, nickel-cadmium batteries and zinc-silver oxide batteries.

Increasing interest in the nuclear or atomic battery field was evidenced by the number of papers devoted to the subject. The purpose of research in this unique field is to determine the practicality of utilizing radioactivity as a source of electrical energy. One system investigated used strontium 90 as a radiation source, another used tritium. Since the source of energy is beta radiation, shielding is minimized and in the case of tritium no lead shielding is required at all, inasmuch as tritium does not emit gamma radiation.

The consensus of all the investigators working on nuclear batteries would indicate that such batteries, at least in the present stage of development, are not a very practical and certainly not a competitive source of electricity. In fact, one of the speakers defined electricity generated by nuclear batteries as "radioelectricity" because "they generate a trivial amount of electricity." Further indication of the lack of practicality for nuclear batteries is the fact that to operate an ordinary flashlight, the tritium required would cost two hundred million dollars.

For the past several years work has been continuing on the nickel-cadmium battery which is developing into a dependable and competitive source of stored electricity. Many technical problems have been overcome and except for high cost the nickel-cadmium battery's performance is equal to that of the lead acid battery. The papers presented on this battery dealt primarily with research investigations on charge retention, development of a "dry charge" battery and study of plate characteristics. Of particular interest was the fact that rechargeable, hermetically sealed nickel-cadmium batteries are now being made in the United States. At present "D" and "F" size flashlight batteries are being made by Gould-National Batteries, Inc. They apparently exhibit good shelf life and will handle 50 percent of their rated capacity after one year. Their cost, however, which is about \$3 per flashlight type cell, prices them out of all but specialized markets.

Zinc-silver oxide batteries also have been given more attention with emphasis on developing suitable high rate batteries for special military systems. Particular emphasis is being placed on remote control activation of this type cell. The program is still in its embryonic stages. (Ed. At least at the present time, because of high cost, these batteries are not likely to find use outside of certain military applications and do not now appear to constitute a threat to lead acid batteries tonnage-wise.)

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More detailed abstracts of the papers presented at the Conference were mailed to the members of the Lead Industries Association and are available from the office of the Association.

The following is a complete list of all papers presented at the Conference. Copies of abstracts are available on request.

SOLEID ELECTROLYTE BATTERY	Sprague Electric Co., Dr. George Shinn
NEW ELECTROCHEMICAL SYSTEMS	Battelle Memorial Inst., L.D. McGraw
WATER ACTIVATED SYSTEMS	Eagle-Picher Co., E.M. Morse
FUEL CELLS	Pittsburgh Consolidation Coal Co. E. Orrin/H. Recht Aerojet General Corp., Dr. C.L. Randolph
BATTERY SEPARATORS	Polytechnic Inst. of Brooklyn, H.H. Bieber
NUCLEAR BATTERIES	Radiation Research Corp., J.H. Coleman Tracerlab, Inc., Alexander Thomas Ohsart Corp., Philip E. Ohsart
RADIATION CONVERTORS	Radio Corp. of America, E.G. Lindsey
SOLAR POWER SOURCES DEVICES	
THE BELL SOLAR BATTERY	Bell Telephone Labs., K.D. Smith
CdS PHOTOVOLTAIC CELL	Wright Air Development Center, D.C. Reynolds
NICKEL-CADMIUM SECONDARY BATTERIES	Sonotone Corp., Dr. G.A. Baumstark/M. Seiger Nickel-Cadmium Battery Corp., Dr. A. Fleisohc Gould-National Batteries, Inc., E. Willingham
ZINC-SILVER OXIDE SECONDARY BATTERIES	Eagle-Picher Co., J.S. Bone Yardney Electric Corp., Paul L. Howard
TEST METHODS	Signal Corps Engineering Laboratories, Dr. K. Kordesoh
SHELF LIFE STUDY OF THE LECLANCHE CELL	Naval Ordnance Lab., Dr. D.T. Ferrell
IMPROVEMENT IN STORAGEABILITY	General Dry Batteries, Inc., K.S. Willson
LOW TEMPERATURE BATTERIES	Signal Corps Engineering Labs., J. Murphy/ J. Lyons
I.P.S. PROGRAM ON THE DRY CELL (Industrial Preparedness Study)	Signal Corps Supply Agency, Robert J. John
HIGH RATE MERCURIC OXIDE BATTERIES	General Dry Batteries, Inc., K.S. Willson
MANGANESE DIOXIDE	Western Electrochemical Co., M.I. Prieto Tennessee Corp., F.E. Rowe