THESE PROCEEDINGS ARE DEDICATED TO THE MEMORIES OF

DR. RUDOLF BECHMANN
22 July 1902 - 28 November 1974

PROF. WALTER G. CADY
10 December 1874 - 9 December 1974

Dr. Rudolf Bechmann was born in Nuremberg, Germany. He received his Ph.D. in Theoretical Physics in 1927 from the University of Munich under Arnold Sommerfeld. His scientific career began thereafter with the Telefunken Company in Berlin where he investigated antennas and antenna systems. In 1932, he discovered the EMF method for calculating antenna characteristics. He then began work on piezoelectric crystals and in 1933 was one of the independent inventors of the AT-, BT-, CT-, and DT-cuts of quartz, continuing his work with Telefunken until 1945. From 1945 to 1948 he directed research at Oberspree Company; in 1948 he became principal scientific officer at the Post Office Research Station, Dollis Hill, London, where his work on water-soluble, highly piezoelectric crystals led to the publication of the book "Piezoelectricity" (Her Majesty's Stationery Office, 1957).

In 1953 Dr. Bechmann came to the United States to work at the Clevite Research Center, Cleveland, Ohio. Here he was active in the investigation of man-made quartz. He remained with Clevite until 1956 when moved to work in what is now the Electronics Technology & Devices Laboratory, US Army Electronics Command, Fort Monmouth, NJ. Dr. Bechmann was then

Dr. Walter Guyton Cady was born in Providence, R.I. He received a bachelor's degree from Brown University in 1895 and a master's in 1896. After teaching there for two years, he went to the University of Berlin, where he received his Ph.D. in Physics in 1900. Dr. Cady spent two years with the Coast and Geodetic Survey and joined the faculty of Wesleyan University, Middletown, Connecticut in 1902. He served as Associate Professor from 1903 to 1907, and as Professor from 1907 to 1946. During this time he did pioneering work in the area of piezoelectricity, and development of practical devices using the piezoelectric effect. He was one of the earliest workers in frequency selection and control and devised the first crystal-stabilizied circuit, as well as one of the earliest crystal-controlled oscillators.

Prof. Cady won the Morris Liebmann Memorial Prize of the IRE in 1928 and was its president in 1932. He was the second American to receive the Duddell Medal of the Physical Society of London. The award, in 1937, was for the quartz crystal clock, measurement and control of frequency and ultrasonic velocity measurements. Dr. Cady received honorary degrees from Brown University in 1938 and from Wesleyan in 1958.

chiefly concerned with developing resonators for filter applications, and with temperature-coefficients of doubly-rotated plates. During this time he was also contributing author to "Landolt-Bornstein," writing comprehensive sections relating to elastic, piezoelectric, dielectric, piezooptic, electrooptic and nonlinear elastic constants of piezoelectric crystals. Dr. Bechmann retired from Fort Monmouth in 1971 having written approximately 100 technical papers and having been issued 53 patents in Germany, England and the United States. He received the C. B. Sawyer Memorial Award in 1966, and was a fellow of the American Physical Society, the American Association for the Advancement of Science, the New York Academy of Science and of the Institute of Electrical and Electronics Engineers. In 1972 he was awarded the honorary degree of doctor of natural science by the University of Cologne, Germany.

As his publications have not been listed in print before, they are given below.

After retiring from Wesleyan in 1946 he became Emeritus Professor and Research Associate at the California Institute of Technology, where he continued his experiments. Also in 1946 his monumental book "Piezoelectricity" was published by McGraw-Hill; it has since been revised and a second edition was published by Dover in two volumes in 1964. It is the standard work in the field. Dr. Cady was still carrying on an active correspondence with colleagues when he passed away on the eve of his one hundredth birthday. A centennial lecture in his honor was delivered on 5 December by Dr. Warren P. Mason of the Bell Telephone Laboratories; this lecture appears in J. Acoust. Soc. Am., Vol. 57, April 1975, and may be consulted for further details of Dr. Cady's full and fruitful life. Professor Cady was a Fellow of the Physical Society (London), of the Institute of Electrical and Electronics Engineers, of the American Academy and of the Acoustical Society of America.

Published Works of R. Bechmann

A. Periodicals

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Correction, ibid., 9, 1928, 227

3) Production and investigation of noncrystalline piezoelectric materials. Jointly with A. Meissner.
Z. f. techn. Phys. 9, 1928, 430-434 (November)

4) Calculation of the radiation diagram of antenna combinations.
Telefunken-Ztg. 10, 1929, No. 53, 54-60 (December)

5) On the theory of radiation coupling of short wave antenna systems.
Ann. d. Phys. (V) 4, 1930, 829-862

6) Calculation of electric and magnetic field strength of any oscillating straight conductors.
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Correction, ibid., 19, 1931, 682

7) Computation of the ... liation characteristics and radiation resis... ice of antennas and antenna systems.
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12) On the ... ie dipole antenna.
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13) On the ... ation power along a dipol ...
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17) The crystal control of transmitters: Telefunken high-power broadcasting arrangements.
Wireless Eng. and Exp. Wireless 11, 1934, 249-253 (May)

18) On the temperature coefficients of the natural frequencies of piezoelectric quartz plates and bars.
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19) The measurement of the sound velocity in anisotropic media, especially in quartz, by piezoelectric excitation.
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20) Development of the quartz control of the large Telefunken transmitter. 2nd part.
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21) Investigations of the elastic resonance frequencies of piezoelectrically excited quartz plates.
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22) Quartz oscillatc
Telefunken-Ztg. 936, No. 72, 36-45 (March)

23) Quartz resonatoı
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24) On circuits for electric quartz oscillators and resonat or frequency stabilization and selecti
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25) Thickness vibrations of piezoelectrically excited crystal plates.
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26) Elastic vibrations of an anisotropic body in the form of a rectangular parallelepiped.
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27) Longitudinal vibrations of square quartz plates.
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33) Axial longit ıal vibrations of a straight bar of cryst .ne material. Together with V. Petržilka
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36) Piezoelectric resonator of ethylene diamine tartrate with zero temperature coefficient of frequency.
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45) Elastic and piezoelectric coefficients of lithium sulphate monohydrate.
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62) Variation with temperature of quartz resonator characteristics.
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63) Elastic, piezoelectric and dielectric constants of polarized barium titanate ceramics and some applications of the piezoelectric equations
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72) Effect of initial stress in vibrating quartz plates. In co-operation with A. D. Ballato
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74) Excitation of piezoelectric plates by use of a parallel field with particular reference to thickness modes of quartz.
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89) Vibrating crystals for circuits. Archiv der elektr. Übertragung 18, 1964, 129-136 (February)

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B. Books and Contributions to Books

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2) Piezoelectricity
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3) Landolt-Börnstein, Numerical Data and Functional Relationships of Physics - Chemistry - Astronomy - Geophysics and Technology, 6th Edition, Second Volume, Properties of Materials in their Fundamental States, Part 6. Electrical Properties I
273, The elastic, piezoelectric and dielectric constants of piezoelectric crystals.
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C. Miscellaneous

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