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2568 Local Vascular Changes Induced by the Co-carcinogen, Phorbol Myristate Acetate. A. Janoff, A. Klassen, and W. Troll.
This issue commemorates the establishment of the cocarcinogene-
sis concept by Murray J. Shear (b. 1899) and Isaac Berenblum (b.
1903).

Shear, Associate Director, Interdisciplinary Communications
Program, Smithsonian Institution (Washington, D.C.), and formerly
Chief of the National Cancer Institute’s Laboratory of Chemical
Pharmacology, reported in 1938 that a basic fraction of creosote
oil enhanced the production of mouse skin tumors by 3:4-benz-
pyrene. He considered this fraction to be the source of a “co-car-
cinogen” [M. J. Shear, Studies in Carcinogenesis. V. Methyl Deriva-
532), 1938]. Subsequent investigations by Shear and his associates
uncovered cocarcinogenic action in conjunction with other car-
cinogens (M. J. Shear, Studies in Carcinogenesis. VII. Compounds
Related to 3:4-Benzpyrene. Am. J. Cancer, 36: 211-228, 1939; S.
Cabot, N. Shear, and M. J. Shear, Studies in Carcinogenesis. XI.
Development of Skin Tumors in Mice Painted with 3:4-Benzpyrene
and Creosote Oil Fractions. Am. J. Pathol., 16: 301—312, 1940;
R. D. Sall and M. J. Shear, Studies in Carcinogenesis. XII. Effect
of the Basic Fraction of Creosote Oil on the Production of Tumors
in Mice by Chemical Carcinogens. J. Natl. Cancer Inst., 1: 45—55,
1940).

Isaac Berenblum, of the Weizmann Institute of Science (Rehovot,
Israel) and formerly of the Dunn School of Pathology (Oxford Uni-
versity, England), in 1941 reported the cocarcinogenic properties
of croton oil resin (I. Berenblum, The Cocarcinogenic Action of
Croton Resin. Cancer Res., 1: 44—48, 1941). This work suggested a
multistage mechanism underlying the effect of croton oil in the de-
velopment of epidermal neoplasms (I. Berenblum, The Mechanism
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conclusions were independently reached by Rous and Co-
workers, from investigations of tumor regression in rabbit skin (P.
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the two-stage hypothesis of cocarcinogenic action by quantitative
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Carcinogen in Tumour Induction of the Mouse Skin. Brit. J. Cancer,
1: 379—382, 1947; I. Berenblum and P. Shubik, A New Quantita-
tive Approach to the Study of the Stages of Chemical Carcinogen-
of the topic is available [I. Berenblum, The Two-Stage
Mechanism of Carcinogenesis as an Analytical Tool. In: P. Em-
melot and O. Mühlenbeck (eds.), Cellular Control Mechanisms
1964].

Dr. Shear was President of the American Association for Cancer
Research in 1960—1961; he appears left in an earlier photograph by
courtesy of the National Institutes of Health Photographic Re-
search Section. Right, Dr. Berenblum, ca. 1945.
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