FILE NAME: Oil Industry and American Petroleum Institute (API)

DATE: 1955 Nov

DOC#: API163

DOCUMENT DESCRIPTION: The Medical Bulletin Article - Environmental Factors of Occupational Origin Related to Carcinogenesis

RECD NOV 22 1999

THE MEDICAL BULLETIN

VOLUME 15 NOVEMBER, 1955 NUMBER 3

CONTENTS

Standards for Safeguarding the Health of the Industrial Worker 167
Herbert E. Stokinger, Ph.D.

Dermatoses Due to Oils Used in Industry 185
C. M. Peterson, M.D.

Environmental Factors of Occupational Origin Related to Carcinogenesis 193
Ian Macdonald, M.D.

The Early Diagnosis of Gastro-Intestinal Malignancy 202
G. E. Bock, M.D.

Accident Proneness—A Clinical Approach to Injury Liability 214
Alan A. McLean, M.D.

Constructive Medicine at Lago 226
Robert Turfboer, M.D.

The Medical Program and Facilities of the Standard-Vacuum Oil Company at Manila, Republic of Philippines 234

Newsnotes 238

Letters to the Editors 245

ENVIRONMENTAL FACTORS OF OCCUPATIONAL ORIGIN RELATED TO CARCINOGENESIS*

IAN MACDONALD, M.D.**

Although 179 years have passed since the first cancer of occupational origin was identified, only in the past 30 years has the list been extended to include a variety of causes of different types, many of them peculiar to certain industries. The list now includes a considerable number of agents for which there is unmistakable evidence of carcinogenicity and a still longer list of suspect substances for which proof of their ability to evoke a neoplastic response is still lacking. As is consistent with the complexity of human cancer in general, some of the more recently acquired knowledge in this area has posed more problems than it has answered. From the standpoint of the industrial physician, there are two respects in which occupational cancer is by good fortune dissimilar to most of the known causative factors for cancer in general: much of the constantly accumulating knowledge of occupational factors has brought into sharp focus the hazards of occupational exposure to certain agents, and once these environmental factors in industry are identified their control is usually entirely practical. In many instances cancers of environmental origin have been demonstrated to present an epidemiological picture as clear as that of many of the controlled infectious diseases.

It will be obvious that the increase in occupational factors both established and suspect as carcinogens during the past several decades is a reflection of the increasing degree of industrialization of our society, some phases of which have aroused the curiosity, some phases of which have aroused the curiosity and active interest of experimentalists in cancer. The number of industries utilizing substances from which it is known or suspected that carcinogens may be derived is increasing, and the occupationally and environmentally exposed members of the population are, as a corollary, increasing. In industry as in medicine there is greatly increased exposure of personnel to radioactive waste and degradation products. Among the newer chemical hazards in the occupational environment one thinks of the utilization of macromolecular

Reprinted with permission from Journal of the American Medical Association, Jan. 1, 1955, Vol. 157, No. 1.

**School of Medicine, University of Southern California.

Table 2.—Environmental Carcinogens

Name	Date	Discoverer	Organs Affected	Nature of Exposure*
Soot	1775	Potts	Skin (scrotum)	O. (chimney sweeps)
Arsenic	1822	Ayrton	Skin	O., E.
Paraffin oil	1875	Volkmann	Skin	O. (lignite and shale oil industry)
Shale oil	1876	Bell	Skin	O.
Pitch and tar	1876	Manouvriez	Skin	O.
Crude oils (some)	1879	Harting and Hesse	Skin	O.
Sun (ultraviolet rays)	1893	Unna	Skin	O. (farmers, sailors)
Aromatic amines	1895	Rehn	Bladder	O. (dye industry)
Roentgen rays	1902	Frieben	Skin	O., M.
Schistosoma hematobium	1911	Ferguson	Bladder	E., O. (Egypt)
Roentgen rays, radium	1911	Von Jagicz, Schwartz, and Von Siebenrock	Bone marrow (lukemia)	O., M.
Anthracene oil	1913	Rambousek	Skin	O.
Betel nut, tobacco	1915	Davis	Mouth	Habit (India, Malay)
Diet deficiency	1919	Mouchet and Gerard	Liver	E. (poverty diets, Africans, Chinese)
Radium	1920	Leitch and Sequira	Skin	O., M.
Lubricating oils	1922	Southam and Wilson	Skin	O. (mule spinners)
Creosote	1924	Cookson	Skin	O.
Benzol	1928	Delore and Bergamo	Bone marrow (lukemia)	O.
Uranium	1929	Lowy	Lung	O.
Radioactive rays	1931	Martland	Bone	O., M.
Chromates	1932	Alwens	Lung	O.
Nickel carbonyl	1932	Stephens	Nasal sinuses and lung	O.
Asbestos	1934	Wood and Gloyne	Lung	O.
Radioactive rays	1934	Neitzel	Lung	O., M.
Tar fumes	1936	Kahawata	Lung	O.

*O., E., and M. = occupational, environmental, and medical.

Carcinogenic st
a hazard both to
general. The pot
basis of their nat
sponding to then
biological. Their
soil, or in the wa
of initial contact
and eliminative
seems entirely p
toxicologic pract
is the necessary
ally exposed.

1. Occupational
ment of Health, 1

2. Hueper, W. (
Agency, p. 10.

arcinogens

rgans ffected	Nature of Exposure*
in (scro- tum)	O. (chimney sweeps)
in	O., E.
in	O. (lignite and shale oil industry)
n	O.
n	O.
n	O.
ı	O. (farmers, sailors)
lder	O. (dye industry)
ı	O., M.
lder	E., O. (Egypt)
ɛ	O., M.
ırrow ukemia)	
	O.
:h	Habit (India, Malay)
	E. (poverty diets, Africans, Chinese)
	O., M.
	O. (mule spinners)
	O.
	O.
row emia)	
	O.
	O., M.
	O.
	O.
es lung	
	O.
	O., M.
	O.

edical.

Summary

Carcinogenic substances incidental to industrial procedures represent a hazard both to those occupationally exposed and to the population in general. The potential carcinogenic materials may be classified on the basis of their nature, their environmental site, and the target tissues responding to them. Their natural state may be chemical, physical, or biological. Their environmental site may be in the atmosphere, in the soil, or in the water. The tissues responding to them may be at the site of initial contact or in organ systems concerned with their metabolic and eliminative processes. The control of these environmental factors seems entirely practical on the basis of current industrial hygiene and toxicologic practices. An awareness on the part of industrial physicians is the necessary starting point for the protection of those environmentally exposed.

REFERENCES

1. Occupational Cancer: A Challenge to the Physician, New York State Department of Health, 1949, pp. 10-13.

2. Hueper, W. C.: Environmental Cancer, Public Health Service, Federal Security Agency, p. 10.