

PUBLIC HEALTH

Radioactivity in Tobacco

► A RADIOACTIVE ingredient of tobacco is suspected by two Harvard University scientists of being a long-sought link between cigarette smoking and lung cancer in man.

The ingredient is polonium, one of the scarcest of the naturally occurring radioactive elements. It is present in small amounts in tobacco as a natural contaminant.

The report is the first to suggest that radioisotopes in cigarettes are involved in the production of lung cancer, although it has long been known that ionizing radiation can produce cancer in man.

In a preliminary report published in *Science*, 143:247, 1964, the investigators said that a man smoking two packs of cigarettes a day could have polonium deposited from smoke in his bronchial linings that would deliver a radiation dose at least seven times the normal background radiation exposure of nonsmokers.

Dr. Edward P. Radford and Dr. Vilma Rose Hunt, an Australian-born woman scientist, who are working in the Harvard School of Public Health, said their estimate of a minimum dose of 36 rem (units used to measure the exposure of human tissue to radiation, standing for roentgen equivalent man) is conservative for smokers of two packs a day.

A dose of 100 rem or more for the process of polonium absorption could be more realistic. The scientists further state that

it is likely that polonium concentrated in specific regions of the bronchi may range from several hundred rem to over 1,000 rem in a person smoking two packs a day for 25 years.

Polonium is vaporized at the burning temperature of the cigarette and is carried into the lungs by attaching itself to the smoke particles. Most of this radioactive element, the investigators said, is eventually taken up by scavenger cells, called phagocytes, and carried over the bronchial lining to the throat.

The radioactive half-life of polonium is 138 days, the researchers noted. This assures ample time for the translocation of the particles to the bronchi.

Polonium is present in all green plants. It is absorbed by the roots and, to a lesser extent, by the leaves from the natural radioactive fallout in the atmosphere. The term "natural fallout" is used to differentiate from atom bomb fallout, which in no way is related.

Four regular-sized American brands of cigarettes, two filter brands and two non-filter, were employed by the Harvard scientists in their laboratory, using equipment they had devised to puff them artificially. About 80% of the polonium disappearing in the smoking process could be accounted for.

• *Science News Letter*, 85:70 Feb. 1, 1964

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Cigarette, Emphysema Link

► AN IRRITANT, such as tobacco, has a "causal role" in emphysema, the rapidly growing lung disease often associated with chronic bronchitis, a group of Jacksonville, Fla., researchers reported in the *Archives of Pathology*, 77:82, 1964.

The Surgeon General's Advisory Committee on Smoking and Health was careful not to use the word "cause" in its association of cigarette smoking and emphysema, although it did "associate" an increased risk of dying from emphysema with cigarettes.

The Florida researchers included Drs. J. A. Hernandez, A. E. Anderson Jr., and Alvan G. Foraker of the Research Laboratory of Baptist Memorial Hospital. Among the individuals listed for acknowledgment of help in the Government report were Drs. Anderson and Foraker.

The Florida research included studies of the bronchial structure of emphysema patients. The association with chronic bronchitis was not shown in increased size of bronchial glands but the bronchial tubes of the emphysema patients did show changes comparable to those noted in heavy smokers.

The Advisory Committee definitely used the word "cause" in relating cigarette smoking with chronic bronchitis, although cigarette smoking was never called the only cause of this or other diseases.

The Florida researchers said the "personal air pollutant, that is, tobacco smoke, may well be the most significant" of the causes of inflammation of the bronchial tubes. Such an inflammation is considered one of the most important of the multiple mechanisms responsible for emphysema.

British researchers have continuously associated chronic bronchitis with emphysema, but the Florida researchers pointed out that most Britishers have poorer heating facilities and are exposed to higher atmospheric humidity. The burning of soft coal has been implicated in lung irritation of British patients, but in Wales, where the air is relatively clean, emphysema and bronchitis also are linked.

• *Science News Letter*, 85:70 Feb. 1, 1964

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Cigarette Aversion From Electric Shock Treatment

► WHEN ALL OTHER anti-smoking remedies failed, shock therapy succeeded with a 37-year-old school teacher who had smoked 40 cigarettes a day since she was 18.

"Aversion" treatment by electric shock was given the teacher by two psychologists in Glasgow, Scotland. She was seen several

times a day, and on each occasion she was asked to smoke a cigarette in her usual way. After inhalation she was given a shock.

After two weeks, the teacher began attending weekly out-patient clinic sessions, at which she was allowed to inhale one cigarette followed by shock treatment.

Apart from this weekly cigarette, the patient has now gone six months without cigarettes with no difficulty in abstaining, the researchers reported in the *British Medical Journal*, Jan. 18, 1964.

Abstinence shock treatments also were reported by the Glasgow researchers for patients troubled by sexual perversions, alcoholism and neurotic symptoms.

Dr. R. J. McGuire of Southern General Hospital, and Dr. M. Vallance, psychiatric registrar at Hawkhead Hospital, both in Glasgow, constructed a cheap, simple apparatus that can be taken home by the patient for use after initial instructions.

One patient with writer's cramp, who was about to lose his clerical job, succeeded in overcoming the tight grip on his pen, which was connected to a press switch. Whenever his grip exceeded the desired pressure, the switch closed and a shock went through the pen.

Thirty-nine patients in all have been treated successfully at Southern General Hospital. Shock treatment for obesity due to overeating has now been started.

• *Science News Letter*, 85:70 Feb. 1, 1964

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Ashtray Could Become As Obsolete as Cuspidor

► THE ASHTRAY could become as obsolete as the cuspidor if social snobbery attacks cigarette smoking in the same way it killed tobacco chewing.

Snobbery may succeed where reasoning and fear fail, an editorial in the *Annals of Internal Medicine*, Jan., 1964, contended.

"Only a few years ago," the editorial said, "the bright brass cuspidor was a respectable fixture in banks and barristers' offices." Now it serves chiefly for the culture of philodendron on suburban coffee tables because of the social snobbery that condemns many symbols of social status or distinction to the dump heap.

If physicians who now smoke would take the stand that smoking cigarettes is harmful, and that although they too find it hard to give up the habit they are making the effort, abstinence may become the fashion and infect our whole society, the editorial, written by Dr. Edward J. Huth, associate editor, said.

The public can hardly be expected to give up smoking when physicians persist in using cigarettes in spite of witnessing the havoc of cigarette-caused lung cancer and other diseases, Dr. Huth pointed out.

The physician who has smoked and stopped can present himself in that most convincing of social roles, the man who is both superior and human, betrayed as human by his eloquent account of the acute though temporary agonies of abstinence, stamped as superior because he did win.

• *Science News Letter*, 85:70 Feb. 1, 1964