Communications

Incidence of Lung Tumors in Albino Mice Exposed to Smoke of Cigarette Paper

We have attempted to investigate experimentally the major ingredients of the cigarette as possible carcinogenic agents of lung tumors. The smoke of the cigarette paper has been studied, and the results are reported in this article.

In this experiment, 74 young, sexually mature A/Jax mice were used; 38 of these served as experimental and 36 as control animals. The sexes were approximately equal in both groups. A standard grade of cigarette paper was used for furnishing the smoke. By experimenting, we found that better burning conditions could be obtained by rolling sheet after sheet, 9 in all, of the paper into a cigarettelike object. After normal acclimatization [J. M. Essenberg, *Science* **116**, 561 (1952)], the experimental mice were placed in the experimental chamber and the controls, in the control cage of the automatic smoking machine. This machine, which was described in my previous article, is set to smoke 12 cigarettes per day, one per hour, 6 days per week for 1 year. The environment of the control mice was exactly like that of the experimental animals except for the smoke from the "cigarettes." Fresh air circulated through both cages continuously, and food and water were always available. At the end of the experiment, the animals were sacrificed and fixed by the perfusion method. Both lungs and the heart were removed together, embedded in paraffin, sectioned and mounted serially, and stained by the hematoxylin-eosin method.

There is a very slight preponderance of tumors in the experimental over the control mice, which is not significant by statistical analysis. There were eight carcinomas and five adenomas in the experimental, and five carcinomas and six adenomas in the control mice. Hyperplasia of the lung tissue was present in both groups. Also, pneumonia and lung congestion occurred about equally in both groups. Their weight curve and reproductive capacity differed in this experiment from those of previous studies. The mean weight of the two groups of animals remained practically the same; the difference was 0.75 g in favor of the controls. For the first time in our studies, three litters of young were produced by the experimental mice in the smoking chamber. The control mice produced freely.

The results of this experiment indicate that cigarette paper has little or no effect on the generation of lung tumors in albino mice.

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Financing of Medical Schools

I was much interested in the editorial in the issue of 20 August, page 5A. The financing of medical schools is a very complicated business, but I do not think that the answer is the method advocated in your editorial.

Although going in debt to obtain an education has been a success in thousands of cases, to make it a mass project would have an adverse psychological effect on the majority of students. It would be too much of a millstone around their necks; and the desire to get out from under the burden could well lead to undesirable practices in many cases. Many who could do valuable research work would have to secure any practice they could in order to get out of debt.

I am one who believes that the government should divert a small percentage of the money spent on European aid to help medical schools, even if the bigwigs in the A.M.A. do not agree with me. I have been a member of the A.M.A. for many years but am not a "yes man."

J. W. ROBINSON

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The writer is responsible for the note on "The financing of medical schools" that appeared on the editorial page of the 20 August issue. Contrary to J. W. Robinson's implication, I did not advocate (nor did I oppose) the solution proposed therein. I was merely presenting Brian Bird's views on the matter, without any attempt to assess their feasibility or desirability.

The problem of financing medical schools, more particularly private ones, is especially acute and of prime importance. It is therefore highly desirable that all possible solutions be examined with the greatest care. Bird's suggestion represents only one possible solution. Robinson has offered another, involving governmental aid. I cannot pretend to know whether either of these proposals is practicable or advisable. But I do believe that the proper solution of this serious problem can be accomplished only after all possible approaches have been considered.

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9 November 1954.