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Visit to the Drs. Leuchtenberger at  
Centre Anticancer, Hux Romand, Lausanne  
19th February, 1964

Object of the visit

The purposes of the visit were,

- (a) to see if the Leuchtenbergers would lend or allow us to purchase the mouse-smoking chamber used by them in U.S.A. or give or lend us drawings and details of construction of the chamber and,
- (b) to ascertain their future research plans and to find out if these were likely to be restricted in any way for lack of funds.

Current researches

The Leuchtenbergers are now in laboratories in a new building devoted to medical research and pathological services for the Canton Vaud. They moved in during October and have only recently received their equipment from U.S.A. They are not yet fully operational, but have a considerable amount of work in progress. As will be seen from a later report of their future plans, they will be wanting to use the exposure chamber but they very readily agreed to lend us their only drawing on condition that we return it quickly after copying. They told us that they had given in the past a copy of the drawing to Dr. Weber.

We were shown their original machine partly reassembled and photographs of it in its complete form. We saw the smoking process in action. The exhaust gases from the pumping system are returned to the room and so can pass through the Seitz filters either back through the smoking chamber or through the control chamber. The control animals thus receive a small dosage of smoke gases. The cigarettes are smoked by continuous suction, thus allowing both main stream and side stream

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smoke into the chamber. This is rapidly filled with smoke and cleared quickly when the cigarette is completely consumed. A clockwork mechanism brings successive cigarettes into use at pre-determined intervals.

The Leuchtenbergers said that they were thinking of a new type of exposure chamber, working on intermittent puffs of smoke. This superficially will resemble that proposed by the Battelle organisation, with the mice restrained in individual chambers arranged radially around a central smoke supply. No details of the puffing mechanism had been considered. In discussion of this a "Fillomatic" type dispensing syringe was suggested by us as the basis of the puffing mechanism.

We agreed to keep each other informed on developments in design of smoking machines that could provide accurate dosage.

Dosage measurement was discussed and the possibility of using carbon monoxide concentration in blood as an indication of dose received by individual animals was considered. It was realised that such measurements might not determine retention of particulate matter.

The Leuchtenbergers would like assistance in measuring carbon monoxide and if T.R.C. can develop a rapid microchemical method suitable for testing the blood of relatively large numbers of individual animals, they would welcome the details and possibly someone to train their people in the technique.

We then discussed the inhalation experiments that T.R.C. plans to do. Cecilie explained that to eliminate genetic differences they propose to use in both experimental and control groups, litter mates of an in-bred strain of mouse and to use both male and female animals. She also pointed out that there was a surprising difference in the susceptibility of the two sexes, and that the males exhibited more cellular proliferation in the lungs.

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The Leuchtenbergers' published results were then discussed at length. Rudolph explained that with cell proliferation a protective concentration of lymphocytes surrounding the focus of proliferation appeared to act as a barrier. During the discussion they discovered in their paper (No. 3) that they had recorded a sex difference in lymphocyte numbers in males suggesting that the females were more protected.

Future research plans of the Leuchtenbergers.

- (1). They intend to continue work on administering virus and smoke. They have animals which have experienced three sub-acute infections with the same virus strain. These animals are now ready to be exposed to smoke. A machine is therefore needed now.
- (2) If they get their new type smoking machine, they wish to compare results from both old and new types of machine.
- (3). They intend to use two types of cigarettes but were very reticent about the differences between them. However, they admitted that one was a treatment of a normal cigarette. In view of the letter from Dr. Hockett (B24), it seems reasonable to assume that a nickel-free cigarette will be investigated.
- (4). Cecilie will continue with cytochemical studies of D.N.A., R.N.A. and protein contents of single cell nuclei by micro-spectro-photometry, interferometry and fluorimetry.
- (5). We indicated to the Leuchtenbergers that T.R.C. might be prepared to give them additional support. They expressed their appreciation of this and agreed to submit a request to the Director should this be needed.
- (6). They have a large collection of specimens from earlier experiments including hearts, livers and kidneys as well as lungs that could be examined if this is considered desirable.

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(7). The Leuchtenbergers are preparing accommodation for cell culture work. This may be a valuable technique usable for a rapid biological test on smoke and smoke constituents.

Miscellaneous comments.

(1). We discussed the M.R.C. - T.R.C. Planning Committee experiments in which exposure to smoke after infection by influenza virus is planned. In this connection, we pointed out the similarity between the Leuchtenbergers' work and that reported by Kotin and Weiseley. Cecilie appeared to be critical of Kotin and pointed out that the work had not been published as a full scientific paper. She had asked Kotin for details and he said he was too busy to publish. It must be pointed out here that the Leuchtenbergers have consistently failed to obtain bronchogenic carcinoma in their work.

(2). Cecilie suggested that all interested parties might be persuaded to agree on a common pattern of smoking machine for the reproducible dosimetric exposure of animals to smoke.

(3). The mouse rooms at Lausanne are fitted with transparent plastic cages. These have an advantage over wire cages that animals cannot damage their jaws by gnawing at the metal bars.

(4). The Leuchtenbergers would like to have some I.C.I. S.P.F. mice, males and females.

(5). We think that Dr. Day should visit the Leuchtenbergers at this stage of the expansion of Harrogate work.

(6). The Leuchtenbergers can arrange to visit U.K. on their way to U.S.A. in mid-August. They should see Harrogate and discuss progress with T.S.C. scientists.

(7). We should maintain the contact established with them and exchange information as frequently as possible.

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