

From : Sir Charles Ellis, P.M.C.

30th March 1971

Dr. M. Niebet,  
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Thank you for your letter of March 5th, which was brought over by Mr. R. Wade. I am glad you have made this thorough literature search. I too have now looked at most of the papers you mentioned, and I am led to the conclusion, which I admittedly did not expect, that despite all these experiments very little has emerged. The existence of a phenomenon has been established, not much else.

As are of course dealing with a biological material with all its variability but as far as I can see no one has taken adequate precautions to minimise this variability as much as possible. However, it is an important forward step to appreciate that these peculiar surface tension - thickness relations are necessary for the stability of the alveolar spherulets, and it has been shown that something in emulsions can effect this relation. This qualitative information is really all we know, and I personally would not put any trust in the many more detailed results, for the reasons given below. I think it is a waste of time to worry about them. There is one more highly interesting point however and that is the existence of the "hysteresis" loop; what is the interpretation of this?

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I therefore conclude that if we are going to enter this field we have to start almost from the beginning. The first point must be to endeavour to be as precise as possible about the identity of the biological material, the surfactant. It would seem to me that washings are quite unsatisfactory, surely these may be mixed up with bronchial mucus. I should have thought that some animal like rat, rabbit or guinea pig could be anaesthetized, the thorax opened and the alveoli dissected off. Then the animal would be sacrificed, the alveoli part of the lung removed and the surfactant extracted. Physical measurements should be made on this material with careful attention to variation of the rheological properties with time elapsed since removal. The experiment would then be repeated with the animal having been "smoked" beforehand, using one of the normal methods.

I think such an experiment would be worth doing and if the results appeared dependable could be repeated on larger animals, monkeys and dogs.

What do you think of such a scheme? Would you wish to undertake it? Clearly it would mean collaborating with a hospital or University laboratory but the work would divide up nicely. You would prepare the physical apparatus and test it out with, say, dipalmitoyl lecithin, arrange for it to be portable and set it up in the hospital laboratory. You would also wish to be responsible for the smoking machine to treat the animal. Your medical collaborator would do the extraction and preparation of the surfactant.

I think something on these lines is viable and could lead to important results. Do you wish to take it on in Montreal? I hope you will, but if not let me know and I will try and get it organized over here.

c.c. Mr. R. Wade  
 Dr. S.C. Green ✓  
 Dr. G.H. ...

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