SECTION J — Discussion: Applications — Industry and Biology

Note: A participant's full name and address are given with the first contribution to the Discussion. Authors' full names and addresses are given with the title of each paper. For subsequent entries the addresses are omitted.

Paper J-3: Fundamental Research on Theories in Canning Machinery, *C. C. Collier*, Food Machinery and Chemical Corporation, Hooperston, Ill.; and *J. J. Larish*, Ansco Division of General Aniline and Film Corporation, Binghamton, New York.

John Hadland (John Hadland & Company, Chipperfield, Kings Langley, Hertfordshire, England): Research in the United Kingdom has been carried out using Fastax cameras to examine carton-filling operations. When filling cartons with sugar, we have found that a restricting factor in high-speed filling is the trapping of air beneath the product in the packet. It has been shown that if the product is introduced into the packet through a tube, and a vacuum line introduced immediately above it, the trapped air is sucked away and the packet filled more quickly. It would seem that this technique could also be used with liquid fills.

C. C. Collier: We do have a filler that we use on No. 10 cans of milk that we call "bottom filled" cans. The vent tube in the center is only to let the air escape from the can. We did find that it was difficult to prevent the escaping air from throwing some of the product back up through the vent tube.

Paper J-6: Technique of Measurement of Blood Cell Velocity in Transparent Chambers in Animals, *P. A. G. Monro*, Anatomy School, University of Cambridge, England.

Lincoln L. Endelman (The Martin Company, Cocoa Beach, Florida): Have you considered making, or have you made, any studies of the eyeball by this method, or by attempting to use a cine camera in conjunction with an ophthalmoscope?

A. M. P. Brookes (Engineering School, University of Cambridge, England): No. We've never done that. The apparatus could, I think, be adapted fairly readily; but Dr. Monro is himself not working on the eye. I'll mention this to him because I think it would be most interesting to other people in the Anatomy Department.

Paper J-8: High-Speed Photography in Medical Research (film), *E. S. Gurdjian, H. R. Lissner and L. M. Thomas*, Neurological Surgeons, 801 David Whitney Bldg., Detroit, Michigan.

Lincoln L. Endelman: When you wish to observe the reactions, how do you overcome the rigidity of the cadaver, since rigor mortis has already set in? I assume that they are not true reactions under these conditions.

Dr. L. M. Thomas: The reactions are truer than you would expect, because the body is not as stiff as you would imagine. Once the muscles have been moved, after rigor has set in, the stiffness is no longer present. Because of this, it is easily possible to make the neck rather flexible, as could be seen when the head struck the plate-glass window. To give a truer sample, the experiments would have to be done on the living; and I don't think we can find any way of doing that.

Paper J-9: Biological Applications of High-Speed Photography (film), *Eric Lucey*, Institute of Animal Genetics, Research Film Unit, University of Edinburgh, Scotland.

Charles A. Jantzen (Photographic Analysis Company, 100 Rock Hill Road, Clifton, New Jersey): I've been involved in some of this type of work. I was wondering if you have ever accomplished the recording of a consonant. I noticed all the sounds in your film were vowels. You could possibly photograph a "g" or "c" without closing the mouth and swallowing.

E. Lucey: I cannot say. I have not tried this. As it was my vocal cords on the film for part of the while, I can assure you that consonants would be impossible with the laryngeal mirror in place. We are going to do a lot more work as soon as we have installed proper facilities in Edinburgh, and will probably be doing experiments to see how wide a range of vocalization we can, in fact, record.

C. A. Jantzen: Do you think perhaps x-rays could possibly show us anything on consonants?

E. Lucey: I have seen several films, particularly from France, of x-rays of the speaking larynx; but certainly I don't think that one gets as much information as to the exact position of the vocal cords from these films, because one is looking laterally rather than vertically at the cords.

Zev Pressman (Stanford Research Institute, Menlo Park, California): Was anaesthesia of the subject's throat necessary for making motion pictures of the vocal cords?

E. Lucey: No, but the subjects had to practice in order to be able to tolerate the procedure.