

SCIENTIFIC FILMS IN TEACHING PHYSICS

A DISCUSSION on "Scientific Films and their Use in the Teaching of Physics" was held at a meeting of the Physical Society, on November 20. It was opened by Mr. W. Ashhurst, who pointed out that more lecturers and teachers would use films if they knew more about the technique of their use and could obtain sufficient suitable ones.

Undoubtedly there will be a great increase in the number of projectors in use after the War. The War has seen a wide increase of use of the film as a training and propaganda medium. The fighting Services and Home Guard are now using projectors. The Ministry of Information has equipped and trained a corps of projectionists; potentially, this service, now devoted to propaganda, could be a magnificent adjunct to educational media in peacetime. We may well be at the beginning of a revolution in teaching and demonstration techniques. It is urgent that science teachers should have clear aims and a clear attitude to this medium. The film should be treated as an essential part of public education and public service, as are laboratories, gymnasia and clinics. The few projectors in use in England can be contrasted with the large numbers in use in other countries.

Mr. Ashhurst then referred to an article by Mr. Oliver Bell, director of the British Film Institute, in the *Documentary News Letter*, in which it is suggested that the Government should be prepared to spend £1,500,000 in ten years on visual education.

On the production side, Great Britain has created some good scientific films, but so also have other countries, and "Mouvements Vibratoires" is an example of French lucidity and elegance in the making of a science teaching film.

The cinema has much power in the class room. It can enliven the teaching of pure science and can also point dramatically and vividly to its applications. It appeals in a familiar way, and, with suitable guidance by the teacher, important information can be impressed upon the memory. The film brings the outside world into the class-room. In science teaching, the application of fundamental principles in industry can be presented in a manner from which, very often, more can be learned than by actually taking a tour around a workshop or industrial plant.

The film has obvious advantages over the blackboard for illustrating a moving mechanism. Animated diagrams can be exceedingly clear. Quickly moving objects can be photographed using slow-motion photography, which is useful in engineering, and speeded-up photography is largely responsible for the success of plant-life films. Both these techniques have obvious applications for the practical exposition of physics problems.

The old controversy of the relative merits of sound and silent films may be resolved by stating that each has its own particular uses. Undoubtedly, the majority of science teachers prefer to supply the commentary. Each topic should be treated in the manner more suited to it. Obviously, a film illustrating a demonstration of a 'sound' experiment should be a 'sound' film, and, similarly, a film about colour should be in colour. It thus follows that most expositional films should be silent, whereas application or background films, sound. Generally speaking,

a film which is to be run straight through should use sound, for then the commentary would be carefully worded and synchronized; in contrast, a teacher's extempore commentary would be very inferior.

A film should not be used in place of a demonstration.

The diagrammatical film can be drawn perfectly and 'animated'. A special type is the cycle or loop film. Loop films are used in the representation of cyclic actions. Their unique value is in memorizing cycles and presenting physical and mathematical rhythmic phenomena in a vivid way.

There are at least four ways of using films in the class room. (1) As an illustration comparable in its use with a lantern slide. An example of this type, which should necessarily be short, is the cycle film. It is a brief demonstration introduced as incidental to the theoretical lesson. (2) As a basis for a film lesson. A special lesson is given based on the particular film. It is necessary for the teacher to know the film well and build around it. Different teachers have different methods, but the value of the film is lost if it is not discussed fully afterwards and the important points pressed home. Many teachers commence the lesson by a showing, then, by questions, analyse its content and deal with the theory involved, finally concluding the lesson by a second showing. Experience shows that the attention should be directed before, or during the showing, to important things. There is always the tendency for the attention to wander on to something of lesser importance. (3) For revision purposes. There is a great possibility for such films. A good ten-minute film can revise effectively the work of several lessons. (4) To show the application of fundamental principles and possibly their social implications. Here, background films are employed, and with their aid the class is taken from the class room to the factory or industrial plant. The scope of such films is unlimited and their value obvious. It is through the social and industrial documentary that science joins hands both with the rest of the curriculum and the outside world.

The opening remarks were followed by a showing of various films. These were selected to illustrate the different types, namely, the illustrative film, the film for the film lesson and the background film.

In the discussion which followed, opinions were stated by members, some experienced and others inexperienced, in film use. Many physicists are prejudiced against the use of films, as physics deals with real things, not pictures. Moving diagrams may be annoying, but perhaps, as the pupil becomes familiar with such representations, he may not be so affected. The film may offer a solution in special cases where laboratory and demonstration facilities are not good; for example, in workshop schools far removed from a technical school. On no account should irrelevant matter be included: the teaching film should be full of substance and devoid of theatrical packing.

There are clearly great possibilities for films depicting the lives and work of the great men of science. The few such films already in existence, for example that on the life of Pasteur, are obviously not suitable for use as a whole in schools. Excerpts might perhaps be made, but it would be very much better to prepare films specially for school use, giving particular attention to the limitations imposed by class-room conditions as regards both time and physical difficulties.