

INSTRUCTIONAL FILM RESEARCH IN PENNSYLVANIA

ACCOUNTS of the early reports of the Pennsylvania Instructional Film Research Program have already been given in *Nature*^{1,2}, and it is the purpose of this article to review shortly some further Pennsylvania reports* now available in Great Britain. In every Pennsylvania experiment in which the learning results have been objectively assessed, people have learned from the films shown them³. Many of these further studies confirm that films can teach effectively, and though this, in fact, is usually discovered incidentally, it is sometimes borne out as the result of the main purpose of an experiment, as in Study 29, which deals with the instructional effect of the film "How to Operate the 16-mm. Sound Projector Set".

Learning from films may be factual learning or motor perceptual learning. A group of the new Studies, 25-27, by S. F. Harby, is concerned with the use of film-loops, daylight projected, for the teaching of athletic skills. The film-loop demonstrations were as effective as live instructor demonstrations, the addition of physical practice and coaching to the film-loop demonstrations being advantageous. A directed system of watching the film-loops and of practice was better than leaving the students with no outside guidance.

Mental practice, defined as the symbolic or covert practice of a perceptual-motor skill and described as resulting from trying to "imagine the feel of it", is—according to M. A. May⁴—an ingredient in any film-learning situation. Study 26 compares the effectiveness of mental and physical practice. There is a point beyond which mental practice does not help. Twenty periods of physical practice were significantly more effective than twenty periods of mental practice. Films extend the time learners can and will practise mentally.

A number of earlier findings of the Pennsylvania research are confirmed by the new studies: repeated showings of a film can result in a worth-while increase in learning (Studies 29 and 25-27); increased experience of films in training improves the ability of an audience to learn from films (Study 20, by A. W. Vander Meer); and note-taking during the showing of films interferes with learning (Study 21, by Ash and Carlton, and also independently reported⁵).

As in all learning situations, the student who is to learn from films must wish to learn and perceive relevance in what is put before him. A number of the new studies deal with the motivation of the student towards learning, with his participation and involvement, and Study 24 shows that anxiety—fear of the consequences of failing in a test of knowledge gained from a film—leads to increased learning. The advantages of a pre-film test of performance and of factual knowledge are shown by Studies 29 and 35, and of providing the correct answers to all test-questions—rather than merely informing a student that he is right or wrong—by Study 30. Study 33 shows that written titles making plain the 'organizational outline' of a film increase learning, particularly for the less intelligent.

A further comparison of black-and-white and colour films (Study 28) shows that colour makes a

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contribution to retention of what is learnt rather than to learning itself, but this contribution does not seem to be large enough to justify the additional cost of coloured films. The single Study (32) so far carried out on stereoscopic films shows no advantage in stereoscopy.

Study 23, "Film Profiles", by Loran Twyford, in examining the value of subjective evidence, has some general psychological interest and is also of interest because it may lead to a change in the method of film investigations. The popularity of a radio programme has often been assessed by what is called 'a rating profile', a profile based on polygraph recordings of the responses of a sample audience, peaks in the profile representing sections of the programme to which a large number of the audience respond positively. Would the rating of an instructional film based on positive responses 'I am learning' and negative responses 'I am not learning' be a valid rating of learning? It was found in the Pennsylvania experiments that the subjectively based profile was, in fact, correlated highly with an 'objective test' profile, and in another film investigation, outside Pennsylvania, the subjective judgment of an audience has appeared similarly valid⁶.

Report 31, by the director of the Pennsylvania research, is largely a more positive statement of principles previously put forward as "trends of results"⁷. In general, the sixteen studies reviewed confirm and refine earlier results, although a first experiment on stereoscopic films has been made, and a fresh finding may lead to a change in the method of film investigations.

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¹ Pegge, C. D., *Nature*, 168, 775 (1951).

² Pegge, C. D., *Nature*, 170, 962 (1952).

³ Greenhill, L. P., and Carpenter, C. R., *Med. Biol. Illustration*, 3, 30 (1953).

⁴ May, M. A., *J. Educ. Psych.*, 37, 1 (1946).

⁵ Ash, P., and Carlton, B. J., *Brit. J. Educ. Psych.*, 23, Pt. 2, 121 (1953).

⁶ Pegge, C. D., *Univ. Film. J.*, 1, 3 (1953).

⁷ Carpenter, C. R., *Prog. Rep. Penn. Film Res.* 11 (1950).

REDUCTION BY X- AND γ -RAYS OF SOME SUBSTANCES OF BIOLOGICAL INTEREST

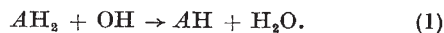
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IT is usually considered that the main primary effect of ionizing radiations on aqueous solutions is to form hydrogen atoms and hydroxyl radicals¹. In the presence of a solute which can be oxidized in two steps, the hydroxyl radicals may react according to:



We wish to present a number of instances where a second solute is introduced in a concentration so small that the AH_2 protects it from hydroxyl radicals, and the effects observed on the second solute must be due to the action of AH radicals or hydrogen atoms, or both.

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