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Art for Science's Sake

More can be done with science films for the classroom than simply providing every student with a good seat at a good lecture in a well-equipped lecture hall. A good lecture is a respectable achievement but the camera, if used imaginatively, can itself contribute something to telling a story. Just how much the camera can contribute may be seen in one of the films—perhaps in other films, too, but we have not viewed them all—made for the Physical Science Study Group's new high school physics course. The film is "Frames of Reference." It is 16 mm, sound, runs 26 minutes, and stars J. N. P. Hume and D. G. Ivey, of the University of Toronto.

The picture opens with a well-dressed, obviously intelligent chap telling us that much in life depends on one's point of view, one's frame of reference. A second chap, equally well-dressed and intelligent-looking—only upside down—enters the scene, coolly surveys the first chap, and accuses him of being upside down. The accusation is returned and the two men, true scientists that they are, agree to settle their differences by flipping a coin.

Dr. Upside-down (to us) flips first. His coin travels down toward the floor and then back up to his hand. Dr. Right-side-up (to us) flips second. His coin travels up and continues right off the screen and we hear a noise like that of a coin hitting the floor. During this time the camera has been pulling slowly back. The first chap, who we now see has been hanging by his knees from a bar, skins the cat and lands on his feet, while the camera, which we also now see has been upside down, rights itself.

With the same zest, the picture goes on to demonstrate the distinction between inertial and noninertial frames of reference, and the appearance of fictitious forces in a noninertial frame. Whenever a new idea is introduced, a feeling for the underlying problem is first created. There is humor, but it is not a distraction, for it develops directly out of the work of exposition. The two demonstrators, although they use the term "Doctor" in referring to each other, should impress a high school student as not being too different from some of the more affable adults he knows.

It is not difficult to see such a film as a meaningful part of a physics course. The student's intuition of a certain part of physics should receive a powerful bolstering. But no equations are introduced and no calculations are made. There is nothing quantitative in the presentation. And so there is still plenty for the teacher to do, besides answering the many questions the picture is bound to provoke.

The picture is an entertaining, informative lecture, but what we are suggesting is that it is also something more. What was done in the film studio could not have been done on the lecture platform. The camera is a part of the demonstration, being fixed now to one frame of reference and now to another, being now close to the action and now distant. But tricks are not performed simply to display the producer's ingenuity. It is typical that the picture is in black and white, since nothing more could be said by using color. "Frames of Reference" shows that the explanation of science on film can approach the making of a work of art.—J.T.