

SCIENCE IN FILM

Fitting Science and Screen

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In the mid-1920s, the great German film director Fritz Lang decided to make a movie about going to the Moon that would be more scientifically accurate than previous movies on space flight such as Holger-Madsen's *The Sky Ship* (Denmark, 1918) and Yakov Protazanov's *Aelita* (Soviet Union, 1924). So he did what every Hollywood director in the same position would now do: he hired some scientific consultants, among them rocket scientist Hermann Oberth. (A young Wernher von Braun also helped out on set.) To Oberth's dismay—so great that he threatened to quit the job—Lang insisted that his characters walk around on the Moon without space suits, despite the scientific consensus that the Moon had no atmosphere. Lang had his reasons: this was a silent film about a love story. It's hard to show affection through a space suit—and with no audio, it was especially important to be able to see the expressions on the actors' faces. Today, such an obvious transgression of scientific truth would provoke ridicule. But in 1929 the public didn't know any better. Lang knew that, and he made a shrewd calculation that the (then minor) benefit of being accurate was outweighed by the difficulties of silently expressing love through a deep-sea diving suit.

Lang's *Woman in the Moon* is one of the many examples of potential tensions between science and fiction that David Kirby discusses in *Lab Coats in Hollywood*. It illustrates a useful rubric for science-versus-art decision-making that he sets up, one I'll be applying in my own consulting work in the future. Kirby (whose work at the University of Manchester centers on science communication) defines "public science" as the kind of science that the majority of the public is likely to know. "Expert science" involves facts that, if disregarded, only provoke irate letters from people like readers of *Science*. "Folk science" is science that people think is true but isn't. Lastly, "unsettled science" covers the vast area where science is either silent or has not reached consensus.

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If something in a film violates public science, there's a substantial risk of the film seeming implausible. Because that could hurt the film's commercial success, a consultant who makes a good argument on this score can usually ensure a change toward scientific fidelity. If a movie violates expert science, however, many other considerations come into play: Does the director value scientific accuracy? Is the suggested change expensive? Will it reduce the drama of the film? Here, Kirby

argues that the consultant has to be creative in providing a scenario where fidelity to truth will enhance, rather than detract from, the narrative. On this score, Oberth's logic was no match for Lang's narrative wisdom.

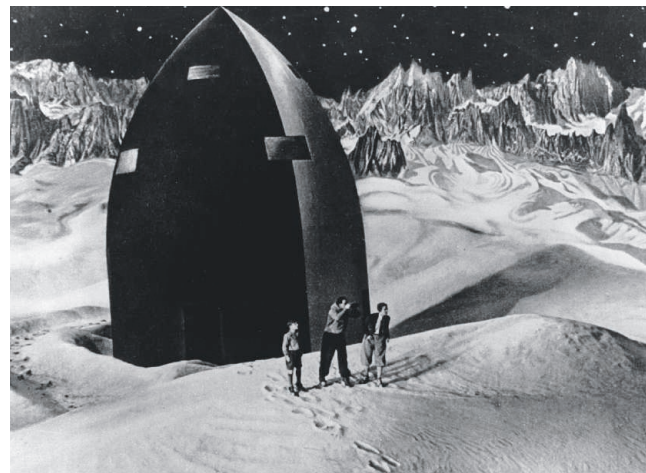
When it comes to folk science, the default position is to sacrifice scientific accuracy. Kirby gives the example of people's expectation that a lab will contain bubbling flasks of colored liquids. The directors he talked with know this stereotype to be false, but they often find that violating the expectations of the audience isn't worth the price. Sometimes directors decide that disagreeing with folk science is worthwhile. *Jurassic Park* broke with the popular belief that dinosaurs were large, slow, and stupid animals, and Kirby details the extraordinary publicity efforts to prepare the audience. When it comes to unsettled science, consultants get the freedom to be creative—or, in some fascinating and ethically thorny cases Kirby describes, put forward their own pet theories as settled truth.

In the book, Kirby balances thoughtful analysis with a wealth of well-researched anecdotes that reveal a previously hidden but important part of the culture of science. These stories will appeal not just to those involved in science and cinema, but to anyone who is curious about the ways scientists have contributed to popular culture. We learn, for example, that Kubrick's obsession with scientific realism in *2001* brought him to employ people from a vast array of technical disciplines, including space science (Frederick Ordway), artificial intelligence (Marvin Min-

sky), and supercomputing (the statistician I. J. Good, originator of the idea that we now call "technological singularity").

Perhaps the most intriguing point Kirby makes is that science consultants should choose their battles more wisely than they have in the past. He suggests focusing less on transgressions of scientific accuracy and more on the cultural meanings of science conveyed by the work. Seeing movies as a vehicle for improving science literacy, he claims, is a lost cause. There are too many ways in which scientific accuracy (particularly in the realm of expert science) has to give way to storytelling expediency. However, as Kirby illustrates with a number of cases, the cultural meaning of science offers an area where the science consultant has the potential to powerfully influence writers or directors. Showing scientists as creative people, or its process of inquiry as our most effective approach to understanding nature, for example, can have far more impact than ensuring that a particular dinosaur is depicted with the correct body shape.

As France's art-roboticist extraordinaire François Delarozière has written, "dreams are what fuel the greatest human adven-



Consultants overruled. Space suit-free travelers in Fritz Lang's *Woman in the Moon*.

tures" (1). For those of us wanting to work with story makers to bring those dreams into cinematic reality, *Lab Coats in Hollywood* is an invaluable guide for how to do it with the right measure of scientific validity. For movie-lovers everywhere, it provides a fascinating behind-the-scenes look at how art and science meet in producing motion pictures we find delightful.

References

1. F. Delarozière, *Carnets de croquis et réalisations: Edition bilingue français-anglais* (Actes Sud, Paris, 2010).

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