

Chapter 10

THE ACTUAL CAUSE

*And now remains
That we find out the cause of this effect,
Or rather say, the cause of this defect,
For this effect defective comes by cause.*
Shakespeare (Hamlet, II.ii. 100–4)

Preface

This chapter offers a formal explication of the notion of “actual cause,” an event recognized as responsible for the production of a given outcome in a specific scenario, as in: “Socrates drinking hemlock was the actual cause of Socrates death.” Human intuition is extremely keen in detecting and ascertaining this type of causation and hence is considered the key to constructing explanations (Section 7.2.3) and the ultimate criterion (known as “cause in fact”) for determining legal responsibility.

Yet despite its ubiquity in natural thoughts, actual causation is not an easy concept to formulate. A typical example (introduced by Wright 1988) considers two fires advancing toward a house. If fire *A* burned the house before fire *B*, we (and many juries nationwide) would surely consider fire *A* “the actual cause” for the damage, though either fire alone is sufficient (and neither one was necessary) for burning the house. Clearly, actual causation requires information beyond that of necessity and sufficiency; the actual process mediating between the cause and the

effect must enter into consideration. But what precisely is a “process” in the language of structural models? What aspects of causal processes define actual causation? How do we piece together evidence about the uncertain aspects of a scenario and so compute probabilities of actual causation?

In this chapter we propose a plausible account of actual causation that can be formulated in structural model semantics. The account is based on the notion of *sustenance*, to be defined in Section 10.2, which combines aspects of necessity and sufficiency to measure the capacity of the cause to maintain the effect despite certain *structural* changes in the model. We show by examples how this account avoids problems associated with the counterfactual-dependence account of Lewis (1986) and how it can be used both in generating explanations of specific scenarios and in computing the probabilities that such explanations are in fact correct.