29. Bell’s Theorem

Now that you understand what a “singlet” state is, you are ready to understand Bell's theorem. This theorem more or less proves that when we say a quantity is “undefined” or “indeterminate” in quantum mechanics, we don’t merely mean that we don’t know its value—we mean that its value truly does not exist.

The best explanation of Bell’s theorem is David Mermin’s 1985 article in *Physics Today*, “Is the moon there when nobody looks? Reality and the quantum theory.” I will hand out copies of this article in class, but you can also find an online version linked from our course web page. I hope you will make time to read the whole thing, but if for some reason you cannot, then please focus your attention on the middle part of the article, starting with the section “A gedanken demonstration” and continuing through the section “One way to do it.”