Sound was first recorded and reproduced by Thomas Edison in 1877. Until about 1950, when magnetic tape use became common, most recordings were made on mechanical media such as wax, foil, shellac, lacquer, and plastic. Some of these older recordings contain material of great historical value or interest but are damaged, decaying, or now considered too delicate to play.

This talk will begin with a discussion of the history and technical basis of sound recording and the issues faced by archives and libraries as they strive to preserve, and create greater access to, these valuable materials. Recently, a series of techniques, based upon optical metrology and image analysis, have been applied to restoring historical sound recordings. This approach, current results, and prospects for the future, are the focus of this talk and will be illustrated with sounds and images.