You are sitting in front of a screen. The screen may be part of a digital audio work station, or it may be the screen of a laptop. You press a key and watch as the cursor moves through the waveform. You hear the sound at the same time as you see it traversed by the cursor. You decide to retrieve a sample, which you’ve stored in the computer. It’s located way up ahead of the present waveform: in a few seconds you’ve scrolled forward, claimed the sample and positioned it next to the waveform. You magnify the image, to get a better ‘look’ at the sound. You decide to insert the sample into the waveform, trying various positions. If you change your mind, nothing is lost: this is, after all, non-destructive editing.

This chapter examines digital audio technology – including sampling, editing and mixing – as an ‘intellectual technology’. In Pierre Levy’s words, such a technology modifies the ‘cognitive ecology’ into which it is introduced.¹ Digital audio shares the properties of other digital technologies: it is founded on the immaterial (information); this information is endlessly manipulable. These properties form the basis of an intellectual economy, in which familiar epistemological categories – including intellectual property and the codes of realism – are challenged. Digital audio adds to these general properties its distinctive re-alignment of the technological reproduction of sound. The digital audio user works with sound in a specific manner, particularly with regard to time. The focus of this chapter is on the consequent refiguring of our conceptualisation of sound, in terms of time.
Mathematical time

Digital audio is fundamentally a numerical technology. Unlike analogue audio, which creates an analogue of the waveform in various media (voltage control, deviations in a groove, magnetic patterns on tape), digital audio represents a sound event as a set of numerical values. This binary data is processed and stored – as information – to be reconverted to the original waveform at the point of output. The most cited advantages of the digital process are its lack of degradation in copying, its ability to error-correct and its flexibility in editing. All these advantages derive from the fact that digital audio works with an immaterial stream of data – with numbers.

Discrete time sampling has been called ‘the essence of digital audio’. This technique encodes the analogue waveform into infinitesimal pieces of information. Each slice is discrete in time; the standard 44.1 kHz sampling rate means that 44,100 time-samples per second are taken of the waveform. An analogy used to describe this process is the technique of cinema: the 24 discrete frames per second of film merge to reproduce images of movement. Digital audio takes 44,100 discrete snaps per second, to reproduce variations of sound in time.

Such a description of this technology invokes Bergson’s philosophical treatment of time (discussed in more detail in Chapter 2). Writing at the beginning of the twentieth century, Bergson drew a distinction between time as constructed by the intellect, and duration as glimpsed by intuition. The former, which he variously termed scientific or mathematical time, is a succession of instants divided by the pragmatic faculty of intellect. In a famous analogy, he likened the workings of intellect – cutting up movement into discrete moments – to the cinema apparatus, taking ‘snapshots... of the passing reality’. Each frame represents a static point, isolated from the flow of movement: this is the ‘cinematographic illusion’ perpetrated by intellect. It is only through intuition that this illusion can be overcome, that ‘the infinite multiplicity of becomings’ can be grasped.

Yet in his *Cinema 1: The Movement-Image*, Deleuze salvages the cinema from Bergson’s ‘rather overhasty critique’ appraising the artform in Bergsonian terms. At the same time, he deploys cinema as a mode of thought, with its own concepts. In the same way, digital audio may be approached, from a Bergsonian perspective, in more