The human body was made legible long ago. But what of the human mind? Is it possible to 'read' the mind, for one human being to know what another is thinking or feeling, their beliefs and intentions. And if I can read your mind, how about others – could our authorities, in the criminal justice system or the security services? Some developments in contemporary neuroscience suggest the answer to this question is 'yes'. A range of novel technologies of brain imaging have been used to argue that specific mental states, and even specific thoughts, can be identified by characteristic patterns of brain activation; this has led some to propose their use in practices ranging from lie detection to the assessment of brain activity in persons in persistent vegetative states. This paper reviews the history of these developments, sketches their scientific and technical bases, considers some of the epistemological and ontological mutations involved, explores the ecological niches where they have found a hospitable environment, and considers some forms of expertise of the readable, knowable, transparent mind that are taking shape. How should one respond to the new materialism that is taking shape