

**P Matthews and J McQuain,  
The Bard on the Brain,  
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As Dr Johnson wrote in his Preface, “Shakespeare is above all writers the poet that holds up to his readers a faithful mirror of manners and of life... His persons act and speak by the influence of those general passions and principles by which all minds are agitated.” As such his works can be seen as a compendium of behaviours and feelings that a mature science of the mind should seek to explain. But who should be doing the explaining? Since ancient times, the wellsprings of human action have been the object of philosophical study as well as the inspiration for artistic creation, and as disciplinary boundaries have shifted, so their proper description has fallen to successive groups of professionals. Towards the end of the 20th century, psychology held the ball, but was for the most part unwilling to look inside it; behaviour was the consequence of processes that remained hidden within the black box. On the other side of the fence, neurobiology was largely content to document how a brain in a vat (or an anaesthetised preparation) responded to stimuli largely devoid of real-world meaning. As with most “scientific” developments, it is new technology that has enabled the boundaries to be redrawn. It could be argued that cognitive neuroscience, where psychology and neurobiology now meet, is a theoretical domain built on a purely practical advance: functional brain imaging. Initially with PET, and now mostly with functional MRI, researchers exploit the mechanisms regulating cerebral blood flow and metabolism in response to changes in neuronal firing and use EEG and magnetoencephalography to measure the electrical activity more directly. Maps of functional anatomy from in vivo brains engaged in a bewildering range of activities are now routinely obtained in dozens of centres around the world. Although the techniques are very expensive and very complicated, the ease with which a study can be done in a well run facility has led to a vast range of data being generated and to a burgeoning attempt to elucidate the biological mechanisms underlying Shakespeare's passions and principles.

The Bard on the Brain—by Paul Matthews, a neurologist who directs the Oxford Centre for Functional Magnetic Imaging of the Brain, and Jeffrey McQuain, an author and researcher in literary studies—is a handsome volume that compares classical speeches from Shakespeare with classic and more recent studies of brain function. Those who have studied either Shakespeare or brain imaging will find many favourite

stories reanimated here. There are pleasing illustrations of Shakespearean scenes (Hollywood actors do seem to find period costume very uncomfortable) and clearly explained illustrative functional brain maps. Some of the more “artistic” renderings of the imaging data threaten to detract from, rather than to enhance, clarity, but these are minor quibbles. This is an authoritative and economical description of results that illustrate the full range of neuroscientific examination of human behaviour from perception to action. Topics as diverse as bilingualism and alcoholism are sketched with deft hands, and the transition in each short chapter between the gloss of the literary text and that of the science is seamless throughout.

Johnson was against the illumination of Shakespeare's work with excerpts: “he that tries to recommend him by select quotations, will succeed like the pedant in Hierocles, who, when he offered his house to sale, carried a brick in his pocket as a specimen”. But this book is not trying to convince the reader of Shakespeare's genius. A more serious worry is that the connection between the speeches and the imaging data is sometimes tenuous. The comical Fluellen in Henry V claims that “Macedon and Monmouth ... is both alike. There is a river in Macedon; and there is also moreover a river at Monmouth ... and there is salmons in both.” There is also a bit of a stretch from Brutus in Julius Caesar calling for silence to “count the clock” to a recent study of numerical cognition. And what mutual light is cast between Orsino's “If music be the food of love” from the opening of Twelfth Night and the recent finding that musical dissonance affects a brain area previously associated with responses to unpleasant stimuli is unclear. The text is beautiful, the experiment is described with exemplary clarity, and there is music in both, but the gap between them is not satisfactorily bridged. Today's brain research addresses a range of questions that would have been unthinkable even 10 years ago. Nevertheless, between the insights offered by the playwright and those of the scientist it is still science that comes off poorly. For all the marvellous insights that our new found instruments afford, the experiments are cartoon renditions of the sophisticated and universal truths that Shakespeare anatomises. In this sense our current understanding could perhaps be illustrated using any broad-brush characterisation of human behaviour. We may be closer now to explaining the world of Shakespeare than we have ever been, but scientifically we are still firmly in the realm of The Simpsons and our efforts better match.

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