nature neuroscience

The public face of neuroscience

If the research enterprise is to thrive, it must not only deliver practical benefits, but also capture the popular imagination. A New York-based public television station has just released an ambitious new series, *The Secret Life of the Brain*, which aims to convey the excitement and achievements of modern neuroscience to a broad general audience. Made by Emmy-winning producer David Grubin, with an accompanying book by the popular neuroscience writer Richard Restak, the series is likely to be widely viewed, and may have a significant influence on how neuroscience is perceived by the public.

In many ways, the series provides an excellent snapshot of the field. Each of the five episodes presents one chapter in the life story of the brain, from birth to childhood, through the teenage years to adulthood and old age. The science is accurate and up-to-date, thanks in part to the many prominent neuroscientists who were interviewed. Perhaps wisely, the producers avoid introducing too much detail. Television is often better at conveying impressions and emotions than at presenting complex logical arguments, and the producers play to these strengths, never letting technical issues detract from the human drama of the subject. In the fourth episode, on the adult brain, Antonio Damasio argues against the traditional separation of thought and emotion, and his dictum "We are not thinking machines, we are feeling machines that think" might have been the producers' motto.

The series opens with Emily Dickinson's poem *The brain is wider than the sky,* and the final episode ends with a moving recitation by the 95-year-old American poet laureate Stanley Kunitz. The whole series is overtly poetic in its intentions, beautifully produced and full of evocative stories and images. Some are tragic—a woman holding back tears as she describes how her husband lost his capacity for emotional understanding following a stroke 23 years ago. Others are uplifting—children whose determination helped them recover after losing half their cortex to epilepsy; or writer Lauren Slater, who overcame suicidal depression to write a widely acclaimed book describing her experiences. The brain's life-long plasticity offers the hope of new therapies for many conditions previously regarded as untreatable, and this optimistic message is the central theme of the entire series. Although intended for a lay audience, basic neuroscientists who seldom encounter patients will find here a powerful reminder of the human dimension to their work.

Nevertheless, although it is carefully balanced in some ways—notably the many interviews with prominent women researchers—*The Secret Life of the Brain* suffers from several flaws. First, it is unremittingly 'America-centric'. The scientists who appear here are almost exclusively US-based, and the contributions, past and present, of Europe, Japan, Australia and other countries are never acknowledged. Similarly, to refer repeatedly to the "millions of Americans" suffering from various brain disorders is to ignore many more who live elsewhere. It is true that the US invests more in neuroscience research than any other country, and that it represents the largest potential market for the new treatments that the series promises. It is perhaps understandable that the program's sponsors—which include the National Science Foundation and Pfizer among others—want to reach American voters, consumers and (with luck) philanthropists. But the US surely has enough isolationist tendencies without having them echoed in its science documentaries.

The series also downplays the importance of animal research. There is one striking moment when the narrator describes Mriganka Sur's experiments on the rewired ferret cortex as the camera moves across Leonardo's portrait *Lady with an Ermine* (the animal is actually a ferret), inviting viewers to ponder the similarities and differences between the sitter and her pet. But apart from this scene, animal experiments are hardly mentioned. The emphasis on human-interest stories is understandable, but the naive viewer will have no idea that animal experiments have been critical in almost every discovery described here. At a time when public opposition to animal research poses a major threat to the future of the field, this seems like an important omission.

Finally, the focus on cognitive neuroscience and its practical implications means that many of neuroscience's greatest achievements and most important questions are never mentioned. Studies of language, emotion and drug craving make good stories, but some of the hypotheses explored here—for instance, the link between teenage waywardness and late maturation of prefrontal cortex—are tentative at best, and the program does not convey how much the frontiers of cognitive neuroscience depend on a rigorous foundation of cellular and molecular research. The graphics depict neural pathways as pipes and sprinklers that convey happy, sad or fearful signals across the brain, but although the program pays the usual lip service to the brain's vast complexity, it offers no insight into how networks of neurons might operate. The neural underpinnings of perception, decision-making and consciousness, with their attendant philosophical questions, are not discussed at all. A lack of respect for reductionism is reflected in the synapse animations, which are graphically sophisticated but fundamentally misleading—neurotransmitter molecules are shown migrating purposefully as if animated by some unseen intelligence, rather than diffusing according to the familiar laws of physics. An opportunity was lost here to convey the idea of neurons as machines that obey natural laws, and thus to suggest continuity between mind and inanimate matter.

The idea that 100 billion neurons can give rise to human mental life is, as Francis Crick has said, an astonishing hypothesis. Perhaps the producers of *Secret Life of the Brain* thought it was too much for their audience, but this would have been an even better series if it had tried to confront the central mysteries of neuroscience head-on.