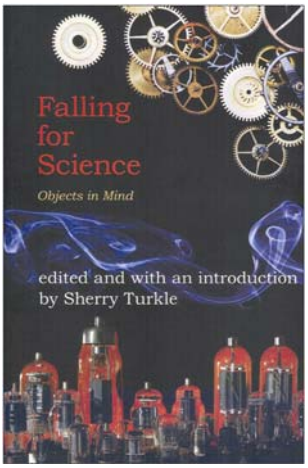

Falling for Science: Objects in Mind. Sherry Turkle (ed.). The MIT Press, Massachusetts Institute of Technology, Cambridge, Massachusetts 02142, USA. 2011. xii + 318 pp. Price not mentioned.

An apple fell, Newton discovered gravity. Archimedes fell, buoyancy was understood. A meteor fell, and possibly wiped out dinosaurs. What happens when one falls in science? The book under review presents one of the means by which this plunge happens – through objects. According to the editor Sherry Turkle: '...I have learned that the wand chooses the wizard and the wizard chooses the wand, a perfect image for the magic that happens when young scientists find their object and their objects find them.' She talks of the importance of objects in the development of a love for science.

Turkle showcases the experiences of some students and mentors at the Massachusetts Institute of Technology (MIT), USA, for whom objects during childhood triggered scientific curiosity. These stories are intended to inspire others. Part 1 of the book is a collection of 51 chosen essays by MIT students over a period of 25 years (1979–2007), while Part 2 is a compilation of the memoirs of eight mentors. The essays under both sections are divided into the following themes: What we see (e.g. maps and prisms), sense (e.g. sand castles and bubbles), model (e.g. wood stoves and vacuum tubes), play (e.g. keys and marbles), build (e.g. bikes and lasers), sort (e.g. cards and stop signs) and program (Apple II and BASIC).

The book is dedicated to Seymour Papert, a pioneer in enabling creative learning in children through computers (see http://www.papert.org/). In his essay, this mentor recounts how he 'fell in love with the gears'. According to another mentor Donald Norman, 'I loved the insides of the radio... the radio transformed my life.' The introduction and epilogue by Turkle provide a good background to a novice to this topic. Among others, she talks of analog versus digital objects; personal thinking styles; object choice, intimacy, mastery and space; and role of objects in improving science education. Turkle mentions that: 'Children find physics in the collision of LEGO ships, mathematics in the motion of a fly rod, geology in the viscosity of a meringue'.

In the stories of the scientists in this book, certain features stand out: disassembling and reassembling, taking objects apart, making mechanisms transparent, wanting to look inside, curiosity, discovery, elation, seeing something new, constructing/building/modelling. Turkle notes that 'Objects do not determine the particular ideas they inspire. Sometimes the most important thing they inspire is the feeling of having a "charge", a "thrill" or a "secret theory" that leads children to want to have more.'

Student Kwatsi Alibaruho shares his journey from erector sets to LEGO blocks to telephones to bicycles to electric guitars to computer programs to cybernetics, some common underlying traits being his 'need to connect through understanding structure' and beginning his project 'with a visual mental model'. Student Erica Carmel recounts how she unknowingly followed the scientific method at age five, in an experiment with an Easter egg basket in her playroom and discovered centripetal force.

The kitchen clock taught student Emmanuel Marcovitch numbers up to 60, at age four. He wonders: '...what if my parents had put a barometer instead of a clock on the kitchen wall? Would I have been able to learn numbers up to one thousand and above?' The clock also taught him the notion of symmetry, mirror images, and the order of numbers – something that helped him later in learning trigonometry. Playing games with marbles in kindergarten taught student Kwan Hong Lee basic accounting and saving, helped him in understanding pair theory later, taught him complex strategies and geometry, and made him think about trajectory, rolling distance and friction.

The Holga camera taught student Andrew Sempere, in his final year of high school, that 'to be an artist or a scientist implies a willingness to act as an observer, to keep a record that does not seek to eliminate the blurry edges, dark spikes, and imperfections, but rather celebrates them.' Student Joanna Berzowska's object was her body – she used her footsteps to measure distances, her hands to describe parabolas and her fingers for addition. Now her team works on electronic textiles and responsive garments. According to student Anthony Townsend, 'That humble ModemPak changed the way I thought about the world.' Through it, he understood networking of personal computers.

For mentor Susan Hockfield, the microscope brought 'a new route for understanding the living world'. She understood function through structure. She started with a magnifying glass to take things apart, graduated to a microscope and is now President and Professor of Neuroscience at MIT. Speaking of Charles H. Townes (inventor of the laser) and his wife (both of them almost 90 years old), mentor Rosalind Picard recalls: '...I got to see the spirit of playfulness with which both of them still spoke about science and the process of discovery—the very thing that had been missing in my early "cookbook" days as a student, the thing that had crept in little by little with the furry penguin and the purple haze and the cameras and holographs and vibrating strings, all of the cool and concrete things that turned me into the girl who loved to play with science, the lucky girl driving across town with a laser and a parachute in her car.'

A major appealing factor of this book is the size and content of the memoirs – neither too short nor too long; neither flimsy nor complicated. Turkle incorporates quotes from successful scientists in the text. Ample notes, bibliography, suggested readings and an index have been provided. This interesting and inspiring book would be suitable for school-going and undergraduate students, parents, school teachers and child psychologists.

A remark by Turkle is worth remembering, 'A one-kind-fits-all curriculum is likely to take children away from the objects that compel them.'

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