

The status quo is maintained. The age-old power structure, involving scientific communities and bureaucrats, is retained, and those in power continue to control the distribution of funds. The personnel change, but their successors are always chosen from people who conform to this tradition. This basic structure has never really altered.

How can it be changed? Ryoji Noyori, Nobel laureate and president of RIKEN, the Institute of Physical and Chemical Research, believes that Japanese graduate education must be restructured to produce better young scientists who can work independently and who are able to interact with other scientists both in Japan and abroad. Accepting more young, foreign scientists in Japanese educational and research institutions would also make Japan more open and international.

The theme of the book is that Japan must become more competitive. Kishi describes many faults in the Japanese system and persuades the reader of their validity. He warns eloquently that Japan's survival depends on the accumulation of intellectual property to build a nation based on science and technology. However, scientific knowledge should be shared by everyone, and the book does not address the need to temper international competitiveness to foster international cooperation rather than confrontation. The role that Japan should play in the global arena, and especially in Asia, is also neglected. But despite these criticisms, it is certain that this book will have a great effect on the Japanese scientific community. ■

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Museum collection

A taste of their own medicines

It became a tradition at the University of Florence's Institute of Pharmacology and Toxicology to assemble all manner of drugs and medicines. After all, reasoned the institute's directors, you never know when a researcher might become interested in a particular therapeutic group.

The hoard has recently been recognized as a collection of considerable historic interest, and much of it has now been catalogued by Piero Dolara and Graziana Fiorini, researchers at the Italian institute.

The catalogue, which has been written in both Italian and English, is available from Firenze University Press and online at <http://digital.casalini.it/8884532183>. It describes the drugs and provides a short history of experimental pharmacology.

The collection comprises more than 600 hand-blown glass jars from around the world, containing, for example, some rare Arabic



preparations made from medicinal plants. Most of the drugs in the collection are from botanical sources. Several, such as quinine, digitalis, aspirin, morphine and cocaine, are still in use.

But the catalogue throws out a caution to romantics who prefer the concept of 'natural' medicine to synthetic pharmaceuticals. Many of the botanical preparations would have been ineffective, or toxic, it notes. **A.A.**

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Positive thinking

Exuberance: The Passion for Life

by Kay Redfield Jamison
Alfred Knopf: 2004. 416 pp. \$24.95

Daniel Nettle

What quality is shared by the great innovators and leaders in science, arts and public life? What characteristic is common to such restless and inspirational figures as Theodore Roosevelt, Richard Feynman, Humphry Davy and James Watson, the co-discover of DNA? Jamison believes that there is a common thread in these disparate psyches, and she calls it 'exuberance'. She describes this as an intersection of various different capacities: boundless optimism, energy, an ability to captivate others, a sense of joy, and a continuation into adulthood of the child's capacity for wonder and play.

Readers may be familiar with Jamison's memorable previous books, on bipolar disorder (*Touched with Fire*) and suicide (*Night Falls Fast*), and her memoir (*An Unquiet Mind*). This latest book, *Exuberance*, draws as ever on a wide range of biographical and literary, as well as scientific, material. The link with her work as a psychiatrist is also clear, as the positive attributes of exuberance — energy, restlessness and optimism — can easily tip over into the pathology of clinical mania. Moreover, the highly exuberant are often prone to intermittent bouts of deep depression. Here, as in *Touched with Fire*, one is reminded that, as Dryden put it: "Great wits sure are to madness near allied/ And thin partitions do their bounds divide."

Jamison writes poetically, as ever, and many of the portraits and literary examples



Up to scratch: the exuberant Richard Feynman.

are highly engaging. But I must confess that the book seemed to me to be limited by its lack of a strong underlying thesis. Jamison relies on the rather old-fashioned idea that emotions basically come in two types: negative ones, such as fear, worry and sadness; and positive ones, such as joy, enthusiasm, wonder, and so on. Exuberance then becomes simply having the capacity for all the positive emotions in ample dose. Psychologists no longer view emotions in this way, however. Emotion systems are probably better seen as discrete mental programmes, each with different design features and content. Fear is quite different from anger, even though both are negative, and it would be possible for someone to be temperamentally high on one but not the other. Similarly, joy is quite different from, for example, ambition, desire or openness to experience. At one point, Jamison says that happiness is a dilute version of exuberance, but it is far from clear that this is the case, because great innovators are often driven by dissatisfaction rather than well-being.

Jamison lumps all emotions that either feel positive or that she judges to have positive effects into one category, so we are left with an undifferentiated view of what really typifies the exuberant individuals of her study. Often it may be the combination of extraversion, which accounts for the ambition and socially captivating behaviour, and neuroticism, which keeps them worrying away at problems for so many years and leaves them vulnerable to depression. In truth, it could be that there is no single psychological trait common to all the highly diverse figures profiled in the book.

A much deeper problem is that Jamison is impartial, almost hectoring at times, as she evangelizes the many benefits of exuberance (though, to be fair, there is one chapter on the drawbacks). She believes the trait to be genetically based, and strongly advantageous, so one naturally wonders why exuberant

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individuals constitute only a small minority of humanity. She addresses this question only in passing, with a whiff of group selection: "We vary in our capacity for enthusiasm, because a diversity of temperaments serves the collective good." But we know that evolution favours individual fitness, not the collective good. A more interesting story would explore the possible fitness disadvantages of optimism under some circumstances and advantages under others, leaving the population polymorphic, but Jamison doesn't really develop this possibility.

In the absence of a well worked-out model or evolutionary thesis, one is left with little more than descriptions of the exuberant lives. These are certainly vivid, but the prose often takes on a purple hue and the book is extremely repetitious. It may be my own phlegmatic temperament, but I was longing to see some sober hypotheses or experiments, and I was wearied by the constant explosion of the verbal sky-rockets: colourful, yes; eye-catching, certainly; but they tended to fizzle out and leave nothing lasting in the sky. ■

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Stemming the tide of turtle extinction

Sea Turtles: A Complete Guide to their Biology, Behavior, and Conservation

by James R. Spotila
Johns Hopkins University Press: 2004.
240 pp. \$24.95

Graeme C. Hays

Humans have a history of driving once abundant species to extinction. The passenger pigeon is thought to have once been the most abundant bird on the planet, with several billion in North America when Europeans arrived. But by the end of the nineteenth century the species had been exterminated through hunting and habitat loss. Extinctions approaching this magnitude may be under way with some sea-turtle populations. It is estimated, for example, that there were tens of millions of green turtles in the Caribbean when Columbus arrived in the fifteenth century, but human harvesting has since reduced this number by around 95%. Some populations have already been driven to extinction: the last green turtles nested in Bermuda in the 1930s.

The survival of sea-turtle populations is now dependent on conservation efforts. In the late 1990s I was part of a group that travelled to Ascension Island to assess the status of the nesting green-turtle population. To



Hatching a plot: conservationists have acted to save the Kemp's ridley sea turtle from extinction.

our pleasant surprise we recorded thousands of nests each year and found that this population had grown since the previous census 20 years before, a success story reflecting conservation efforts both at Ascension Island to protect breeding turtles and in Brazil where these turtles forage. This same positive outlook has been reported elsewhere. For example, monitoring of green-turtle populations in Hawaii and Costa Rica for the past 30 years has revealed upward trends at both sites.

We can rejoice in these demonstrations of just how effective conservation measures can be: they provide living testimony that the tide of sea-turtle decline can be stemmed. But we cannot be complacent, warns Jim Spotila in his book *Sea Turtles*. Many sea-turtle populations continue to suffer high mortality at the hands of humans, and the spectre of population extinction still looms large.

This lavishly produced book is filled with numerous excellent photographs of sea turtles in their various habitats, as well as beautiful schematics of anatomy and distribution maps. But this is much more than just a coffee-table book: it also deserves space on the academic's bookshelf. Spotila has been a front-line turtle researcher for many years and his extensive knowledge is evident throughout, with clear descriptions of sea-turtle physiology, ecology and threats to conservation. Along the way we read a fascinating account of how "perhaps the greatest zoological puzzle of the last century" was solved. I won't spoil your enjoyment by telling you more. Detailed information on the biology of each species is accompanied by case studies illustrating how beach development, collection of eggs, directed killing of turtles for their meat and shell, and incidental capture have contributed to the demise of various populations.

Often topics are covered with particular reference to Spotila's own work, giving parts of the book an autobiographical feel. The text is infused with human-interest stories

and stand-alone biographies of prominent conservation workers. These personal accounts help bring the material to life, broadening the target audience compared with more specialist volumes such as the *The Biology of Sea Turtles* (CRC Press, 1997, 2002). Spotila describes, for example, his team's perilous first attempts to radio-track turtles from an old inflatable boat held together with duct tape. And his account of Anne Meylan's work on the diet of hawksbill turtles ends with the sad postscript of how sponge spicules embedded in her fingers led to her losing her right hand.

Although the book is generally up to date, I felt more could have been done to enthuse readers about how the past decade has seen technology (for example, satellite tracking and depth-recording devices) revolutionize our understanding of the free-living behaviour of sea turtles. In the main, only early work in this area by Spotila's own group is covered in detail. Also, at times one is left with a forlorn view of the prospects for sea-turtle survival. For example, leatherback turtles face the gauntlet of literally millions of hooks deployed each day on longlines set for tuna and swordfish. Spotila describes how the search for an answer to this problem "is going slowly", but there is important recent work showing how changing hook and bait types can greatly reduce turtle bycatch without affecting the catch of target species.

In general the book gives far more space to conservation concerns than to conservation successes, but it is success stories that inspire the legions of conservation workers around the world by showing that their efforts can reap dividends. These are small criticisms, however. This beautifully produced book deserves to be widely read to achieve its main aim of alerting people to the many threats facing sea turtles. ■

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