



California burning: US wildfire policy is caught up in a greater clash over the value of wildlands.

public wildlands of the western United States, which are the scene of catastrophic wildfires wrought in equal part by nature and by the putative failings of the people charged with their management. The “pyric transition” — the switch from ‘natural’ biomass fire to the industrial use of fossil fuels — is briefly recapitulated. Pyne recounts its progression from “free-running” fire, experienced by indigenous peoples, to European colonial exploitation (including overgrazing, clearing, logging and mining), the creation of reserves, and the advent of bureaucratic command and control.

The core of the book is an account of the four fundamental pillars of fire management: suppression, ‘let burn’, prescribed fire, and fuel treatment. Pyne counsels that relying on any one alone is doomed to failure, as history has shown. They all have their place in solving the fire problem, but in what particular mix? Beyond noting that different mixes are likely to be required in different ecosystems at different times and places, Pyne offers no comprehensive solution.

His vision, focused on ponderosa pine forests, is heavily qualified. Forceful arguments, such as the need for mechanical thinning and the re-introduction of surface fires, are tempered by caveats. For example, wildfires are inevitable and serve useful ecological purposes, and anyway, the best solution depends on the locality, as crown fires may be required in chaparral and high-altitude conifer forests. At times the juxtaposition of solutions is breathtaking: devolution of planning responsibility to the community on one hand, with increased government regulation of urban design on the other. Pyne does, however, paint a slick picture of climate change and the consequences of burning fossil fuels, and of the international pressures that may be brought to bear on US

fire management to reduce emissions.

Ultimately, *Tending Fire* succeeds as a visceral and widely accessible account of the problem of wildfires. Pyne does not solve it but lays it out in all its maddening, self-contradictory splendour. His attempts to sketch a way forward, although useful, amplify the paradoxes and the choices available. Wisely, he counsels that, at best, both art and science can illuminate the consequences of differing choices but are not surrogates for decision-making.

The book concludes with a call for a biological theory of fire. This is a noble effort but the sketch offered is disappointing. The nostrum that fire is a by-product of life (biomass) is useful, but falls short. Fire is frustrating because we do not properly understand how it works at the spatial and temporal scales at which we confront it. Physical and ecological knowledge is shackled within micro-scale, reductionist paradigms that are inadequate for understanding fire and its consequences on a larger scale. Coping with fire is about understanding and manipulating forms of heterogeneity and biophysical feedbacks that we have barely grasped and that are not amenable to ‘bottom-up’ scientific enquiry. It is about recognizing that fire poses both risks and benefits at several levels. Compromises and trade-offs must be engineered accordingly, but the functional knowledge required for effective management is lacking. Fire is a transcendent phenomenon in both biophysical and socio-political senses. *Tending Fire* contributes to our awareness of this, but there is a long road ahead. ■

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Correction

In his review of Graeme K. Hunter's book *Light is a Messenger* (*Nature* **431**, 1037–1038; 2004), Kenneth C. Holmes stated that there was an error in Figure 0.2 in the book. In fact, this figure is intended to show a polychromatic, rather than a monochromatic, diffraction experiment, in which case the Bragg reflections are correctly displayed.