

In this issue

How physicists burn their fingers

'Does steam cause a more severe burn than boiling water?' asks M. D. Deshpande (page 235). The chorus, from generations of teachers and students of basic physics, brainwashed by the magic words 'latent heat' would be a resounding yes. Our author's first task is to show that this standard examination question has as many holes in it as the proverbial sieve. He then draws on the accumulated wisdom of fluid dynamics (Prandtl, Reynolds, Nusselt,...) to come up with and answer well-posed versions (the plural is significant) of the same question. And lo and behold, water causes the more severe burn in all the cases. But the goal is no mere one-upmanship over the pedants. One emerges with a new respect for real world problems and their refusal to fit into simplistic academic categories. A physicist would be additionally chastened by the sharp observation that his laboratory is a wilder, more uncontrolled place

than the chemist's!

R. Nityananda

Longevity and overcrowding: The case of the fruit fly

Ageing is inevitable and mortality is an inescapable fact of life. Understanding the factors that determine lifespan is the central concern of gerontologists. A grand unified view of ageing appears to be emerging as evolutionary biologists develop 'an approach that combines demography, population genetics and physiology'. Joshi and Mueller (page 255) use the fruit fly *Drosophila melanogaster* to address the effects of adult overcrowding on longevity. Their title points to the main conclusion – that there is an increase in age-independent mortality. This should surely strike a chord in societies struggling with enhanced population densities. The experimental protocol and statistical analysis provide clues as to the advantages of choosing the fruit fly as the subject of investigation. The authors report results which should excite the cu-

riosity of even non-biologist readers. For instance, female flies appeared to be affected by overcrowding to a greater extent than males, showing dramatically diminished longevity. Is discrimination based on sex an important feature? The authors hasten to add 'unfortunately too much cannot be made of these differences because the early death of large numbers of females in the crowded treatment would tend to increase life span in males due to reduced courtship and mating'. The authors conclude that 'adult crowding affects longevity by altering the age-independent mortality rate rather than the rate of ageing'. For females there is the trade-off between 'fecundity and longevity'. What is the underlying physiology that is responsible for the observed effects of overcrowding? Both depletion of lipid reserves and glycogen have been considered in other studies. A more elaborate picture will emerge only when physiological and biochemical analyses of the effects of overcrowding are undertaken.

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