

## In this issue

### Genetics in understanding anaesthesia

Serious limb injuries are a gruesome side-effect of the gruesome business of war. Excavations of ruins from ancient cultures in Central America and historical evidence from China and India strongly suggest that bone-setting, surgery and amputation were not unknown. In the Western world, the science of surgery developed by barbers being called upon to extend their practice from removing hair to slicing off arms and legs of warriors. While surgeons sharpened their knives and honed their skills with each war, they were usually regarded as mean characters; their job involved the screaming patient being held down and sliced. The absence of antibiotics and sterile conditions meant a good chance of death. Moreover, the intense pain of the surgery made the farewell to life a rather unpleasant process. Even rather minor forms of surgery such as pulling out a tooth, though less likely to result in death, caused great pain during the surgery (dentists do not care too much about the pain after they do their job, they just do not want to peer inside your mouth with a pair of pliers when they are being kicked in sensitive areas).

The discovery of anaesthetics such as ether and nitrous oxide (along with the widespread use of antibiotics) changed surgery and our world-view of surgeons. The Greek, Paracelsus, used ether to knock out animals, but this information was not used in surgery till much later. On 30 September 1846, Harold Wells, a dentist, applied ether to

himself and got a tooth pulled out in Harvard Medical School in the United States of America. He was assisted by a chemist from Harvard University. A few years later William Morton, also in the United States, used nitrous oxide as an anaesthetic during surgery. William Halstead, who helped greatly in the development of Johns Hopkins University Medical School, was one of the pioneers in developing mastectomy and injected cocaine during his operations. Apparently he used the drug on his patients and on himself too.

How do anaesthetics act? Do all of them act the same way? Do they all affect the same process? These questions have remained unanswered for long largely because they were intractable. Biochemical approaches were difficult to link to physiology and physiological studies provided few molecular handles. Genetic approaches to the study of the mechanism of action of anaesthetics promise to remedy this situation. Pigs are very similar in their physiology to humans and the genetics of anaesthetic action has made great progress using this animal system. The lowly nematode worm has also contributed to our understanding as has the fruit fly *Drosophila melanogaster*. Studies on anaesthesia in flies were pioneered by K. S. Krishnan and Howard Nash and in this issue Mir and Krishnan (page 1214) review the progress in this exciting new area. They discuss humans, pigs, worms and flies and show how anaesthetics probably act on the nervous system in very similar ways in these diverse organisms. Another example of how many

things are very similar even when they are very different.

K. VR

### Ending a debate

The proposal to establish a National Science University following an NRI initiative has elicited considerable comment in the pages of this journal. The premise that higher education in science is in a state of crisis and that research institutions in India are decaying was forcefully stated in the original proposal. Establishment of a new institution governed by a new set of rules, with substantial governmental inputs, was suggested as a solution in the original proposal, which also held out the promise of eventual privatization. In the correspondence received by this journal, there were few supporters of the NSU concept, although many did agree with the damaging assessments of the Mahajan proposal.

This issue wraps up the National Science University debate in a special section, which features a range of opinions and includes a rejoinder by one of the main proponents of the NSU (P. N. Srivastava, page 1190). The report of the committee set up by the government to 'concretize' the NSU proposal is also reproduced (page 1191). Irrespective of one's views on the NSU, there is little doubt that the proposal has stimulated a great deal of introspection on the state of science in India. This must augur well for the future.

P. B.