In this issue

Hottest April of the 20th century: The winner is . . .

One of the frequent complaints that is heard year after year about the weather is that it is becoming hotter and hotter, year after year. Since the same people say this every year, it would have been tempting to dismiss these impressions simply as an effect of growing old; after all, the children seem to be totally at ease playing under the scorching summer sun for the whole day, year after year. However, the complaints are also about winters being less cold, year after year. This, taken together with the fact that global warming is indeed inexorably making the climate warmer, makes one believe that there is indeed some truth in the perception of summers becoming hotter.

For something as objective and easily measurable (and regularly measured) quantity as the ambient temperature, one feels that it must be quite easy to settle these claims one way or the other by looking at the data. However, there are many ways of judging a day to be hotter than average. The average temperature of a day (e.g. mean of 24 hourly values) may be higher, the maximum temperature of the day may be higher, the minimum temperature of the day may be higher, or one may use some other equally valid criterion. The matter becomes even more difficult when one wants to decide if a month is hotter than the other; the number of 'hotter than average' days in a month becomes yet another equally appropriate yardstick. Secondly, to judge the hottest month for a region such as India, one needs to look at many different locations too, before arriving at an answer.

There can be no doubt that the coming April (April 2001) will enjoy the status of the hottest April of the twenty-first century – at least for the next one year, since it is the first April of the new century (in fact, of the new millennium). However, the more interesting question would be of deciding on the hottest April of the 20th century. In an informative and detailed article on (**page 867**) of this issue, S. R. Kalsi and R. S. Pareek of the India Meteorological Department, New Delhi, have awarded the title to April 1999, as there was 'unprecedented heat . . . most parts of north-west and central India recorded a maximum temperature of 40°C or above for about a fortnight, which is a record event of the century'.

The authors have carried out a detailed analysis of the temperature patterns seen at 28 stations in north-western and central India over the last century. They have identified 8 years with anomalously hot Aprils and have described the conditions in those months in detail. They show that of these, 1892 and 1999 were the hottest of the years, and point out both similar and contrasting features of the two. Though April 1892 was hotter of the two, the hottest April of the 20th century was in the year 1999. See the article for a more comprehensive and graphical (charts, figures, contour diagrams and tables) account of these hot spells.

N. V. Joshi

Narmada rift

Ancient rifts archive many episodes in the geologic history of a region – magmatic intrusions, faulting and earthquakes, among them. They are also considered as 'preexisting zones of weakness' which can be reactivated in the prevailing stress field. Many of our ancient rifts are seismogenic – Godavari, Narmada and Kuchchh rifts being the three best-known examples. Although these structures are expressed remarkably well on the surface, we know very little about what lies beneath. The paper by Tewari *et al.* (**page 873**) presents a reinterpretation of the Deep Seismic Sounding (DSS) data acquired along 5 profiles across the Narmada–Son Lineament (NSL), together with the observed gravity anomalies. The new analysis has identified three major phases of tectonism involving deep-seated faults and upwarp of the Moho. Some of the information that this paper presents is not exactly new, but the combined use of seismic and gravity data makes their interpretations more credible.

Seismic refraction surveys in many rift zones of the world indicate that frozen high-density bodies known as 'rift pillows' are common in many of them. Numerical models suggest that the presence of such high-density bodies can modify the regional stress field pushing a region to failure. Like many other ancient rifts in the world – Amazona in Brazil and New Madrid in the United States – Narmada rift may also be preserving frozen intrusive bodies. The present studies indicate high-density bodies at mid-crustal depths. Although the paper by Tewari *et al.* does not discuss the issue of seismicity of NSL, the results presented in their paper should provide the basis for modelling the stress field and for deeper probing of the structures within this important continental structure.

Kusala Rajendran

Sea truth validation

Satellite-based sensors have, during the last couple of decades, emerged as a major tool for observing the ocean surface. By being located high up in the sky, a sensor can view a large enough stretch of the ocean to resolve the large horizontal scales that dominate ocean processes. A sensor measures intensity of electromagnetic radiation from ocean surface as a function of frequency. This information must be translated into an appropriate variable (temperature, height of ocean surface, etc.) that an oceanographer can relate to. The translation is achieved by algorithms whose performance must be checked by comparing sensor-derived values with *in situ* measurements. The performance often differs from area to area. That makes the exercise of comparison, often called 'sea truth validation' all the more important. In this issue Elgar Desa *et al.* (**page 854**) report data on performance of an algorithm that has been used to estimate chlorophyll using the sensor 'SeaWifs' (Sea-viewing Wide field-of-view sensor) that is at present flown on board the US spacecraft 'SeaStar' launched in 1997. The authors examine the applicability of the algorithm in the waters off the west coast of India. Such studies are valuable because they mark a step in the ultimate quest of keeping a tab on biology and fisheries of the waters around India using space-based platforms.

Satish R. Shetye