

In this issue

Declining sperm counts

Sperm counts in men are often considered as an index of male fertility. In recent years there have been several reports that sperm counts have 'steadily declined over the past fifty years'. The inevitable conclusion that this may be due to a variety of chemical pollutants that mimic estrogens has been drawn. Declining sperm counts do not however seem to have had any impact on procreation in much of the world. Are these reports correct? Sadasivan *et al.* address this issue on page 276 using a sample population 'attending an infertility clinic'. Their conclusion is that no decline in sperm count over a 4–5 year period was observed. For good measure, they also note that other semen parameters like volume and sperm mobility were unchanged. Surprisingly, this report is at variance with previous studies published in this journal in the last two years. As the authors note – 'the reasons for this discrepancy are hard to address'. They reach an almost predictable conclusion that such studies must be extended to other regions, include more subjects and be carried out over longer periods of time. One cannot help noting an inescapable parallel between epidemiologists and economists – their data and conclusions do not always seem to correlate with real life experience. After all are we not always told that inflation is declining even as prices of commodities necessary for daily life continue to show an upward trend. An inescapable conclusion maybe that sperm counts (whether they go up, down or remain invariant) may have little to do with 'population figures' that 'show an upward trend, especially in the developing countries'.

P. Balaram

Pakistan's *Ghauri*

Pakistan's launch on 6 April 1998 of a surface-to-surface missile called *Ghauri* has generated much attention and speculation in the world's media both lay and technical. Pakistan has claimed the missile to be 'indigenous'. The article (page 280) by Chandrashekar uses open-source information, detailed technical analysis and credible inference to come to the conclusion that what Pakistan claims to be its indigenous missile is actually the North Korean *Nodong-I* missile. Since the article was readied for publication, information available from quasi-intelligence sources, both from India and abroad, are also consistent with the assessment that North Korea has delivered to Pakistan a number of complete *Nodong-I* missiles and most probably also a complete manufacturing plant for the *Nodong* class of missiles.

Chandrashekar has garnered the information available in any form and systematically checked this for internal consistency. The evidence includes pictures, other published data, the systematic heritage of clandestine procurement activity by Pakistan, and related geopolitical linkages such as simultaneous sanctions by the US on both North Korea and Pakistan for violation of US missile proliferation laws applied by the US extraterritorially on both countries. On this 'geo-technical' evidence, Chandrashekar applies engineering judgement from his experience in ISRO and from expert assessment from within our own scientific organizations concerned with launch vehicles and missile development.

The very nature of the topic addressed constrains any analyst to use only open-source information.

But such information can be erroneous. There therefore remains the possibility that the relevant open-source information is deliberately disseminated to ensure consistency (i.e. disinformation) in the knowledge that analysts would be conducting consistency checks to draw the (intended) wrong conclusion. One must guard against being thus 'led by the nose'. However, in this particular case, the pieces in the jigsaw-puzzle do not fit *so perfectly* as to suggest that the pieces have been deliberately preconfigured for later composition into a clear, bright picture.

Many readers of Chandrashekar's article may raise their eyebrows at the 'non-scholarly' references (as did one of the referees). But given the nature of the available data and that they are scattered and sparse, consistency checks on that evidence (including media reportage) is the only way to validate and establish some confidence in the data. Collaterally, older readers may recall how one of the greats of fluid dynamics, the late G. I. Taylor at Cambridge made an astonishingly close estimate of the explosive power of the first atomic explosion by analysing the time-lapse pictures published first in the newspapers and then in a 'semipopular motion picture record' (Taylor, G. I., The formation of a blast wave by a very intense explosion II, the atomic explosion of 1945, *Proc. Roy. Soc. A.*, 1950, vol. CCI, 175–186).

V. Siddhartha