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EDITORIAL

## The Shanghai Rankings

*Mirror, mirror on the wall  
Who is the fairest of us all?*

—The Queen in *Snow White*

Beauty contests feature prominently in the media and it is fashionable to deride them. Rating beauty is, necessarily, a subjective exercise; most of us would endorse the old saying that 'beauty lies in the eyes of the beholder'. Rankings and ratings enter every sphere of human activity, not only in the election of beauty queens. In many areas like sports, rankings of teams and sportsmen and women are relatively easy to draw up; the parameters on which the ratings are based are generally well accepted. After all, performance is easy to judge and winners and losers are clear to all interested observers. Few would argue against the proposition that Steve Waugh's Australian cricket team was the best in the business, over the last several years, or that Ferrari and Michael Schumacher are the undisputed champions of the Formula-1 racing circuit. There is an element of obviousness in ranking sporting excellence. The Cambridge mathematician G. H. Hardy was fond of ranking his fellow mathematicians. His scale was borrowed from his favourite sport, cricket. The highest grade that a mathematician could receive would be to be placed in the 'Bradman Class'; referring, of course, to Don Bradman universally acknowledged as the greatest-ever batsman in the history of cricket. Hardy's judgements were inevitably subjective, coloured undoubtedly by personal opinions. In science too, 'beauty contests' abound; every selection for an award and every election to an academy becomes an exercise in which individual and collective preferences and prejudices lead to a final judgement. Ranking scientists has become easier as quantitative indicators like journal impact factors and citation counts have become commonplace yardsticks; most judges blissfully unaware of their significance. Almost all quantitative indicators are better applied to institutions rather than individuals; averaging over large numbers of scientists and disciplines may provide a more reasonable index of comparison.

An institutional 'beauty contest', thus appears an interesting exercise. The most recent ranking of universities worldwide has appeared, curiously enough, from a group

at the Shanghai Jiao Tong University (<http://ed.sjtu.edu.cn/ranking.htm>). Nian Cai Liu and his colleagues have used five parameters to rank universities: (i) Nobel laureates on the faculty of physics, chemistry, medicine and economics, (ii) Highly cited researchers (1981–1999) in 21 broad subject categories, (iii) Articles published in *Nature* and *Science* (2000–2002), (iv) Articles in the expanded *Science Citation Index* and *Social Science Citation Index*, (v) Academic performance per faculty, where the indices (i)–(iv) are weighted by the number of faculty. The authors provide a detailed description of their procedure and go so far as to anticipate questions about their protocol (and their intentions) and provide clear answers. For example, they ask: 'Is our academic ranking objective?' Their answer: 'Any ranking is controversial and no ranking is absolutely objective. People should be cautious about any ranking including our Academic Ranking of World Universities. Nevertheless our Academic Ranking is based on internationally comparable data that everyone could check'.

The Shanghai ranking of universities is based on the most stringent research criteria and the range of disciplines covered, presumably, permits a fair comparison of large research universities. The results are unsurprising. The top ten universities are Harvard, Stanford, Caltech, Berkeley, Cambridge, MIT, Princeton, Yale, Oxford and Columbia, in that order. Between 10 and 20 lie seven US universities, along with, Imperial College and University College London and Tokyo University. The University of Toronto at 23 and ETH Zurich at 25 are the other non-US universities in the top 25. The Shanghai group notes that data has been collected on 2000 universities and present a list of the top 500. They also provide convenient lists of the top 100 American Universities, European Universities and Asian/Pacific Universities. The last list covers a broad geographical area beginning with Turkey and Israel in the West, passing through all of Asia and includes Australia and New Zealand.

The Shanghai lists reaffirm the pre-eminence of the American research universities and the English centres of research. Five Japanese institutions, Tokyo, Kyoto, Osaka, Tohoku and Nagoya appear in the top 100. Germany and France do rather poorly with the University of Munich at 48 and the University of Paris-VI at 65, being the highest

ranked. Curiously, the highest ranked institutions listed under China are National Taiwan University (152–200, the range indicating degeneracy) and the Hongkong University of Science and Technology (251–300).

When I pored through these rankings, and admittedly there is something compelling about lists and ranks, my purpose was to find Indian institutions. It took me a while to locate the highest ranked among our institutions, the Indian Institute of Science (IISc), Bangalore, which appears at 251–300. The only other institutes that appear in the top 500 are IIT Delhi and IIT Kharagpur, both weighing in at 451–500. On the Asia/Pacific list IISc comes in at 27–36, while the two IITs are listed at 78–92. The rankings are indeed based on stringent criteria which heavily weigh research performance as judged by high quality publications. It is clear that if more honours, in addition to the Nobel Prize, or more journals, in addition to *Nature* and *Science*, were considered, the list would remain substantially unaltered. If I had been asked to list the top ten research universities in the world, my list would have largely agreed with the Shanghai list. But, as we move further down, ordering on the basis of personal opinion (prejudice ?) becomes more uncertain. There are some notable features of the Shanghai rankings. Six Australian institutions (Australian National University, and the universities at Melbourne, Queensland, Sydney and Monash and New South Wales) appear ahead of IISc. Clearly, Australia has more than sport on its mind. Seoul National University (South Korea) and the University of Auckland (New Zealand) are also marginally ahead.

What then, is the message of the Shanghai lists? It is clear that research output at the best of Indian institutions does not compare well on an international scale, in this analysis. Since the Chinese researchers provide a detailed break-up of the individual scores on their five parameters, I quickly examined the one which appears most widely used – the number of articles in the *SCI* and *Social Science Citation Index*. Even with this criterion, which minimizes the effects of ‘impact, citations and recognition’, it does not appear that the positions will change appreciably. A somewhat distasteful conclusion would be that in measuring research activity over large numbers of faculty in universities, quality and quantity are correlated. The growing tendency to dismiss publication-based analyses of the country’s scientific output as

an inappropriate measure of the health of our scientific institutions must be tempered. The Shanghai study excludes specialized institutions and laboratories, of which we have many. Despite the UGC’s rather liberal award of the term ‘deemed university’ to many of these institutions, most would fail to qualify for the category of a ‘research university’, characterized by activity across a range of disciplines. Sadly, the real universities in India are limping, research consigned to an unimportant role. Even as funding has increased for many of UGC’s ‘five star’ universities, there are evident problems, with faculty disinterested in research clearly outnumbering those with an academic bent of mind. Many Indian universities no longer directly involve themselves in undergraduate education; the process of divestment to constituent colleges is almost complete. University departments must therefore be postgraduate centres of research and scholarship, as indeed they were fifty years ago. Even in the IITs, research is a low priority; the major emphasis is on undergraduate technical education and the major instrument of success is the Joint Entrance Examination (JEE).

I found the Shanghai rankings provocative and disturbing. A widespread analysis of these lists might prove instructive. It is clear (and indeed, it has been so for sometime now) that the academic ambience of our large institutions is decaying. Stemming the rot may be a formidable task. The government which funds these institutions, and the bodies that govern them need to take a long, hard and critical look at the higher education scene in India. A disproportionate amount of effort is spent on self-congratulatory analyses of Indian Institutes of Management and IITs. ‘Brand equity’ is a term that is based on the performance of students produced, it does not reflect the research activity at these institutions. Progress in an increasingly competitive world will depend on a measure of original research activity. The new government, which is still to take office, at the time of this writing, has many complex tasks to consider. The state of higher education and research is one. The Shanghai ‘beauty contest’ has served a purpose. It has provided a dispassionate ranking of universities worldwide. We must now decide whether we should execute the messenger.

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