

## Wallace's line

I wish to remind our teachers of biology in high schools and colleges that 2013 is the death centenary year of Alfred Russell Wallace (8 January 1823–7 November 1913), an eminent philosopher of the natural world. I am not sure whether any major event is being planned in India to remember the life and contributions of this British biologist, who was an ally of Charles Darwin. But I would imagine that biology teachers in high schools and colleges in India could at least spend some time, say 60 min, talking about Wallace and the evolutionary theory he promoted to their respective students in routine biology classes. I am sure such a presentation will trigger curiosity and reflective learning in the young minds. I imagine that, in this manner, we could collectively pay homage to a

great biologist–evolutionist of modern times.

As one interested in plant and animal geographies, I have always been fascinated by the Wallace's Line. In a year after he returned to Britain from his travels and collections of animal specimens in South and Southeast Asia and Australia, Wallace presented a paper on the physical geography of the Malay Archipelago at a meeting of the Royal Geographical Society of London<sup>1</sup>. A map he showed during his presentation included a boundary between the Asian and Australian biological systems, which Thomas Huxley in a paper on the gallinaceous birds published in the *Proceedings of the Zoological Society of London* in 1868, validated as the Wallace's Line. Although Wallace's Line is a highly debated

topic in evolutionary biology, his work needs to be recalled and looked into by students of biology with excitement and disinterestedness.

Biology teachers at different levels might use this opportunity to highlight the work of Alfred Wallace and the intricacies in the interpretation of organic evolution.

1. Wallace, A. R., *J. R. Geogr. Soc.*, 1863, **33**, 217–234.

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## The state system of S&T research in India

Studies on the performance of higher education and research (HE&R) in India normally use the following sector-wise institutional classification: (i) Institutes of national importance (INIs) (IITs, NITs, etc. – about 40). (ii) Research institutes and laboratories (CSIR, DRDO, DBT, etc. laboratories – about 400). (iii) Universities and colleges (Central, State and Private – about 600 universities and 25,000 colleges). (iv) Private R&D entities and others.

(i) and (iii) carry out both teaching and research, whereas (ii) and (iv) are exclusively R&D entities. (i) and (ii) are owned and managed by the Central Government, whereas (iii) has Central Government, State Government and private institutes under it. In terms of the numbers, it is however known that about 90% of the institutes of HE&R come under the State System, either directly as universities and colleges run by the State Governments, or indirectly as private colleges affiliated to the State universities. Information regarding the performance of the State System of HE&R is difficult to come by because most studies submerge it under category (iii) above. This information would however be signi-

ficant for various reasons, including the fact of the enormous differences in resources, funding, support and patronage enjoyed by institutes under the Centre and the State. Thus a logically more useful classification for doing performance studies of research institutes would be the following: (i) Research institutes and laboratories; (ii) Central universities and

institutes; (iii) State universities and affiliated colleges; (iv) Private research institutes.

The first two together can be termed the Central System and the third the State System. The low levels of quality, both in terms of teaching and research, of the State System is widely known and commented upon – this system is in fact

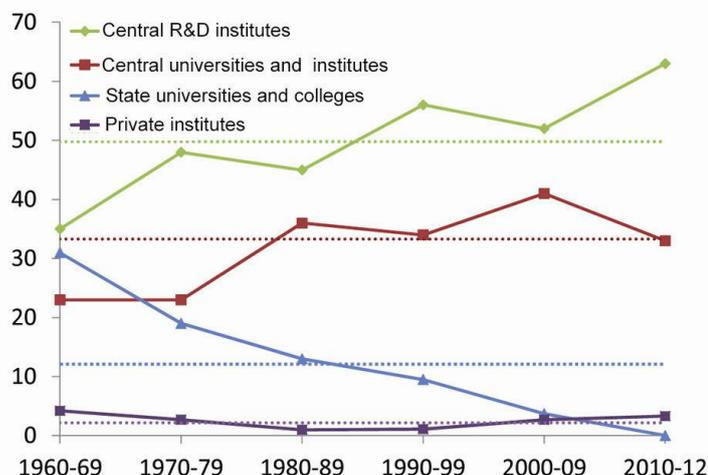


Figure 1. Share (percentage) of Bhatnagar Awards among different classes of institutes: all branches (1960–2012).

viewed as a blot on India's image in this field and it stays on solely due to its enormous size.

As mentioned earlier, not much information is available as to how the State System has been performing in the field of science and technology (S&T) research in our country. An effort was made in this study to get a quantitative perspective of the same in terms of the share of Bhatnagar Awards going into the four sectors mentioned above using data available on the internet at <http://www.csir.res.in/external/heads/career/award/bhatnagar1998.htm> and <http://www.dst.gov.in/awards/award-index.htm>.

The result is shown in Figure 1 that gives the share of Bhatnagar Awards going into the four sectors, taking all the six categories of awards into account, and covering the period 1960–2012. The points on the graph are decadal averages for five decades, with the last point being the average for the last three years (2010–2012). The horizontal line of a particular colour indicates the average for the entire period of the entity shown in that colour, thus giving an average

share of 50% for R&D institutes, 33% for INIs and 13% for State universities. During the decade 1960–69, R&D institutes had 35% share of the Bhatnagar Awards, followed by the State universities at 31%, and Central institutes at 23%, after which the steady decline of the State System sets in, the curve hitting zero in 2007 and staying there since then.

The steady and steep plunging of the curve for the State university system over five decades must be one of the most dramatic presentations of what has been allowed to happen to this segment. (Equally disturbing is the fact revealed in the figure that even central educational institutes appear to be losing out to the R&D institutes which are obviously non-academic in nature – with disturbing portents for the future of India's science.)

It could be mentioned that, representing as it does the highest level of quality in Indian science, Bhatnagar Awards can be expected to go only to the very top institutes. But the disappearance of our state system from the national S&T radar is total and complete elsewhere too, as evidenced from their near-absence in any

of the S&T policy formulation bodies like SAC-PM, influential studies that make recommendations like the National Knowledge Commission, the numerous Committees and Boards that decide on R&D funding, important academies and editorial boards, etc. Why this phenomenon cannot be glossed over as another of the inconvenient truths about our country is the sheer fact of the State System being numerically over 90% of our nation's HE&R system. Many of our bold national visions of the day like doubling our share of the world's publications from its present value of about 3.5%, or raising our GER from the present value of 12–13% to a respectable 25%, etc. are grossly unrealizable without significant improvements in the quality of our State System.

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## Discovery of Manmanhara, the largest flattened plateau of Karnataka and second largest in India

Large flattened lateritic plateaus are rare in the Western Ghats although small ones, less than 2 sq. km do occur, but are left highly neglected due to their seasonal adversities. The Kaas Plateau (10 sq. km) of the north Western Ghats in Maharashtra is the largest flattened lateritic plateau of India. During extensive surveys for the collection of curious, endemic and botanically interesting plant wealth, specific to lateritic plateaus in Mookambika Wildlife Sanctuary, Udipi district, Karnataka (13°42'–13°59'N lat. and 74°39'–74°50'E long.), the present authors found few such small plateaus within the sanctuary which inspired to explore the possibility of larger one. The endeavour resulted in locating a completely concealed, evenly flattened hilltop which formed a large lateritic plateau, the Manmanhara Plateau (Figure 1). Endowed with dense, extremely diverse array of flowers, variously coloured and in full bloom, spreading like a

carpet from one end to the other on the land, the entire panorama radiated like a botanical paradise, left undiscovered even during the extensive explorations of British botanists since 1807 (ref. 1) and unexplored till date.

The Manmanhara Plateau is located in the southwest boundary of Karnataka, 10 km from Kollur town, Udipi district, at about 700 m altitude, 13°48'N lat. and 74°44'E long. The name Manmanhara was given by the local inhabitants of the adjacent Meghani valley perhaps owing to its mesmerizing natural beauty during rainy season. Stretching about 6 sq. km, the broad, flattened, more or less circular plateau is the second largest in India after the Kaas Plateau and largest in Karnataka. The entire plateau is surrounded with moist deciduous and semi-evergreen forests. It harbours about 300 diverse species of angiosperms comprising many exclusive, endemic, endangered and botanically curious plant species,

and is also repository of the type locality of the rare *Canscora devendrae* R. Kr. Singh & Diwakar<sup>2</sup>, *Ceropegia attenuata* Hook. var. *mookambikae* Diwakar & R. Kr. Singh<sup>3</sup> and *Curcuma mukhranae* R. Kr. Singh & A. Garg (R. Kr. Singh and A. Garg, unpublished). Further, 20% of the 300 angiosperm species which are endemic to the plateaus of the Western Ghats, also occur on this flattened plateau, viz. *Aerides crispa*, *A. maculosa*, *Alysicarpus pubescens*, *Chlorophytum glaucum*, *Crotalaria nana*, *Dendrobium barbatulum*, *D. microbulbon*, *Dimeria deccanensis*, *D. stapfiana*, *Eria dalzellii*, *E. reticosa*, *Eriocaulon cuspidatum*, *E. dalzellii*, *E. eurypeplon*, *E. odoratum*, *Euphorbia fusiformis*, *Fimbristylis lawiana*, *Flemingia tuberosa*, *Geissaspis tenella*, *Glyphochloa acuminata*, *Habenaria crinifera*, *H. digitata*, *H. grandifloriformis*, *H. heyneana*, *H. plantaginea*, *Impatiens kleiniformis*, *I. minor*, *Indigofera dalzellii*, *Indopoa paupercula*, *Iph-*