Table 1. Comparison of top languages using bibliometric indicators

Language	Papers 1945–2014	Papers 2005	Papers 2014	Papers (*P*) (2005–2014)	Citations (*C*) (2005–2015)	Average citation *C*/*P*	*h*-index
German	968,450	8420	7030	88,107	166,230	1.89	51
French	691,264	6248	4361	63,684	110,800	1.74	41
Russian	685,860	2417	1124	19,624	12,028	0.61	13
Spanish	206,062	2937	6171	61,301	113,679	1.85	44
Chinese	136,956	6702	5850	70,240	201,028	2.86	52
Japanese	129,220	1797	1164	15,466	18,929	1.22	20
Portuguese	73,009	1567	4246	49,551	132,329	2.67	50

also been an increase in the number of Spanish and Portuguese papers. Japanese and Russian language papers have maintained a nearly constant rate of publication. However, there is a gradual decline in the number of papers published in all these languages since 2009.

With increasing preference for English, it is unlikely that the output of non-English research papers may increase in future. According to Gordin[2], 'It is not that one language is more scientific than others but this decline of non-English languages and the rise of English is due to complex historical factors.'

1. https://en.wikipedia.org/w/index.php?title=English_language&oldid=700675769 (accessed on 22 January 2016).
2. Gordin, M. D., *Scientific Babel*, The University of Chicago Press, Chicago, 2015.

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Plate tectonics at the blink of an eye

Tectonic processes on the Earth operate over a scale of millions of years. Today, we only see their cumulative outcome in terms of topographic build-up, evolution of landscape, emergence of island belts, reorganization of tectonic plates, etc. These processes cause crustal deformation through distinct phases of the earthquake cycle. An earthquake cycle operates over tens to hundreds of years. The process of strain accumulation in an earthquake cycle is slow, varying from less than a couple of millimetre per year in the plate interior (e.g. Indian peninsula) regions to less than a couple of centimetre per year in the plate boundary (e.g., Himalayan arc) regions. We do not notice these changes until we use high-precision measurements, e.g. space-based global positioning system or interferometry synthetic aperture radar measurements. However, occurrence of an earthquake, the most prominent phase of an earthquake cycle, in which accumulated strain is released in a few seconds to minutes, makes us realize that the strain which just got released during the earthquake, must have accumulated in the preceding years, which could range from a few tens to hundreds or even thousands of years. Thus an earthquake is testimony to a process which operates over several decades to centuries. In other words, the process of earthquake occurrence actually provides a big window through which we can observe how plate tectonics operates on Earth. Such windows may be few and far separated in time and space, and therefore difficult to experience during one's lifetime. We know that the Indian plate that got detached from the African continent about 95 million years ago, had embarked on its northward journey until it collided with the Eurasian plate, ~40 million years ago, giving rise to the Himalaya. The entire process must have largely been accomplished through the occurrence of several hundreds or thousands of great earthquakes. The direct evidence for all of these has obviously been modified by the subsequent geological processes, but the underlying mechanism is plate tectonics.

What we see today are the two continents, Africa and India, separated by an ocean; we can only infer its past. However, we are currently witnessing a similar process which is underway in the Indian Ocean. The plate motion and earthquake occurrence in the region suggest that the notion of traditionally considered Indo-Australian plate being single and rigid is wrong and the plate boundaries between the India and Australia plates in the region are found to split the Indo-Australian plate, hitherto considered single, into India, Australia, and Capricorn plates. The region of the diffused plate boundaries extends from the central Indian ridge near Chagos bank, eastward past the 90°E ridge to the Sumatra trench, southward along the 90°E ridge, and southeastward throughout the Wharton basin, covering an area of about 6 million km^2. The southwestern part of the plate appears to have already fragmented to produce the Capricorn plate which has a diffuse boundary with the Australian plate along the southern 90°E ridge. Although the process of plate breaking and fracturing in this region is slow, in a span of less than two decades, it witnessed two great and two major earthquakes on 18 June 2000 (*Mw* 7.8), 11 April 2012 (*Mw* 8.6 and 8.2), and the recent earthquake on 2 March 2016 (*Mw* 7.8). Because of the largely horizontal motion on the fault planes during these earthquakes, causing no or small vertical displacement of the sea floor, fortunately none of these earthquakes caused any significant tsunami. The earthquakes in the diffused plate boundaries are found to break the plates through their complex ruptures, like a weak but highly stretched trampoline being shattered by a jumping gymnast. On a shorter timescale, these individual earthquakes represent the process of strain release which accumulated over several hundreds of years, but on longer timescale they represent the process of plate tectonics which operates over millions of years.

Such snapshots from the evolution of a plate bundary are rare, as we are usually exposed to the cumulative outcome of such processes that operated in the past. Thus, what happens in the central ocean is akin to the blink of an eye, a brief history in the development and growth of plate margins.

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The exclusion zone of Narora Atomic Power Station – a control hothouse

A nation's development and prosperity goes hand in hand with its capacity to generate renewable sources of energy through power generation, which is crucial to balance the depleting natural resources. However, regions with Nuclear Atomic Power Station (NAPS) are often perceived to be infiltrated with toxic emissions percolating in their water reservoirs and atmosphere, which may be detrimental for all life forms in the vicinity. A botanical trip was conducted to NAPS at Narora (Figure 1) while carrying out survey and plant collection of the Upper Ganga Ramsar Site in Uttar Pradesh, India. This riverine Ramsar Site extends along 85 km stretch of the River Ganga beginning at Brij Ghat in Ghaziabad district and ending at Narora in Bulandshahr district, passing through the Budaun and Moradabad districts.

Figure 1. The NAPS at Narora towers with peripheral exclusion zone. A pair of Indian skimmers can be seen in the foreground.

The NAPS is located at 28°09′N and 78°24′E, and at 169 m in Narora village block within the tropical climatic belt. During atomic power-generation process, the superfluous radiations are passed through high-efficiency filters (HEPA) for removing obnoxious contents inside the premises itself and then through 143 m high stack which dilutes the remaining traces of radioactive particles after HEPA filters. The filtered gases are finally released and dispersed in the atmosphere. The core zone of the atomic power plant is further encircled by a green-belt exclusion zone of 1.6 km radius, with exceptionally dense tree canopy, which is helpful in augmentation of the atmospheric oxygen content and hence functions as 'control enclosure' with its rich flora and fauna.

Figure 2. Bird congregation in NAPS precincts.