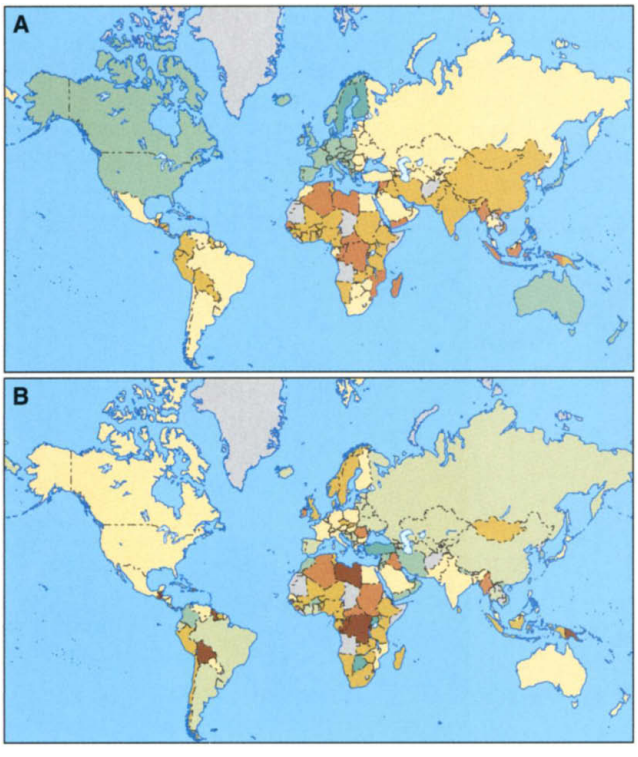
Worldwide Scientific Publishing Activity

IF WE VIEW SCIENTIFIC ACTIVITY AS AN indicator of wealth, and if we believe that publishing activity in peer-reviewed journals is correlated to scientific activity, then we can take the amount of papers published by individuals of a nation (divided by its total population) as an indicator of that nation's wealth. In the case of scientific activity, there is the expectation that it not only reflects today's wealth, but also promises future wealth through the practical application of the scientific knowledge generated.

We analyzed this indicator using the MEDLINE database of biomedical journal articles (*1*), which contains entries including the main address of the authors and the date of the publication. A first static analysis (measuring the papers published per inhabitant during 1996–2001) offered no surprises (see panel A of figure). The differences between First, Second, and Third Worlds are easily seen in a 10-fold difference in the amount of articles published per inhabitant.



We analyzed over 4.2 million entries from MEDLINE corresponding to articles published during 1989–2001. We identified the countries in the authors' affiliations for 4.0 million entries. Countries that became independent after the dissolution of former countries during the period analyzed were counted as one country (namely, the Union of Soviet Socialist Republics, and the former federal republics of Yugoslavia and Czechoslovakia). The population of each country as of May 2002 was taken from (*4*). (A) Approximate amount of publications for the years 1996–2001 per million inhabitants by country: dark green, 10,000; light green, 1000; yellow, 100; light brown, 10; dark brown, 1. (B) Ratio of the number of publications for 1996–2001 to the number of publications for 1989–95: green tones, positive trend; yellow, stable trend; brown tones, negative trend. Gray indicates that no publication corresponding to that country was found.

Being aware that developed countries dominate the process of publication and that this might bias the analysis (*2*), and in order to show the evolution of scientific activity in different areas of the world, we analyzed the relative evolution of publication activity in two periods, a parameter that should be independent of the dominance of developed countries in publishing. This comparison yields a disturbing result (see panel B of the figure): Most countries with low levels of publication (brown in panel A) also suffer from a negative publication trend (brown in panel B). This means that, unfortunately, the gap between scientifically active countries and the rest is apparently widening rather than closing.

Scientific funding agencies worldwide should take this into account. As claimed repeatedly (*3*), projects that train scientists from developing countries and help create research groups in those countries must be promoted, because we feel that scientific development will bring these countries socioeconomic development and because the global scientific community cannot afford to waste the intellectual capacity of developing countries.

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Collecting Biological Materials

I READ RICHARD STONE'S PROFILE OF biologist Gary Strobel ("Biologist gets under the skin of plants—and peers," News Focus, 31 May, p. 1597) with great interest. I would like to know if Strobel abides by local regulations about collection and exportation of biological materials in the many countries where he has worked. I deeply hope that Strobel does not see Third World countries merely as raw materials providers for technological developments, for which our people must later pay high royalties. The use of Third World (and all) natural resources should result in mutual and equitable benefits. And, as Strobel may understand, this is much more than simply returning a portion of the profits to the local communities. Third World countries are under tremendous pressure to comply with patents and royalties from developed countries (and many times these patents are derived from Third World resources); scientists all around the world should be encouraged to comply with each country's regulations about the collection and exportation of biological materials.

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