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### SCIENTIFIC PUBLISHING IN PERIPHERAL (a.k.a. developing) COUNTRIES: CHALLENGES FOR THE FUTURE

*"It is science alone that can solve the problems of hunger, poverty, insanitation and illiteracy. The future belongs to science and those who make friends with science"*

Jawaharla Nehru, free India's First Prime Minister  
(Allahabad University, 1946)

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#### ABSTRACT

In this paper, I first refer to the center-periphery dichotomy in terms of scientific output, placing emphasis upon the relation that exists between science and technology development, on the one hand, and social and economic development, on the other. I then analyze the main problems faced by most peripheral journals and the role national states play in scientific activities in developing countries. I then address issues such as the world power structures, the social organization of peripheral countries, growing North/South disparities and the question of collaborative research. The discursive (i.e., language related) and non-discursive problems faced by peripheral researchers and the main initiatives that have recently been taken to try to solve the stark disparities that exist in the world of scholarly publishing are also discussed. I finally present a proposal, the aim of which is to suggest ways that could help peripheral scientists become fully integrated members of the worldwide network of science and would also contribute to the promotion of scientific multilingualism, a means for science to be truly universal, as it should be. I conclude by arguing that science, technology and publication form a triad which is essential for the survival of developing nations, and that, although the complete elimination of inequities in the world of scholarship is unlikely, progress could be achieved if there were a **universal** will (i.e., a worldwide will at the institutional, governmental and intergovernmental levels) to redress the current North/South imbalance.

**Keywords:** linguistic imperialism, scientific multilingualism, periphery, NNES scientists, research, local/small journals.

When talking about scientific research and publishing, one must refer to a number of different concepts, including: 1) science itself, 2) publishers, 3) the role of national states, 4) the world power structures, and 5) the researchers themselves.

In this paper, I wish to draw attention to the stark disparities and inequities that exist in the world of scholarly publishing and also to the fact that the gulf between rich (developed or center) countries and poor (developing or peripheral) countries is widening.<sup>1</sup> Indeed, the digital divide contributes not only to the exacerbation of this gap but also to the deprivation suffered by researchers in developing countries. I therefore first of all examine the broad geopolitical context of academic/scientific publishing (numbers 1 to 4 above), and then the more specific problems faced by peripheral researchers, i.e., scientists who live in developing countries whom Canagarajah (1996: 468) refers to as “consumers of central scholars’ knowledge”, and Ferguson (2007) as those off-networked academics who are scholarly isolated from the conversation of the discipline. I then discuss the main initiatives that have been undertaken lately to try to redress the current world imbalance regarding the world’s scientific output, and I present a proposal, the aim of which is to promote scientific multilingualism by suggesting ways that could help peripheral scientists become fully integrated members of the worldwide network of science.

## **1. SCIENCE: Center-periphery dichotomy**

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<sup>1</sup> What used to be called the “Third World” is now most frequently referred to as the ‘developing’, ‘peripheral’, ‘marginal’, ‘non-center’ or ‘outskirt’ world in opposition to the ‘industrialized’, ‘center’ or ‘developed’ world. In this paper, I will refer to the former as the ‘peripheral’ or ‘developing’ world and to the latter as the ‘center’ or ‘industrialized’ one. It should be kept in mind, however, that, within the developing world, further distinctions are today made between ‘least developed’ countries (LDC) or the ‘Fourth World’ (e.g., Niger) and ‘newly industrialized’ countries (NIC), such as India, Iran and China. Some economists even talk about a “Fifth world”.

A small but important part of the world inequities manifests itself in the field of scientific publishing where the bulk of what is published in widely read peer-reviewed scientific journals is authored by writers associated with institutions in industrialized countries.

The scientific world, divided into the haves (the industrialized world) and the have-nots (the developing world) is remarkably unequal in terms of volume and output. By way of example, the scientific output of some of the leading developing countries (e.g., India) is less than that of a single university department in scientifically advanced countries.<sup>2</sup> But the peripheral world is not a homogeneous whole; indeed, even within developing countries (and regions) there is a tremendous disparity in the distribution of science.

Moreover, the gap between the haves and the have-nots is not only dramatically evident but also constantly widening (e.g., Marusic and Marusic 2000, Arunachalam 2002). In 2001, the United States of America, the European Union (then made up of 15 members only), and Japan, some of the world's wealthiest countries, collectively accounted for 78.3% of the world's published scientific research (European Commission 2003). Taking citation analysis as an indicator of the global strength of science, King (2004) shows that 31 nations only (out of a total of 191) contribute 98% of the volume of citations to scientific research. In 2003 (when King collected his data), the USA ranked first, the UK came second, but the European Union was overall second. Then followed Germany, Japan, Canada, France and Italy. The rest of the world, and this was King's key point, came as a very poor third. Of these 31 nations, only 3 belong to the peripheral world (China, India and Iran).

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<sup>2</sup> According to Arunachalam (2002: 7), in 1998, Malaysia, Philippines, Thailand, Indonesia, Pakistan, Sri Lanka, Bangladesh, Peru, Cuba, Venezuela and virtually every country in Africa (except South Africa) had published less than 1,000 papers each; in many cases, less than 500). The same source indicates that if we look at the number of papers published per unit population, the gap between the developed and the developing countries is even more striking. One should however be careful with such assertions: the Science Citation Index (from which most scientometric/bibliometric data are drawn) indeed covers less than 1/4<sup>th</sup> of peer-reviewed journals worldwide and its preference for English-written journals is well-known (Cronin 1984, Dong et al 2005, among many others). A review of the latest Citation Index, for example, cites less than 2% of the journals published in the developing world (ISI citation index, <http://www.isinet.com>, accessed October 2006).

The existing disparity is also highlighted by the fact that 90% of important scientific research is published in 10% of journals, and while developing countries comprise 80% of the world's population, only 2% of indexed scientific publications come from these parts of the world (Abdelrahim 2004). In a nutshell, then, all the macro bibliometric and scientometric studies, recent and past (e.g., European Commission 2003, King 2004, World Bank 2006), bear out that there is a strong association between research output and national wealth distribution across the world.

Understanding the reasons for the dearth of scientific productivity from developing countries is not only of academic interest, but essential for promoting the economic and social development of these marginal regions of the world for which the "culture of science" must be one of their prime objectives if they want to have a chance to overcome hunger, poverty, insanitation and illiteracy and stop being the victims of exploitation (see Nehru's quote at the beginning of this paper). Indeed, the strong correlation between science and technology development, on the one hand, and economic development, on the other, is very well documented (e.g., King 2004, Man et al. 2004). Furthermore, science, technology, industrial development and power (political, military and economic) form a circle whose individual components stimulate the others.

The problem is that, while the role of technology is quite well understood by the governments of peripheral countries, the importance of basic research is not. Indeed, research and editorial practice are not a tradition in the great majority of developing countries (except for a few, like India, China and Iran). Science and technology are, at best, marginal activities whose requirements in infrastructure (well-stocked libraries, laboratories and specialized equipment, complex logistical support, etc), human resources and substantial financial resources are, as I argue below, far beyond the reach of developing countries. As Ferguson (2007: 21) puts it: "The production of high-quality scientific research is quite evidently an expensive business." In other words, as the above figures indicate and as the macro bibliometric statistics have repeatedly shown, there is no research culture/tradition in most developing nations.

## 2. PERIPHERAL PUBLISHING

In an ever increasingly competitive and interdependent world, editorial houses dedicated to the dissemination of scientific knowledge aim at reaching the widest audience possible and at making the maximum profit possible. In order to reach these objectives, and because publications are the lifeblood of science, the scientific quality of the journals they publish is of paramount importance. This can only be reached through a rigorous assessment of the scientific quality of the papers published, assessment that must be performed by highly competent and reliable extramural referees.

Small/local/peripheral journals face a number of problems: To start with, the quality of the papers they publish is in general quite low. Obviously, then, these journals' impact factor (the so-called “currency of science”)<sup>3</sup> and citation frequency are extremely low. Furthermore, being written in local (i.e., not widely read) languages, they are seldom seen or commented on in the mainstream publishing community (cf. Pakir 2005 regarding Asian scholarship, Habibzadeh 2006 for Middle Eastern scientific publications, and WHO-EMRO 2003 for the Arab World in general). They are thus invisible and fall into the lost science domain, the actors of which are denied academic promotion (e.g., Marusic and Marusic 1999, Phillipson 2001, del Castillo 2004, Tardy 2004, Pabón Escobar and da Costa 2006). Another problem of local journals is that their readership is very small: it hardly ever transcends national boundaries and are, as a rule, only read by those who publish in them. Full-fledged periphery scholars indeed not only rarely publish in them (they prefer to send their best works to mainstream journals written in English), but they also hardly ever consult them because they are aware of their many editorial and technical flaws (Canagarajah 2002, Duszak 2006, Pabón Escobar and da Costa 2006).

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<sup>3</sup> The impact factor is now a widely accepted criterion to assess the quality of scientific journals. (cf. Dong et al. 2005). But it has been recently debated and criticized. Egbert (2007), for example, warns against the use of the impact factor as the sole indicator to determine the value of a given journal. Sharon Begley (2006), for her part, denounces the fact that a standard procedure of some leading journals is to send an email to all submitting authors, asking them to include citations from these journals to boost their impact factor! The executive director of the American Physiological Society, which publishes 14 journals, put it even more bluntly by asserting that “*We have become the whores of the impact factor*” (cited in Begley 2006).

These problems are further compounded by the fact that financial restrictions affect their publication and distribution. Small journals therefore generally lack continuity and suffer from “*an unavoidable irregularity*” in the frequency of their appearance (Katic and Penava 2005). They also publish few advertisements and are therefore strapped financially (Morcos 1999). This makes it difficult to keep up with changing technology. All this means that periphery journals cannot be competitive in the continuously more open scientific “market”. For all these reasons, local journals’ chance of survival is minimum because visibility is a necessary condition for survival. They in fact truly perish year after year (cf. Duszak 2006, Pabón Escobar and da Costa 2006).

### **3. THE ROLE OF NATIONAL STATES**

The role of the State in scientific activity varies according to the countries’ level of industrialization and development. In highly developed nations, about 30% of research is publicly funded. The remaining 70% comes from the private sector. By contrast, in periphery countries, the bulk of the funds for research, often more than 75%, comes from the public and university sectors with very small contributions from the private sector (e.g., Nour 2005).

According to a recent study conducted in the five highest ranked general medical journals (Man et al. 2004), developed countries devote between 2% (USA, the UK, France) and almost 4% (Sweden, Finland, Japan) of their GDP (Gross Domestic Product) to scientific activities. This is between 4 and 7 times as much as what developing countries dedicate to such activities: on average, they assign less than 0.5% of their GDP to research and development. Since the GDP of center nations is much higher than that of developing nations, the investment in scientific research in highly industrialized nations is incomparably greater than that of developing countries.

The current scientific world imbalance is thus not difficult to understand. Apart from the figures presented in the preceding paragraphs, it is worth noting the results of Man et al’s study (2004) which showed, on the one hand, that research spending (percentage of GDP) and English proficiency (assessed by means of national scientists’ TESOL scores) are

strongly associated with publication output, and, on the other, that national scientists' proficiency is an even stronger correlate of publication output than funding.

#### **4. THE WORLD POWER STRUCTURES**

Industrialized countries, in spite of all their eloquent political speeches and promises, are much more willing to provide economic aid to fight against famines in Africa and drug-trafficking in Latin America, to open roads that give access to the sea (in order to "strengthen representative democracies" or "to protect the environment") than to effectively promote authentic scientific research in developing countries or contribute to their technological development. Indeed, industrialized countries prefer to keep their precious "know how" than to teach it to developing countries. At the Global Research Village Conference held in Denmark in 1996, Mr. Rudolph Scholten, Austrian Minister of Research, Science and Arts avowed that:

Developed countries are less interested in giving than in selling to developing countries... There is a big gap between what developed countries profess and what they are actually doing in matter of development (cited in Arunachalam (2002: 3).

Four years later, in 2000, the Amsterdam Global Research Conference emphasized the need for Northern countries to give priority to building a research culture and adequate research capacities in the developing world. Unfortunately, the transfer of basic knowledge and the development of opportunities for knowledge generation in developing countries continue to remain neglected. The rhetoric of such conferences (and that of many others, I am afraid) is hardly ever put into action. Moreover, the social organization of peripheral countries largely accounts for the ineffectiveness of research efforts in these regions of the world. It is indeed characterized by small dominant elites, strong central governments, oppressive bureaucracies, weak economies, high inflation rates, fragile institutions, and unstable political systems.

The world scientific inequities offer a further advantage for the powerful world: it permits brain migration from the poor to the rich countries. The Arab states, for example,

have produced a number of outstanding Nobel Prize winners in recent years, but all these scientists have moved to either Britain or the USA (King 2004). Regarding the African continent, the latest figures indicate that it is losing net 100.000 scientists in science, technology, medicine and nursing to the North every year (King 2004). This is a net loss for Africa, a very negative capacity building, indeed. Along the same lines, Mullan (2005) reports that the brain drain from developing countries produces over a quarter of the medical workforce in the UK, Australia, Canada and the US.

Unfortunately, with very few exceptions, the gulf between rich and poor countries is widening and the digital divide contributes to its exacerbation (Lown and Banerjee 2006). Let us examine three examples of such widening disparities:

1. For the years 1994-96, there was an average of 300 scientists and engineers (full time equivalent) per million inhabitants in the South, against an average of 3.300 in the industrialized countries (United States Development Program 1997). By way of example, a single firm like General Motors invests far more on research than the entire Research and Development budget of India, a leading science performer in the developing world (Arunachalam 2002). But we should bear in mind that these are mere numbers that do not take into account the quality of the training and the resources at the scientists' disposal.

2. Of the \$70 billion dollars spent annually on medical research worldwide, only 10% is allocated to poor countries that bear 90% of the world's disease burden. This has been called the 10/90 divide (Horton 2003 and <http://www.globalforumhealth.org/>):

3. In his editorial entitled "*The great medicines scandal*" published in 2006 in the *British Medical Journal*, Richards openly condemns the fact that only 21 of the 1556 new chemical entities marketed between 1975 and 2004 were targeted at "neglected tropical diseases", and that only 10 of these 21 drugs were aimed at malaria and tuberculosis, by far the major diseases that affect the Third World, especially Africa and parts of Asia. Of course, the millions affected by these diseases (as well as those who



suffer from "Western diseases" in the Third World) can ill afford proper treatment because of the prohibitively high drug prices for patients (3 to 100 times the international reference price).

As far as collaborative research is concerned, here too, the situation is unsurprisingly unequal. Several studies (Zaki 1993, Raina and Irfan 1994, Kachru 1996, Lee and Mills 2000, Mendieta et al. 2006, among others) indeed denounce the inappropriateness of governance of collaborative research, i.e., the fact that funding bodies from the first world tend to favor commissioning research themselves rather than supporting research initiated by peripheral investigators. Along the same lines, the *Science and Engineering Indicators 1998* of the US National Science Foundation revealed that the number of internationally co-authored papers worldwide increased by 200% between 1981 and 1995, but most of this collaboration takes place among the OECD countries, especially the G8 countries.

The CNRS-LEPI data (1991) similarly show that both in 1981 and 1986, OECD countries accounted for more than 81% of internationally co-authored articles. Very few papers indeed resulted from international collaboration involving African or Latin American countries (Arunachalam 2000). It is interesting to note that Braine's study (2005b) about Hong Kong applied linguistics publishing corroborates these findings. This situation is therefore not the "privilege" of the hard sciences. Thus, not only is science dominated by the few industrialized countries (King 2004), but scientific collaboration is dominated by them as well.

## **5. NNES RESEARCHERS**

Davies (2003), Swales (2004), Ferguson (2005, 2007) and Hwee (2006) argue that the native/non native dichotomy has become quite problematical, and its utility, relevance and coherence are currently being questioned. The argument is that the degree of experience/expertise in academic publication and proficiency in certain genres of academic discourse (i.e., the novice vs. expert dichotomy) are more important than the

NES/NNES status (cf. Hyland 2000, 2006). However, for want of a better short expression, I will here use the NES/NNES one.

### **5. 1. The discursive (language-related) perspective**

A caveat is in order here: Just as marginal countries do not form a homogeneous group, as I said before, NNES do not either. There are NNES in the center as well as in the periphery. And if we want to be even more exact, a further distinction should be made on the one hand, between those “privileged” NNES who have spent time in an English-speaking country (the “*exiled from paradise*”, in Geertz’ parlance, 1973) and/or those who are members of prestigious, international known research groups and/or laboratories in their home country, and, on the other, those who never left their home country and/or do not have the chance to conduct research under the supervision and mentoring of renowned NNES scholars or NES expatriates. For the former, obviously, writing up a scientific/academic paper in English will be less difficult and less time-consuming than for the latter who cannot rely on their peers’ expertise and L2 linguistic assistance.

As far as scientific communication is concerned, the disadvantage of being an (English) additional language user may be on the wane, as scholars such as Swales (2004), Flowerdew (2000), Canagarajah (2006) and Ferguson (2005, 2007), among others, have recently pointed out. One’s status as a NES or as a NNES may thus be becoming a less critical determinant of success in academic/scientific publication than other non-linguistic factors, such as location (center vs. periphery), level of expertise (junior vs. senior researchers), network access, etc.

This is undeniable. However, the importance of linguistic skills should not be underestimated (cf. Coates et al. 2002, Man et al. 2004, Hewings 2006, Langdon-Neuner 2006, Benfield and Feak 2006). Ferguson (2007) himself asserts that for some multilingual scholars, linguistic factors do constitute an additional obstacle to negotiate on the path to academic publication (e.g. the NNES scholars I referred to above who never left their home country). The problem is, firstly, that non-discursive factors very frequently go hand in hand with poor linguistic skills (at least in non-English speaking

peripheral countries) and, secondly, that poor linguistic skills frequently go hand in hand with paper rejection. Coates et al. (2002), for instance, clearly show that badly written articles correlate with a high rejection rate and that, although many factors could influence the rejection of an article, on equal scientific merit, a poorly written article will have less chance of being accepted. This represents a vicious circle that leads us to the following so frequently asked question: Are NNES scientists discriminated against?

Quite a few recent studies from a variety of disciplines provide clear evidence of bias favoring authors from the USA, English-speaking countries outside the United States, and prestigious academic institutions (Canagarajah 1996, Link 1998, Garfunkel et al. 1994, Gibbs 1995, Altbach 1997, Wood 1997, Swales 1998, Flowerdew 2000, Coates et al 2002, García Landa 2006, inter alii), the most recent ones in our field being Braine's report (2005a) and Li's sociopolitical case study (2006). By contrast, John Flowerdew's research (2001) in ELT and applied linguistics suggests that there is no evidence of discrimination against non-native English submissions, but his Cantonese-speaking informant in mass communication (Flowerdew 2000: 135) certainly holds the view that discrimination exists.

Such divergent findings could be attributed to different disciplinary contexts, to the inherent competitiveness of the field, to the size of the discourse communities, to whether the NNES authors are from the center or the periphery, etc. The fact remains that empirical evidence for discrimination or non-discrimination claims is mixed and rather inconclusive (Ferguson 2005, 2007), and that there is a widespread, though not universal, sense that NNES scientists are disadvantaged when it comes to publishing their works in mainstream journals that overwhelmingly publish in English and whose gate-keeping practices boost the dominance of Anglo-American discursive norms, styles and conceptions, to the disadvantage of peripheral scholars, in particular. It should be pointed out, though, that the feeling of "disadvantageness" is expressed differently by center NNES. The surveys conducted in the European Union by Ammon (2001b), Murray and Dingwall (2001) and Truchot (2001), for example, clearly indicate that the Swiss and German scholars do not feel that the dominance of English represents a disadvantage to

their careers, whereas -- as could be expected for political and historical reasons-- the French do! (See also Ferguson 2007).

Be that as it may, this state of affair contributes to "*linguistic imperialism*", a phenomenon that has been harshly criticized and condemned (e.g., Phillipson 1992, 2003, Pennycook 1998, De Swaan 2001), although so far, as Jenkins remarks (2006), no noticeable change has occurred in ELT or teacher education policy.

For peripheral authors far from elite academic institutions, the disincentives, disadvantages and obstacles to publication in pedigreed journals are indeed multifarious. Let us examine just a few of them:

- a) lack of academic L1 (and obviously L2) scientific writing policies at the undergraduate and/or graduate level.
- b) universities' lack of budget for specialized editorial staff.
- c) lack of expert help from authors' editors, ghostwriting services, professional writers and/or professional translators to edit their research papers. It is far too expensive.

It thus takes much more time and is much more expensive to learn how to read, write and/or speak English to a high level in the periphery than in the center (Benfield and Howard 2000, Vasconcelos 2006, Ferguson 2007). But, as we all know, more than writing skills are required to publish internationally.

## **5. 2. The non-discursive (not-language related) perspective**

In 1996, Canagarajah mentioned a series of "*non discursive requirements*" many peripheral scientists could not possibly satisfy, such as poor paper quality, unreliable mailing services, under-resourced, absence or unreliability of communication means, etc. For example, there are more phone lines in Manhattan than in the whole of Sub-Saharan Africa, and in 1997, Internet host penetration rates in North America were 267 times greater than rates in Africa. By October 2000, the gap had grown to a multiple of 540 (National Science Board, Science and Engineering Indicators 2002). This explains why, ten years later, new paper electronic submission requirements imposed by leading

scientific journals make it even more difficult for periphery academics to contribute their share to international science. It is indeed in the nature of new technology to exacerbate the divide between the rich and the poor. In short, most of the dilemmas faced by peripheral scholars can be summed up in three words, as Roman Tetil, a professional translator from Kraków, cogently put it:

ENGLISH or €NG£I\$H?

## 6. RECENT INITIATIVES

Is it then at all possible for the developing countries to get integrated into the "Global (rich man's and rich kids') Research Village" or is it an illusion, a utopia? Let us be realistic. Full integration is at best a long way off if it can ever happen, but this does not mean that we should abandon all hopes and refrain from doing something about the situation I have described above. It could be argued that without utopia, there would be no history, and that, without utopia, we would still be living in the Stone Age! In fact, a few initiatives have been taken lately to try to redress the current world imbalance in matters of scientific publication. It is to these that I now turn briefly:

First, scientific writing courses in English have recently been implemented in several regions of the developing World: for example, in India (Basrur 2006), China (Cargill 2007), Iran (Habibzadeh 2006), Croatia (Marusic and Marusic 2000), Brazil (Vasconcelos 2006), Iran (Handjani 2007) and Venezuela (Salager-Meyer 2007).

Second, a few scientific journal editors, reviewers, and/or applied linguists are currently asking for a greater tolerance towards deviation from native standards (Benfield and Howard 2000), i.e., for the NNEs right to "*linguistic peculiarities*" (Ammon 2001a). In this respect, Dr. J.R. Benfield (President of the European Association of Thoracic Surgeons) goes a step further and argues that since it is a privilege for NNEs that the language of science is currently English, and because with privilege comes responsibility, each journal should consider developing a mentoring service wherein NNEs are made

available to non-native speakers when they ask for editorial assistance (Benfield and Howard 2000: 648), an idea also recently put forward by Braine (2005a) regarding *TESOL Quarterly*. Benfield and Feak (2006) also argue that the review of EIL (English as an International Language) manuscripts by a qualified language professional should precede review by a qualified peer. This leads us to the concept of "solidarity and cooperation" a few examples of which I will now present:

1. Ana Marusic, editor of the *Croatian Medical Journal*, a journal published in US English only, suggests that journal editors should function as educators, a move that would empower would-be contributors, through specific training, to become qualified producers of research articles written in English (see also Marusic and Marusic 2000, 2001).
2. An *AuthorsAid* program has been set up, providing developmental editing assistance for inexperienced and "would be" authors, principally from developing countries, who want to publish their health-related research in widely read (English-written) journals. Development editing is the process of turning preliminary findings or ideas into publishable manuscripts. Those who advertise this program contend that, for would-be contributors from developing countries, such editorial assistance could make the difference between rejection and acceptance by a peer-reviewed journal.
3. Commercial organisations offer professional proofreading and editing skills for researchers wishing to publish in English language journals (e.g., "*the American journal Experts*") This, of course, has a price, and, although it is said to be a "modest" and "competitive" one, it is still very high for the average peripheral researcher.
4. A recent initiative taken by some well- established center scientific journals involve "twinning" with local journals (Heseltine 2006). This is the case of the *BMJ*, the *Lancet* and *JAMA* twinning project in Mali, the aim of which is to improve the quality (and international dissemination) of African medical journals.

But, as we can see, these initiatives, however praiseworthy they can be (and they certainly are), all support and strengthen linguistic imperialism in the sense that the growing linguistic and rhetorical monopoly and monoculture Swales referred to some years ago (Swales 2000) will be even more strongly felt through the standardisation of (Anglo American) academic rhetorical practices (see also Phillipson 1992, Mauranen 1993, among many others) to the detriment of national cultural norms and thought patterns.

## **7. CHALLENGES FOR THE FUTURE**

### **7. 1. Short-term challenges**

I believe that further progress could be made if there were a universal will to undertake certain steps. By “*universal*”, I mean a will that would involve not only scientists worldwide (those from developed as well as those from developing countries, but also governments, international associations, organisations, aid agencies, etc.). Let us now consider some short-term challenges.

A greater number of internationally recognized peripheral scientists could be appointed to the editorial advisory boards of international journals. The absence of peripheral NNES scientists as members of editorial advisory boards is indeed noteworthy. By way of example, Richard Smith (cited in Lown and Banerjee 2006), former Chief-Editor of *The British Medical Journal*, found only 2 participants from low-income countries among 111 editorial board members in "the big 5" medical journals. Such a move could result in a more careful monitoring of the proportion of submissions from peripheral scientists accepted for publication, having, for example, a fixed quota for the publications of works from the developing world.

Journals in the developed world could also solicit specific articles from peripheral researchers or publish special issues on scholarship in non-Western contexts. This would result in the dissemination of peripheral research and an increase in competition. The original and unique knowledge of a local environment will spread, and scientific communication will be enhanced.

Steps could also be undertaken to diminish the cost of scientific publications. Journal prices have jumped between 84% (UK) to 155% (USA) from 1996 to 2002, increases that exceed the UK and USA inflation rates (Fortney and Basile 1998, Arunachalam 2002, Schlimgen and Kronenfeld 2004). These figures are of course intimately related to the excessive profit margins made by society and commercial publishers for whom subscription to their journals is their only source of income. Scientists from all over the world should do all they can to persuade publishers and scientific organisations not to sacrifice the interest of “public good” to the altar of commercial interest.

Efforts should be made too to make Open (free) Access (OA) to information and self and/or institutional archiving a reality. Indeed, in spite of many efforts, OA is far from being a reality. A 2003 report commissioned by the Wellcome Trust, *Economic Analysis of Scientific Research Publishing*, indicates that the publishing industry produces about 164.000 journals and periodicals worldwide (in science, technology and medicine, 1.2 million papers are produced in 24.000 journals every year), but only 2.816 titles (half of them are peer-reviewed) are listed in the *Directory of Open Access Journals* (<http://www.doaj.org>). Few of these on-line periodicals are core, English-written journals.

([www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/39909.htm](http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/39909.htm)).

More and more academic voices claim that the OA initiative has prompted some significant and welcome steps by many scientific publishers, but in general these steps have fallen short of expectations of the proponents of this idea. It is true that some journal publishers have recently made their journals freely available to clients in developing countries, but the majority of these publishers also require university libraries to subscribe to, and obviously pay for, the paper versions of their journals. What is more, subscription prices are the same for developed as well as for developing countries, which should not be. According to statistics provided by Bioline International ([http://blogs.openaccesscentral.com/blogs/bmcblog/entry/berlin\\_5\\_and\\_developing\\_countries](http://blogs.openaccesscentral.com/blogs/bmcblog/entry/berlin_5_and_developing_countries)), in countries with a GDP capita/year inferior to 1.000 US dollars, 56% of medical



institutes surveyed had been unable to purchase any subscriptions to journals over the past five years.

With real access to information, peripheral scientists would thus be able to cite key (for the time being, English-written) references, and the ironical situation, so vividly put forward by Canagarajah (2002), where peripheral scholars are marginalized when writing about their own local communities while their center scholar counterparts achieve recognition when writing about the same topic, might no longer hold true if OA becomes a "real reality". The problem is that governments can only influence publishers indirectly. The OA provision policy itself should be mandated.

Awareness raising exercises followed by regional technical workshops to train key individuals in creating and maintaining institutional archives could also be organized if one wants to achieve a global, interoperable, free-of-charge network of published refereed literature.

When addressing such issues, we should always bear in mind that not only do information-deprived researchers need useful information to be available free on the web, but they also need the technology in place to take advantage of that information. Important investments in wireless and satellite connections could thus be made. International aid agencies (e.g. WHO, UN, UNESCO, AILA, EASE, etc) have a leading role to play in this venture.

## **7. 2. Longer term challenge: Regional (peripheral) editorial bodies and scientific multilingualism**

The following long-term proposal requires the collective effort of foundations, commercial and private publishers, national states, national research councils, science academies, government research agencies from around the world and international agencies such as those mentioned above in order to raise the funding necessary to put it into practice. The idea is to create, at regional scales (i.e., not individual, departmental,

institutional or national scales) private editorial bodies that would start up new regional high-quality referred journals that would:

a) be based in developing countries. As Diane Belcher , co-editor of the *English for Specific Purposes* (JEAP's sister journal) convincingly posits: "Certainly having more refereed publication opportunities available beyond a limited number of prestigious center journals will be a welcome development" (2006: 150).

b) publish papers written in the major (local) languages spoken by the scientists of a given peripheral region (e.g., for Latin America: Spanish and Portuguese, apart from English)

c) be especially appreciative of local perspectives

d) transcend national borders

e) be extramurally peer-reviewed

f) be accompanied by bilingual or, better still, trilingual (translated into other "lesser" languages) abstracts, titles and keywords.

g) be swapped at no cost from one region of the Third World to another, but sold at a reasonable price to center libraries/universities/research centers

h) adhere at no cost to the open access/institutional archive initiatives.

i) would at a later stage be included into the mainstream of the world scientific communication in non-English-dominated international databases so as to be able to compete on the international market.

The editorial boards of these journals would include specialized linguistic assistance, i.e., translators who would translate, upon request, the papers published. This implies that translators, terminologists, documentalists, applied linguists and language teachers will become more and more necessary in scholarly communication. Such a move would promote scientific multilingualism which is a means for science to be truly universal, as it should be. Several renowned voices recognize the future need to be multilingual and, in humanity's interest, to protect and enhance linguistic diversity (e.g., Ammon 2006, Canagarajah 2006, Mendieta et al. 2006). Hooman Momen, editor of the WHO bulletin, argues that local languages will become more and more important for the dissemination

of knowledge and that improvements in machine translations, coupled with on-line publication, could provide non-English authors with opportunities to publish in their own language.

Along the same lines, several Eastern and Western European scientific journal editors uphold the idea that because Spanish is spoken in large parts of the world, there is no doubt that journals in Spanish will have a global reach (García-Guinea and Ruis 1998, Marusic and Marusic 2006). All this would then encourage scientists to learn languages other than English. In the same vein, Leáñez Aristimuño (2007), who is the representative of the Latin Union in Venezuela, also contends that Spanish is a giant, but that it “has decided” to withdraw from all the wealth-triggering elements: science, technology, trade, finances and diplomacy. As Leáñez Aristimuño asserts, Spanish “*has it all*” to be English greatest competitor on the international scholarly stage.

Lastly, and as a consequence of the above, the reward system of peripheral scientists should change. Indeed, these researchers are today being pressured to increase their output in English and to submit it to journals published in Anglo-American countries (Bunout and Reyes 1998, Loria and Arroyo 2005, Braine 2005a, Ferguson 2007). This is what Altbach (1997: 10-11, cited in Braine 2005a) calls a “*slavish obeisance*” to both Western ideas and institutions, and “*an unfortunate straightjacket*” for scholars. Non-English written pedigreed regional journals should be accepted in any researcher's academic promotion assessment on the exact same footing as their Anglo-American counterparts are.

## **CONCLUSION**

All this is easier said than done and mere idealism cannot win. Without concerted institutional and political backing, the ideas and proposal proposed in this essay stand on weak grounds. In truth, the complete elimination of inequalities in the world of scholarship is unlikely, but progress could be achieved if there were a universal will (at institutional, *governmental* and *intergovernmental* levels) to redress the current world North/South imbalance not only in the academic/scientific domain but also in all aspects

of human life. To "universalize science" indeed means not only to cooperate actively in its creation but also to extend the fruit of its applications to the whole of mankind so that not only Europeans, North Americans, Japanese or the well-off classes of Third World countries, i.e., a privileged few, but mankind as a whole, will be able to enjoy the benefits that science and technology can provide and the opportunities these benefits bring along. Everyone is entitled to live in dignity. No doubt, science is fundamental for the industrialized world, but it is much more than fundamental for the peripheral world. For the peripheral world, science is a question of survival. Science, technology and publication form the triad that spur industrialization, wealth production, real independence and the interdependences and equilibrium that should characterize the relations of all the countries and peoples in today's world.

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