DOI: http://10.47456/argumentum.v15i2.40987

The political geoeconomics of knowledge and the challenges facing the internationalisation of graduate studies

Geoeconomia política do conhecimento e os desafios para a internacionalização da pós-graduação

Roberto LEHER*
https://orcid.org/0000-0002-5063-8753

Maria Rosimary Soares dos SANTOS**
https://orcid.org/0000-0001-5886-8003

Introduction

In spaces designated for the development of knowledge, xenophobia and chauvinist nationalism have no place. One of the first historical experiments in the dissemination of geoeconomic and political knowledge, the library and museum complex of Alexandria (C.3 BC), would not have been possible without bringing together the most brilliant minds of the time, regardless of their nationality; nor can that complex be separated from its economic and political position: Alexandria was the granary for much of the world, an economic force that arose from the territorial expansion under Alexander. Today, the political geoeconomics of knowledge can be summarised as follows: that cultural, scientific, and technological influence is related to the country's position in the global power system of capital-imperialism (Fontes, 2010).

The most ambitious and grandiose cultural project ever forged, foresaw practices that have shaped the modern concept of the university. The Museum of Alexandria "envisaged attracting the best scientists and writers of the time to that lonely place on the edge of nowhere". In the imaginative words of Irene Vallejo (2022, p. 45), "The library opened itself up to the vastness of the outside world. It included the most important works in other languages,

* Titular Professor. Doctor in Education. Professor at the Faculty of Education of the Universidade Federal do Rio de Janeiro (UFRJ, Rio de Janeiro, Brazil) (Federal University of Rio de Janeiro). Avenida Pasteur, n. 250, Urca, Rio de Janeiro, CEP.: 22290-250. E-mail: robertoleher@fe.ufrj.br.

** Associate Professor. Doctor in Education. Professor at the Universidade Federal de Minas Gerais (UFMG, Belo Horizonte, Brasil) (Federal University of Minas Gerais). Av. Presidente Antônio Carlos, n. 6627, Belo Horizonte, CEP.: 31270-901. E-mail: m.rosimary@gmail.com.

translated into Greek". For this, it was necessary to assemble a community of *wise men*, "Sages were recruited from each people who, in addition to being masters of their own language, knew Greek perfectly" (Vallejo, 2022, p. 41). Knowledge from other peoples was organised and systematised, encompassing works from different time periods, cuneiform texts were translated, translating Babylonian traditions into Greek, and treatises on India were written.

In charge of organising the library, and based on the contributions of Aristotle, Demetrius of Phalerum created the basis of the modern book classification system, dedicating his life to the "[...] effort to unite scattered pieces of the universe and form a whole endowed with meaning. A harmonious architecture in the face of chaos [...]. A refuge where we protect everything we fear to forget. The memory of the world" (Vallejo, 2022, p. 49). The creation of the library was an *exercise of hegemony* following the impressive and violent Alexandrian military campaign, which had allowed the expansion of Greece's zone of influence into new regions of Europe, Africa, and Asia.

None of this is foreign to the notions of globalisation, imperialism, and soft power. With its military campaigns Alexandria emerged as a symbolic nucleus of power, both for its pivotal economic influence and the magnitude of its cultural politics. The Museum of Alexandria led by Ptolemy, "[...] became one of the most ambitious institutions of Hellenism, a primitive version of our research centres, universities and laboratories of ideas" (Vallejo, 2022, p. 56).

This in no way negates the importance of the forms of institutional engagement of any given university, or national efforts in science and technology. However, their effectiveness depends on confronting the determinants of reflex modernisation (Ribeiro, 1969) and cultural heteronomy (Fernandes, 2008) that parameterise the so-called world-class universities. Global asymmetries are perpetuated by rankings, metrics and profiles that feed into heteronomy. As in Perrault's Cinderella, only a foot of the right size can fit the glass slipper. The predominant indicators are not consistent with the characteristics and challenges of Latin American universities.

1 Political geoeconomics of knowledge

Twenty-five Centuries have passed since Alexandria's apogee. Since then, the centre of gravity of world power has shifted several times. European universities were established, preserving similarities with the grandiose Alexandrian project, such as in their efforts to bring together people devoted to knowledge into a single community, and in their openness, in different ways, to interactions with other peoples and institutions, through the mobility of scientists, professors and students, in the setting up of libraries open to the world, and through the translation of reference works.

Universities are numbered among those rare social institutions that have survived for over a thousand years. They find their strength in the production of knowledge and in processes of teaching and learning that are often at odds with established powers. From the beginning of the industrial revolution, institutions in countries with greater manufacturing strength and with greater primitive accumulation of capital established close links with the emerging bourgeois class. From the turn of the 19th century, they became increasingly intertwined with the contingencies and specificities of bourgeois revolutions. It is impossible to ignore the

significance of the creation of the Grandes Écoles and the Napoleonic reform of French universities in facilitating the entry of, the then agrarian, France into the dynamics of the industrial revolution. The vitality of the great American universities is related to the shift of world power to the USA. Likewise, the recent Chinese scientific and technological leap is inseparable from China's geoeconomic and political position within the global power system.

An examination of the precise strength of the countries and universities leading the political geoeconomics of knowledge corroborates the hypothesis that cultural, scientific, and technological influence has strong links with the particularities of their bourgeois revolutions and, in the case of the USSR and China, of their socialist revolutions. The concept of the university autonomy of the Napoleonic institutions has different characteristics than those conceived by Humboldt at the University of Berlin; The, relatively late, American research universities, although influenced by Berlin, soon took on different features due to the growing influence of business and military investments. In the last century, the USA received many highly important individuals forced to leave Germany. By 1932, Germany had won 33 of the 100 Nobel Prizes in science. Among those who had to leave the country, the physicists Albert Einstein, Erwin Schrödinger and Max Born, and the biochemist Hans Krebs, stand out. But there is another darker side: thousands of scientists and technicians who played important roles under Nazism, particularly in the military industry complex, but also in human experiments, also relocated to the US at the end of the war[1].

The political geoeconomics of knowledge determines true centres of attraction, to which the bulk of scientific and technological production then gravitates. The US is the greatest scientific and technological power, the greatest centre for attracting 'brains' and raising funds through student fees; China is the main emerging power, it has taken the lead in sensitive technological areas and has implemented an aggressive policy of training new scientists in the principal centres and laboratories across the world to achieve even greater levels of technological sovereignty; Germany, Great Britain and France continue to be scientific and technological powers in several strategic industrial areas. Although polycentric, these new Alexandrias are undergoing accelerated relocation. Latin America and Africa are not at the dynamic centre of this movement.

1.1 USA, Science, technology, and global power

One of the main indicators of a country's power in the processes of scientific, technological and innovation knowledge is the number of relevant patents. The *Trade-Related Aspects of Intellectual Property Rights* (TRIPS), established in 1994 by the World Trade Organisation (WTO), embodies the most comprehensive and restrictive regulation of intellectual property. Just when the ideology of globalisation and the *knowledge society* were in vogue, an agreement was signed that was extremely favourable for corporations and countries holding strategic patents, which restricted access to knowledge essential to humanity for long periods, even in areas considered public, such as the human genetic code.

[1] Operation Paperclip: a secret US intelligence programme in which more than 1600 German scientists, engineers and technicians who worked in Nazi Germany were brought to the United States, between 1945 and 1959, to work for the government (OPERATION PAPERCLIP, 2023, not paginated).

The USA is in the world leader in IP5 (Intellectual Property) patents, which bring together patents registered in the European, Japanese, Korean, The People's Republic of China and the US Offices. The US continues to expand its domain, increasing IP5 patents from 220,245 in 2015 to 269,418 in 2019, with an emphasis on big data, cyber security, life sciences, digital health, and energy innovation. The same trend is seen in scientific publications. 2011 saw 476,100 and 2019 saw 538,300, especially in the areas of energy, artificial intelligence and robotics, nanotechnology, materials, electronics, and optics. 40% of these publications had foreign co-authorship, a rate higher than that of the Organisation for Economic Cooperation and Development (OECD) with 34%. The US has 1.43 million active researchers. In 2017, 64% of new Doctorates were in the areas of science and engineering and 34% were foreigners (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021).

After the 2009 and 2012 crises, spending on Science and Technology (S&T) and Research and Development (R&D) increased significantly: from 2.68% of Gross Domestic Product (GDP) in 2012 to 3.08% in 2019, with an emphasis on the pharmaceutical industry, information technology, electronics and optics, aerospace, and industrial services. Expenditure on S&T in the USA grew (in purchasing power parity) from 450 billion US$ in 2010 to more than 600 billion US$ in 2019. It is necessary to highlight a particularity that distinguishes the USA. Regarding spending on R&D, most investments are managed by the manufacturing sector (70%), 22% by the Federal government and only 3.6% by universities (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021). Despite the high percentage of exports of high technology products, this lost ground to China, falling from 29% in 2008 to 19.1% in 2019. Regarding Federal expenditures (2018), resources went predominantly to the Department of Defence ($52 billion) and Health ($36.9 billion). The National Science Foundation (NSF), responsible for funding projects not directly military or related to the productive sector, received significantly less, US$ 6.3 billion (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021).

Indicators confirm US prominence in global science, but not as open science. The scale of investments under the control of the manufacturing sector and the enormous scale of military spending are not consistent with horizontal and solidary international cooperation. The international agreements and conventions with the US refer to the university system financed by the NSF, in which the order of magnitude of resources is smaller and in which many restrictions to the free circulation of knowledge persist.

1.2 China: changes in global power

Having achieved enormous participation in the world economy (ranked 2nd for global GDP), China has altered its place in the global power system, especially regarding higher value-added products. Recently, the country has assumed spaces within university leadership. It has achieved a university ranking with worldwide influence (that of Jiao Tong University, in Shanghai) and boosted the coalition of universities in the BRICS countries (Brazil, Russia, India, China and South Africa). Its universities stand out in international studies on strategic technologies, including artificial intelligence, robotics, biotechnology, energy, nanotechnology, materials, and optoelectronics. These conquests would not have been possible without the country's economic, population, technological and military strength. The priority given to S&T and R&D development in new energy matrices, to climate change,

together with its emphasis on multilateralism has projected Chinese universities into the world.

China increased its spending on research from US$ 135 billion in 2008 to more than US$ 440 billion in 2018 (OECD, 2021). Alongside the USA, it leads the world in scientific publications, increasing 150% in just six years (644,600 in 2019, 24.5% of total publications) (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021). The two countries are currently responsible for 45.6% of the world's scientific publications.

The worldwide distribution of IP5 patents in 2019 is illustrative: China accounted for 29.3%, the US for 20%, Japan for 18.4%, the European Union for 14.4%, Korea for 10.4% and the other G-20 countries, including Brazil, a paltry 0.4%. (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021). China has 1.87 million researchers, taking its place as a new centre of world scientific power owing to its training of personnel at a global level, its patents, and the complexification of its production chains. The force behind the internationalisation of S&T in China is solidly based on national foundations, unlike countries that passively follow the modernisation reflex.

1.3 Brazil: doing science against the grain

During the period of import substitution and, especially, by the provision of the necessary infrastructure for monopoly capitalism during the business-military dictatorship (1964-1985), Brazil substantially expanded its technological development in areas such as the aerospace industry, agronomy, energy, telecommunications, steel, heavy civil engineering, in the auto parts sector of the automobile industry, segments that underpinned the vertiginous expansion of postgraduate courses in public universities. Between 1950 and 1980, Brazil promoted placements into universities in the USA and Europe to undertake Doctorates in priority areas for the economy and for the political geoeconomics of knowledge. These individuals went on to become leaders of postgraduate programmes and the R&D departments of state-owned enterprises. In the early 1960s, the country had just under 50 Master's and Doctoral programmes, by 1985 the total exceeded 1100. In this period, industrialisation also developed in strategic areas, giving Brazil the industrial leadership of Latin America.

The fragility of the foundations of the country's scientific and technological autonomy under dependent capitalism became evident during the debt crisis of 1982. The Structural Adjustment Programmes of the International Monetary Fund (IMF) and the World Bank (WB) paved the way for the neoliberal system of accumulation. Since then, a process of de-complexification of production chains and expansion of the commodities sector has been underway. In 2016, the percentage of high technology products in exports of manufactured goods was 14.3%, by 2018 it had fallen to 13% (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021). Currently, the bulk of the country's exports are products with low or modest technological content, and this is reflected in spending on research.

The downward trend in investment in R&D by manufacturing industry is reflected in the drop in the number of service companies connected with R&D: from 1,682 firms in 2014 to 1,394 firms in 2017. This has been accompanied by a sharp reduction in the number of

researchers and technical leaders involved in industrial R&D: from 105,400 in 2015 to 89,700 in 2017. This explains the low rate of IP5 patents, which remained stagnant between 2015, with 1211, and 2018, with 1276. The number of academic researchers continues to grow, but at a low level considering the population: in 2015: 61 thousand; in 2017, 66 thousand (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021).

In the last five years, Brazil has experienced a systemic shrinkage in the areas of S&T and R&D. Brazil reduced its expenditure in this sector, from US$ 30 billion in 2013 to less than US$ 25 billion in 2018. Federal expenditures fell from US$ 4.23 billion in 2015 to US$ 3.17 billion in 2018. Adding all expenditure, companies, higher education and government, the drop was from US$ 41.3 billion in 2015 to US$ 34.9 in 2017 (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021), the year in which the *mother of all austerity measures* came into being in the form of Constitutional Amendment - EC 95/2016. The Bolsonaro government's culture war further exacerbated the problem. The budget for the main support for research infrastructure, the non-reimbursable National Fund for the Development of Science and Technology (FNDCT), shrank from US$ 600 million in 2014 to a paltry US$ 115 million in 2021.

Despite the budgetary hardships and the harshness of the culture war waged by the Bolsonaro government (Leher, 2021), scientific production in the form of published articles continued to grow: between 2011 and 2019, the total rose from 49,300 to 74,300. These publications have significant rates of foreign co-authorship (34%), especially with the USA, United Kingdom, Germany, Spain, and France, although, in general, Brazilians appear as the fourth or fifth contributor (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2021).

In the last two decades, progressive Latin American governments have sought to expand technological integration and cooperation strategies. There are associations of Latin American universities such as the Association of Universities of the Montevideo Group, as well as sub-regional bodies such as the Unesco International Institute for Higher Education in Latin America and the Caribbean, the Union of South American Nations, and the Common Market of the South. They depend, however, on the correlation of forces of the governments of the region. Many institutions participate in the international movement in favour of open science, the Budapest Declaration[2], which serves as an agent for the strengthening of horizontal policies of international cooperation. Furthermore, within academia, relevant interactions between research groups and academic units are under way, some permitting joint tutorship and double degrees. Regarding the application of knowledge in the economy and in facing major national problems, cooperation is still embryonic and, as we address below, the guidelines and metrics of internationalisation are reproducing the asymmetries of the political geoeconomics of knowledge.

[2] Which can be accessed at: https://www.budapestopenaccessinitiative.org/boai10/portuguese-brazilian-translation/. BUDAPEST OPEN ACCESS INITIATIVE. **Prólogo**: A Iniciativa de Acesso Aberto de Budapeste 10 anos depois. Budapeste: BOIA, ©2023. Available at: https://www.budapestopenaccessinitiative.org/boai10/portuguese-brazilian-translation/. Accessed on 20/02/23.

2 Reproduction of asymmetries: *rankings*

University *rankings* establish a hierarchy in the institution's sphere of influence and world prestige. Those at the top attract more students with high purchasing power and performance excellence, prestigious professors, and resources from national and international public and private agencies. It is through ranking agencies that the internationalisation of a university institution becomes known. Among the most prominent are the *Times Higher Education* (THE), *Quacquarelli Symonds World University Rankings* (QS), and the *Academic Ranking of World Universities* (ARWU) by Shanghai Jiao Tong University's Institute of Higher Education. In these, no Brazilian institution is among the 100 best in the world: the USA has 27 in the QS and 38 in THE; the UK has 17 in the QS and 11 in the THE, China 6 in both rankings. Only the University of São Paulo (USP) is among the 200 in the QS (115), but not in the THE. Despite the excellence and relevance of Brazilian public universities, they do not fully fit the criteria; they are, however, feverishly chasing a better place in the front ranks. In this pursuit, relevance to national problems, the history of the institutions, and national political and economic fluctuations are devalued. One of the corollaries of the *ranking's* methodology is the incorporation of the belief that the place attained by each institution depends exclusively on intramural efforts and entirely disregards the existence of broader determinants.

Debates on the subject often ignore the criteria used for *rankings*. An example is illustrative: examining the methodology[3] of the Shanghai Ranking (ARWU) we observe that it considers all universities that have Nobel Prizes, Fields Medals, Highly Cited Researchers, or articles published in *Nature* or *Science*. More than 2,000 universities are ranked and the top 1,000 are published. The university's ranking considers the number of students and professors who received the Nobel and Fields prizes (30% of the final grade). This means that countries without recent winners are playing for only 70% of the points. Publication in two journals, *Nature,* and *Science,* make up another 20% of the assessment. So, half of the evaluation consists of Nobel Prizes, Fields, and citations of articles in two journals. As quality is comparative, for each indicator the institution with the highest index is given a score of 100 and the scores of other institutions are calculated as a percentage of the maximum score. The concentration of Nobel Prizes creates a strong asymmetry: Oxford (55), Harvard (50), Princeton (49), Johns Hopkins (29) (to 2019). The calculation methodology exacerbates inequality, it is not enough to be excellent; it is necessary to attain a high percentage of the indicators of institutions that already occupy the leadership of the *ranking.* The use of the same metric to assess the international influence of whole countries based on the *rankings* erases these marked contrasts. The US has 400 Nobel laureates, the UK 138, Germany 111, France 71[4]. Brazil has no laureate and even the Brazilian Arthur Ávila, who won a Fields medal, is currently a naturalised Frenchman.

Even when considering the criteria in which Brazil *is* competitive, in international publications, the focus is on just two journals, *Nature* and *Science*, and does not consider the presence of Brazilian research in, for example, the agriculture sector, in the humanities, in the social sciences and in the arts, themes not prioritised by these journals. Furthermore, in an

[3] SHANGHAI RANKING CONSULTANCY. **Shanghai Ranking's Academic Ranking of World Universities**: Methodology 2021. Shanghai, ©2023. Available at: https://www.shanghairanking.com/methodology/arwu/2021. Accessed on: 12/02/2023.

[4] WORLD POPULATION REVIEW. **Nobel Prizes by Country 2023.** California, ©2023. Available at: https://worldpopulationreview.com/country-rankings/nobel-prizes-by-country. Accessed on: 12 Feb. 2023.

editorial, the journal *Nature* urged against using the impact factor as an evaluation of the articles published in it. In 2004, for example, 89% of citations referring to their articles were generated by only 25% of their articles (Gingras, 2016).

As Gingras (2016) points out, bibliometrics are crucial for the study of the dynamics of science. However, the excessive measurement of citations has assumed worrying characteristics for science. In fact, in the neoliberal context, especially in the late 1990s, the instrumental misuse of bibliometrics ignores the immense diversity of publications across areas. In the case of the humanities 75% of publications are in book form, while in physics 80% are in journals; in biomedical and natural sciences the average number of authors increased from 2 in 1960 to 6 in 2014; the percentage of publications with more than one author, in 2014, was 95% in biomedicine, 92% in natural sciences and engineering, 70% in social sciences and 12% in humanities. Due to the political geoeconomics of knowledge, the network of collaborations (especially between the first two authors) is basically concentrated in the G7. The adoption of *ranking* metrics is a procedure that is alien to university life.

Furthermore, the main citation measurement agencies have taken an unequivocal commercial stance. The *Institute for Scientific Information* (ISI) was founded in 1959. In 1963, the ISI started to develop the *Science Citation Index* (SCI). SCI was acquired in 1993 by Thompson Reuters achieving revenues of US$ 13 billion. In 2013, Thompson Reuters acquired Avedas. In 2016, *Clarivate Analytics* acquired Thompson Reuters and, in a clear monopoly process, purchased, in 2021, for US$ 5.3 billion, ProQuest, until then a competitor of Web of Science (which had been acquired in 2017 by Clarivate). The bulk of scientific classification and records are under unequivocal monopoly control.

3 Internationalisation of the Plano Nacional de Pós-Graduação and Student Mobility

The institutionalisation of graduate studies (Pós-Graduação (PG)) in Brazil was one of the first acts of the business-military dictatorship, by means of Parecer nº 977/65. It made no quibbles about its intentions: to build a system in the image and likeness of the US system, which it considered an exemplar. The 1st National Postgraduate Plan (Plano Nacional de Pós-Graduação (PNPG)) (Brasil, 1975), presented in July 1975, sought to operationalise the objectives set out by the university reform of 1968, referenced in the reflex modernisation referred to by Darcy Ribeiro (1969). The 2nd (1982-1985) and 3rd PNPGs (1986-1989) advanced the institutionalisation of graduate studies in the country. In the 2nd Plan, the word *exchange* appears only once stating that "[...] original research is not the only mechanism for training and improvement in teaching [...]" (Brasil, 1982, p. 179), but rather, the "[...] permanent updating through monitoring of the most recent specialised publications and participation in congresses, seminars, meetings and exchanges [...]" (Brasil, 1982, p. 179) and by evaluation.

The global and national economic crisis of the 1980s imposed a reordering of the production bases of dependent capitalist countries, with repercussions for S&T producing institutions. Since then, PNPGs have included proposals such as, the defence of the diversification of funding sources and, greater flexibility in course structures. They advocate the "[...] strengthening of international technical cooperation programmes intended to facilitate the exchange of teachers and researchers with their peers from institutions abroad [...]" (Brasil, 1986, p. 206).

In the 3rd PNPG, internationalisation was not related to economic and social development projects, nor to policies that strengthened the country's scientific and technological sovereignty. In a peculiar way, internationalisation came to be viewed as a key and definitive variable for the prestige of the researcher, the group, the centre, or the institution, normally measured by 'private' indicators as discussed in the previous section.

Internationalisation gained greater centrality and became part of the solid core of the 2005-2010 and 2011-2020 PNPGs. The latter states that, universities and their graduate programmes should be "[...] made responsible for their international insertion or for their ability to offer courses of international standard" (Brasil, 2010, p. 128). Along the same line, the classification of programmes at levels of excellence 6 and 7 will have as their "[...] evaluation parameters, the comparison with international programmes considered as *reference*" (Souza, 2018, p. 97). The examination of internationalisation and international cooperation in chapter 11 of the Plan associates the consolidation of graduate studies "[...] with the growth of Brazilian science, expressed above all by the progress in scientific production, measured by the publication of articles in journals with internationally indexed circulation" (Brasil, 2010, p. 223). The focus on publication indicators led CAPES (A Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Higher Education Personnel Improvement Coordination)) to advocate that, in terms of average citations of scientific articles, Brazil is ahead of other BRICS countries (Brasil, 2010) (which is true in specific areas, such as studies of arboviruses, Zika, for example, and in certain areas of agricultural), whilst ignoring the complexity of the political geoeconomics of knowledge: while Brazil has become an exporter of raw *commodities* to China, China exports *high value-added products* to Brazil.

As internationalisation in the PNPGs does not have organic links with actions related to the political geoeconomics of knowledge. The evaluation criteria focus on part of the problem but hide the most relevant and pivotal issues. The student mobility agenda, for example, emphasises the entry and exit flows, institutions, areas and countries, variables that shed light on part of the problem, but in a decontextualised way vis-à-vis the political geoeconomics. Due to the end of free studies (or at least the abrupt increase in fees) and the student debt crisis, many American and British universities, for example, have a professionalised policy for attracting foreign students, in general accompanied by strong *marketing*. Without these students, institutions could not even afford the payroll of their professors, technicians, and administrators. In countries that guarantee free study, the commercial variable of mobility is irrelevant. More important is the existence of measures of horizontal reciprocity and connections between research groups and undergraduate and post-graduate programmes; co-supervision, reciprocal recognition of degrees and double degrees; and stimuli to steer students toward strategic areas that need consolidating in the country sending the students, such as China.

One of the main measures in favour of internationalisation during the term of the 2011-2020 PNPG was Edital (Public Notice) Nº. 41/2017 that established the Institutional Internationalisation Programme – CAPES PrInt, with the objective of selecting "Institutional Projects for the Internationalisation of Higher-Level Institutions or Research Institutes". Of the 82 institutions that were approved by documentary evaluation and went through the analysis of merit and ranking of proposals, only 36 obtained final approval, predominantly federal universities in the Southeast and South, only four state universities (the three in the state of São Paulo and the State University of Rio de Janeiro), and the Pontifical Catholic

Universities of São Paulo and Rio de Janeiro received final approval. Most institutions are from the Southeast-South (Brasil, 2017), demonstrating the absence of national objectives. Since the launch of CAPES-PrInt, it has been expressly recommended that the programme aim at learning in more advanced centres, so countries in Latin America, Africa, South Asia, or European countries such as Portugal and Spain would not, therefore, be well evaluated. These guidelines disregard the fact that internationalisation cannot ignore the centrality of national problems and, of people's problems at the global level, such as the challenges of climate change, sovereignty, food security, new pandemics, overcoming racism and other forms of discrimination, and global social inequality.

It is evident that the final conclusions and recommendations of the 2011-2020 PNPG (BRASIL, 2010) were not implemented following the passing of EC 95/2016. Under the Bolsonaro government, budget cuts for universities and science were motivated by the cultural war, aiming to extirpate the scientific field from Brazil (Leher, 2021).

According to Unesco (2022), in 2019 more than 6 million students were enrolled in higher education outside their country of citizenship. The USA, Australia, UK, Germany, Russia, Canada, and France together hosted over 50% of all international students globally, with a third of all international students studying in just three English-speaking destinations: the USA, Australia and the UK United. Asian students accounted for more than 50% of international students. The largest number of students came from China, India, and South Korea. In 2019, Brazil received 21,803 higher education students – but not as fee paying students, as most, from Africa and Latin America, were enrolled in public institutions – and sent 81,719 abroad. For Brazil, the net flow of international students in 2019 was -59,916 (Organização das Nações Unidas para a Educação, a Ciência e a Cultura, 2022).

Conclusion – Dialogical internationalisation to overcome cultural heteronomy

As most of the research in Brazilian universities occurs through direct a connection with postgraduate courses, it is inevitable that the theme of internationalisation is centralised there. Not by chance, the PNPG has been giving increasing weight to internationalisation and, currently, only programmes with expressed indicators of internationalisation can attain Capes grades 6 and 7.

The main problem with this increasing emphasis on internationalisation indicators is the decontextualisation of the theme and its metrics. The disregard of political geoeconomics of knowledge is at the root of the problem, as it ignores the robust evidence that the ascendence of countries and their university and scientific institutions worldwide depends on strategies that were either inscribed in bourgeois revolutions – as in the classic cases of France, Germany, USA and Korea –, or in the midst of socialist revolutions with their peculiarities, as in the USSR and, more recently, China. Without self-impelled economic and social development policies, these countries would not have moved within the system of imperialist states and so would not have been able to leverage their university institutions, projecting them onto the world stage.

The link between knowledge centres and political geoeconomics has been recognised at least since the heyday of the Alexandria library and museum, an experiment in which the effort to develop knowledge institutions linked to geoeconomic and political repositioning strategies

stands out. Indeed, political geoeconomics makes it possible to identify differences in the scale of the scientific and technological base between countries that can only be overcome by transforming productive forces and production relations by incorporating knowledge into production chains. This requires large budgets for S&T, profound restructuring of universities and, in the case of the manufacturing sector, strong state inducements, including non-reimbursable resources for strategic areas (energy, and the industrial complexes of health, agroecology, transportation, internet security, etc.).

The main thrust of this text is that the internationalisation of universities is inseparable from bourgeois revolutions and any future projects undertaken by power blocs. To ignore these mediations is to misunderstand the system of states that forms current imperialism. There is no doubt that the *ranking* indicators are congruent with the practices already established in the hegemonic core countries, notably the USA, which comfortably leads the world university hierarchy. The main criteria of the *rankings* are in accordance with the centripetal forces that position the USA within the system of states.

This hierarchy is being challenged by China, which has established technological innovation in strategic areas as a national project. This constitutes a national policy for the training of highly qualified personnel in public universities in a coordinated way, by sending staff to universities around the world, developing reverse engineering, promoting high technology industries, and capitalising on its research centres and universities. Economic strength underpins the country, which now leads important coalitions such as the BRICS universities and plays a leading role in coalitions such as the *International Panel on Climate Change*.

Brazilian experiments have virtuous ties with international academic relations, but these are fragile due to the heteronomous bases of such interactions. Until the 1960s, the bulk of advanced research were sponsored by US foundations. Then, during the dictatorship, it was driven by the imperatives of monopoly capitalism. After the debt crisis of 1982, Brazil suffered a pronounced de-complexification of its production chains. So, rather than associating postgraduate internationalisation with these problematic *rankings*, a successful internationalisation strategy should rather be anchored in national projects, in the strengthening of the S&T system, and in the centrality of universities and S&T institutions. It is those countries that guarantee institutions a proper infrastructure, autonomy, real dedication, attractive careers, and student assistance that can then serve as a platform for horizontal and dialogic interaction with other countries, institutions, and areas of knowledge. The model of islands of excellence anchored in fragile institutions ignores that stagnation cannot be sustained for long.

The fundamental assumption is a commitment to overcoming the problems and challenges of humanity, highlighting the pertinence of international collaboration as part of a nation's effort - and State policies - in favour of sovereignty and international solidarity in the face of a world system which reproduces inequalities and asymmetries, corrodes the sovereignty of peoples, and feeds back the foundations of dependent capitalism and cultural heteronomy.

It is crucial that policies to encourage internationalisation have defined lines capable of strengthening the particularities of S&T and R&D. The provision of resources and the promotion of the production sectors (R&D) must be included in industrial policies, and in dialogue with universities. State resources and the means to promote science, technology,

culture, and art cannot, however, be consumed by the logic of R&D. Such movements are negative for universities that may consequently be weakened in their research functions, their teaching and learning processes, and their commitment to the challenges of peoples and to the logical and epistemological problems of contemporary science whilst, at the same time, being equally negative for the R&D that should be embedded in the strategies for the production of commodities.

Commitment to humanity's dilemmas requires actions that permit the modification of the correlation of forces in the political geoeconomics of knowledge. The sharing of laboratories and the mobility of students, professors, technicians, and administrators between countries willing to strengthen horizontal and dialogical interaction is a political movement that has roots in the experiences of peoples. Unesco made efforts to be a space for plans for educational, cultural, and scientific cooperation, but the interaction of forces prevented its effectiveness from the 1970s onwards. The New World Economic Order movement also advocated the sharing of knowledge between peoples, an initiative that was drastically interrupted with the TRIP-WTO agreement.

The world is faced with extraordinary opportunities. There is no longer any doubt that without global efforts it will be impossible to confront pandemics, climate change, hunger and the social inequality that nourishes the spectre of fascism in the 21st century. Brazilian universities are prepared and eager for new internationalisation practices that make real a new political geoeconomics of knowledge based on the value that knowledge committed to wellbeing cannot be imprisoned by the commodification and militarisation of science.

REFERENCES

BRASIL. Ministério da Educação. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). **I Plano Nacional de Pós-Graduação (PNPG) 1975-1979**. Brasília, DF: CAPES, 1975. Available at: https://www.gov.br/capes/pt-br/centrais-de-conteudo/i-pnpg-pdf. Accessed on: 20 Dec. 2022.

BRASIL. Ministério da Educação e Cultura. Secretaria de Educação Superior. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). **II PNPG:** Plano nacional de pós-graduação (PNPG) 1982-1985. Brasília (DF): MEC, 1982. Available at: https://www.gov.br/capes/pt-br/centrais-de-conteudo/ii-pnpg-pdf. Accessed on: 20 Dec. 2022.

BRASIL. Ministério da Educação e Cultura. Secretaria de Educação Superior. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes). **III PNPG**: Plano Nacional de pós-graduação (PNPG) 1986-1989. Brasília (DF): MEC, 1986.
Available at: https://www.gov.br/capes/pt-br/centrais-de-conteudo/iii-pnpg-pdf. Accessed on: 20 Dec. 2022.

BRASIL. Ministério da Educação e Cultura. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes). **Plano nacional de pós-graduação (PNPG)**: 2005-2010. Brasília (DF): MEC, 2004. Available at: https://www.gov.br/capes/pt-br/centrais-de-conteudo/pnpg-2005-2010-pdf. Accessed on: 20 Dec. 2022.

BRASIL. Ministério da Educação. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes). **Plano nacional de pós-graduação (PNPG)**: 2011-2020. Volume 1. Brasília (DF): MEC, 2010. Available at: https://www.gov.br/capes/pt-br/centrais-de-conteudo/livros-pnpg-volume-i-mont-pdf. Accessed on: 20 Dec. 2022.

BRASIL. Ministério da Educação. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes). **Programa Institucional de Internacionalização** – Capes-PrInt. Edital nº. 41/2017. Brasília (DF): Capes, 2017. Available at: https://www.gov.br/capes/pt-br/centrais-de-conteudo/10112017Edital412017InternacionalizacaoPrInt2.pdf. Accessed on: 20 Dec. 2022.

BUDAPEST OPEN ACCESS INITIATIVE. **Prólogo**: A Iniciativa de Acesso Aberto de Budapeste 10 anos depois. Budapeste: BOIA, ©2023. Available at: https://www.budapestopenaccessinitiative.org/boai10/portuguese-brazilian-translation/. Accessed on: 20 Feb. 23.

FERNANDES, F. **A revolução burguesa no Brasil**: um ensaio de interpretação sociológica. São Paulo: Ed. Globo, 2008. (1.ed. Rio de Janeiro: Zahar, 1975).

FONTES, V. **O Brasil e o capital-imperialismo**: teoria e história. Rio de Janeiro: Editora UFRJ, 2010.

GINGRAS, Y. **Os desvios da avaliação da pesquisa**: o bom uso da bibliometria. Trad. Carlos Deanne. Rio de Janeiro: Ed. da UFRJ, 2016.

LEHER, R. Educação e Ciência após 2018: neoliberalismo extremo e guerra cultural. Trabalho Encomendado. *In*: REUNIÃO NACIONAL DA ANPED, 40., 2021, Caxambu. **Anais [...]**. Caxambu, 2021. Available at: http://anais.anped.org.br/sites/default/files/gt11-trabalho_encomendado_40rn.pdf. Accessed on: 15 Dec. 2022.

OPERAÇÃO PAPERCLIP. *In*: WIKIPÉDIA, a enciclopédia livre. Flórida: Wikimedia Foundation, 2023. Available at: https://pt.wikipedia.org/w/index.php?title=Opera%C3%A7%C3%A3o_Paperclip&oldid=65142979. Accessed on: 5 Jan. 2023.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. OECD Main Science and Technology Indicators. R&D Highlights in the March 2021 Publication. **OECD Directorate for Science, Technology, and Innovation**, 2021. Available at: https://www.oecd.org/sti/msti-highlights-march-2021.pdf. Accessed on: 18 Dec. 2022.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS PARA A EDUCAÇÃO, A CIÊNCIA E A CULTURA. UNESCO Science Report: the race against time for smarter development, 2021. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000377433?. Accessed on: 20 Dec. 2022.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS PARA A EDUCAÇÃO, A CIÊNCIA E A CULTURA. **UNESCO Institute for Statistics**, 2022. Available at: http://data.uis.unesco.org/. Accessed on: 20 Dec. 2022.

RIBEIRO, D. **A universidade necessária**. Rio de Janeiro: Editora Paz e Terra, 1969.

SOUZA, J. F. **Itinerários da internacionalização da Educação Superior Brasileira no âmbito da América Latina e Caribe**. 2018. Tese (Doutorado em Educação) -Programa de Pós-Graduação em Educação, Conhecimento e Inclusão Social, Universidade Federal de Minas Gerais, Belo Horizonte, 2018.

VALLEJO, I. **O infinito em junco**: a invenção dos livros no mundo antigo. Rio de Janeiro: Intrínseca, 2022.

WORLD POPULATION REVIEW. **Nobel Prizes by Country 2023.** Califórnia, ©2023. Available at: https://worldpopulationreview.com/country-rankings/nobel-prizes-by-country. Accessed on: 12 feb. 2023.

Roberto LEHER Worked on the conception and design of the article.
Titular Professor at the Faculty of Education and of the Graduate Programme in Education at the Universidade Federal do Rio de Janeiro (UFRJ) (Federal University of Rio de Janeiro) on the theme of State, Work and Social Movements. Doctorate in Education from the Universidade de São Paulo (USP) (University of São Paulo) (1998). Research developer in public policies in education. Works in the Coletivo de Estudos em Marxismo e Educaçao (COLEMARX) (Collective of Studies in Marxism and Education). Researcher for the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) (National Council for Scientific and Technological Development), "Cientista de Nosso Estado" with the Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro (FAPERJ) (Research Support Foundation of the State of Rio de Janeiro) and collaborator at the Escola Nacional Florestan Fernandes (Florestan Fernandes National School). Rector of the Federal University of Rio de Janeiro (July 2015 to July 2019).

Maria Rosimary Soares dos SANTOS Worked on data analysis and interpretation.
Holds a degree in Social Sciences from the Universidade Federal de Minas Gerais (UFMG) (Federal University of Minas Gerais) (1992), a Master's degree in Political Science from the Universidade Federal de Minas Gerais (1996), a Doctorate in Education from the Universidade Estadual Paulista Júlio de Mesquita Filho (UNESP) (São Paulo State University) (2007) with a postdoctoral degree at the Universidad Nacional de San Martín (UNSAM) (National University of General San Martín) - Argentina and at the Universidade Federal do Rio de Janeiro (UFRJ) (Federal University of Rio de Janeiro) (2010) and the Universidade Federal de Pará (UFPA) (Federal University of Pará) (2018-2019). Currently Associate Professor at the Federal University of Minas Gerais. Coordinator of the theme of Public Policies in Education of the Graduate Programme in Education - Knowledge and Social Inclusion (08/2019 to 08/2021).
