In 1967 George Basalla argued that a small circle of Western European nations was the cradle of modern science. Italy, France, England, the Netherlands, Germany, Austria, and the Scandinavian countries provided “…the scene of the Scientific Revolution which firmly established the philosophical viewpoint, experimental activity, and social institutions we now identify as modern science” [2: 611]. According to Basalla, science spread round the world from this relatively small geographical base.

At the same time, in *The two cultures and the scientific revolution*, C. P. Snow denounced the existence of two cultures as being undesirable and indeed detrimental to the pursuit of interdisciplinarity [9]. These days there is a great deal of support for this idea, and Basalla's thesis has been strongly contested by those who argue that traditional scientific centres and peripheries are both vital for the production, circulation, appropriation and recognition of knowledge [4].

These two influential works, along with recent historiographical production which argues in favour of “scientific excellence on the periphery” and extols the action of technicians and collaborators of scientists who were *geniuses*, provided the impetus for the exhibition entitled “Lacerda 120” [3], [1]. This year being the 120th anniversary of the birth of Armando de Lacerda (1902–1984), we seek to place the renowned Portuguese phonetician in a broader context, among his peers, assistants and other (newly discovered) actors. From the outset, this was one of the main features of the exhibition. Lacerda is portrayed in a number of group photographs taken at the 1st and 3rd International Congresses of Phonetic Sciences held in Amsterdam in 1932 and Ghent in 1938, respectively, which he attended. The exhibition as a whole includes photographs of Giulio Panconcelli-Calzia (1878–1966), Paul Menzerath (1883–1954) and Martin Joos (1907–1978), Lacerda’s mentors, as well as images of some of his disciples and collaborators, such as António Almeida (*1946), Göran Hammarström (1922–2019), Maria Josefa Canellada (1912–1995), Francis Millet Rogers (1914–1989), Sue Nogueira (*1930) and Peter Strevens (1922–1989).

Although Armando de Lacerda was a recognized phonetician of global renown, at the Faculty of Arts of Coimbra, where he was head of the Experimental Phonetics Laboratory, he was officially designated as a member of the “technical, auxiliary and ancillary staff” [5]. The photographs of Lacerda on field work, along with collaborators, his driver, and the local people from rural areas in the Alentejo and Algarve regions whose speech he recorded in the early 1950s, illustrate the collective nature of knowledge and indicate as part of the exhibition the recent recognition by historiographers assigned to the role of “invisible technicians” [7], [6].

Lacerda's disciples and collaborators, who came from universities as far away as Harvard in the USA, Uppsala in Sweden, São Salvador da Bahia in Brazil, and Accra in the Gold Coast, for example, sought specialist training under his supervision at the Experimental Phonetics Laboratory in Coimbra, and the exhibition illustrates how Portugal, which was predominantly regarded in the 1930s and 60s as being a backward,
picturesque country, in fact displayed a remarkable degree of scientific centrality in the field of experimental phonetics [5].

In connection with the issue of interdisciplinarity, a feature of the exhibition is a special room at the Coimbra Phonetics Laboratory containing the instruments of the laboratory, most of them designed by Lacerda himself, a philologist by training, and a self-styled experimentalist who, for this reason, would only pronounce on a subject “after the devices have proved their worth”\(^1\). The protocol signed in 2020 for collaboration between the University of Évora and the University of Coimbra was aimed at the recovery of the history of the Coimbra Phonetics Laboratory, and enabled its instruments, held by the University of Coimbra Science Museum, to be transferred to the headquarters of Ferraz de Lacerda, Lda. – and the exhibition curators and authors of this text are grateful to the head of the Science Museum, Dr. Paulo Trincão, and the curator of scientific instruments, Dr. Gilberto Pereira, for their collaboration.

Held in the house lived in by Armando de Lacerda, which has been owned by the family for over 120 years, the exhibition also tells us much about Lacerda’s family life, including a collection of his documents from the family archive, held by his grandson, Paulo de Lacerda, who in recent years has grown the archive with the addition of the António Almeida fund, donated by himself, and the Göran Hammarström fund, donated by his daughter Marika Hammarström. The fact that the exhibition portrays Lacerda’s professional and family life does not preclude the notion of the global responsibility of the project, and the curators decided to invite Irina Kostyuk from Ukraine to bear witness to the importance of the “Sharing European Histories” project (EuroClio; Evens Foundation), which demonstrates to groups of schoolchildren the importance of the “Lacerda polychromograph” as an example of how, even during a period of nationalism and authoritarianism such as the 1930s, when the instrument was invented, it was possible to establish bridges and a dialogue between scientists from a number of countries living under different political regimes [8].

**Funding**

The Instituto de História Contemporânea (Institute of Contemporary History, University of Évora Unit) receives national funding from the FCT – Fundação para a Ciência e a Tecnologia under projects UIDB/04209/2020 and UIDP/04209/2020. This research was also funded by the FCT under projects 2021.00906.CECCIND and 2022.06811.PTDC (Phonetics Laboratory: Coimbra – Harvard. Rethinking 20th-century scientific centres and peripheries, PHONLAB), and by the private company Ferraz de Lacerda, Lda.

**References**


\(^1\) Armando de Lacerda’s opinion in a letter to Leif Sletsjöe dated 19th December 1949 (Biblioteca do Laboratório de Fonética. Faculdade de Letras de Coimbra).


Figure 1. Inauguration of the Lacerda 120 – 5th International Workshop on the History of Speech Communication Research at the University of Porto rectory, during which the exhibition was held. From left to right: Paulo Lacerda, Jürgen Trouvain, Quintino Lopes, Rui Silva, António Candeias and João Veloso. (Photograph: Renato Roque)

Figure 2. Exhibition and Lacerda 120 – 5th International Workshop on the History of Speech Communication Research held at the head office of Ferraz de Lacerda, Lda. in Porto.
Figure 3. 1st International Congress of Phonetic Sciences (Amsterdam, 1932). Those identified are Armando de Lacerda and Berta Lacerda, his wife and collaborator. (Photograph: Arquivo Familiar Paulo de Lacerda)

Figure 4. Detail of a group photograph from the 3rd International Congress of Phonetic Sciences (Ghent, 1938). Centre: Armando de Lacerda, wearing glasses. On his left, in the broad-brimmed hat, Berta Lacerda. (Photograph: Laboratório de Fonética e Fonologia da Faculdade de Letras de Lisboa)
Figure 5. Photograph of Giulio Panconcelli-Calzia, who supervised Armando de Lacerda's work at the University of Hamburg in 1930 and 1931. (Photograph: Museu da Ciência da Universidade de Coimbra)

Figure 6. Paul Menzerath, signed portrait (1933), which Armando de Lacerda kept all his life at his home. (Photograph: Arquivo Familiar Paulo de Lacerda)
Figure 7. The Coimbra Phonetics Laboratory in the mid-1950s. From left to right: Berta Lacerda, John Parker (?), Armando de Lacerda and Sue Nogueira. Nogueira’s participation at the Lacerda 120 – 5th International Workshop on the History of Speech Communication Research provided her with the opportunity to describe her experience in Coimbra approximately 70 years ago. (Photograph: Arquivo Familiar Paulo de Lacerda)

Figure 8. Fieldwork in the Alentejo region in 1955. From left to right: Mr. Miranda (driver), Armando de Lacerda, Berta Lacerda and Peter Strevens. (Photograph: Biblioteca do Laboratório de Fonética. Faculdade de Letras de Coimbra)
**Figure 9.** Photograph of an Alentejo farm worker whose speech was recorded by Armando de Lacerda and collaborators in the early 1950s with the aim of creating a Sound Archive of Portuguese regional dialects. (Photograph: Biblioteca do Laboratório de Fonética. Faculdade de Letras de Coimbra)

**Figure 10.** Armando de Lacerda lecturing at Queens College of the City University of New York, in 1965. (Photograph: Arquivo Familiar Paulo de Lacerda)
**Admonition**

The working out and setting up of a Portuguese phonological system has hitherto been a thankless task for this reason: there is no generally accepted phonetic standard to which one might refer. Generative (morpho)phonemics, however, enables one to admit one system of underlying units for several diastratic, diachronic, diatopic and/or diaphasic function codes of the 'same language', whereas these different codes are generated by different phonological rules. This possibility has given me a reason for reviewing, among other things, studies in the field of Portuguese nasal vowels. These words should not be misinterpreted as a confession of faith. They are simply the statement of what appears to me to be a reasonable starting point for further research.

*This article is based on an investigation that has been made possible by a DAAD scholarship (No. 422 021 002 9) in the years 1968–70. I had talked about the subject with Prof. Armando de Lacerda and Prof. Brian F. Head. Finally, Prof. Georg Heike stimulated me to write an M.A. thesis on it. The present contribution is a systematic presentation of the material rather than a report of the studies undertaken for the unpublished thesis (Die portugiesischen Nasalvokale. Versuch einer phonetisch-phonologischen Untersuchung. Philipps-Universität, Marburg, 1971).


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**Figure 11.** The exhibition features part of Armando de Lacerda's library. The image shows a paper by António Almeida dedicated to Lacerda: "To my mentor and friend Prof. Armando de Lacerda, to whom I will always be grateful. This is my first published work, my first venture alone in the field of science in which you trained me. From your disciple and friend, António Fernando". (Photograph: Arquivo Familiar Paulo de Lacerda)
Figure 12. First exhibition display showing scenes from the 1st and 3rd International Congress of Phonetic Sciences. (Photograph: Francisco de Lacerda)

Figure 13. Polychromograph (left) and four devices that formed part of the chromograph (right) used at the Coimbra Phonetics Laboratory. In the early 1930s, there was a need for a device enabling the confirmation of the mutual influence of contiguous sounds on each other in spoken discourse. Lacerda’s response was to invent the oral labiograph inscriber and the polychromograph, the first devices allowing for the recording of the reciprocal effects of sequential sounds on speech. (Photograph: Quintino Lopes)
Figure 14. Instruments used at the Coimbra Phonetics Laboratory. From left to right: part of a chromograph; a pitch measuring apparatus; a sound-to-light configurations translator; and a shelf for discs. Behind the instruments there are photographs from the 1930's and 40's of the devices in use at the laboratory. A pedagogical instrument, the sound-to-light configurations translator was referred to by Armando de Lacerda in 1953 in the following terms: “These translators are very useful on phonetics courses for foreigners, enabling the translation of the essential conjugations of tone and quality that occur in a given language, provided that the appropriate research has already been carried out, as is the case with Portuguese. By using a translator, a student is able to rapidly acquire a knowledge of structures and expressions, which are designated by accents, intonation, and so on” [5: 39]. (Photograph: Quintino Lopes)

Figure 15. Polychromograph in its current state. It was first used in 1932 and 1933 in Bonn, and it was used at the Coimbra Phonetics Laboratory from 1936. The instrument had a mouthpiece and recorded speech sounds and mouth movements on a strip of paper with a fine jet of ink, thus resolving the problem of stylus friction with the kymograph. (Photograph: Francisco de Lacerda)
Figure 16. Francisco de Lacerda and the chromograph used at the Coimbra Phonetics Laboratory. The chromograph used a very fine nozzle of glass to create a very fine jet of ink that would solidify into a fine line when it hit the moving target surface. Armando de Lacerda developed three methods of deflecting this jet. One was direct vibration from the “tambour registrateur” – this avoided all friction and the influence of the weight of the lever; another was sideways blowing on the jet (the most direct influence without electronic amplification), and the third was electromagnetic vibration of the nozzle. The electromagnetic solution meant that amplifiers were involved. This was the method used with the chromograph, which can be seen in the photograph. (Photograph: Renato Roque)

Figure 17. Detail of a chromograph in its current state, which was used at the Coimbra Phonetics Laboratory. (Photograph: Francisco de Lacerda)
Figure 18. Exhibition hall displaying Coimbra Phonetics Laboratory instruments. From left to right: Rebekka Puderbaugh, Ruediger Hoffmann, Paulo Lacerda, Teresa Lacerda, Bernd Moebius, Jürgen Trouvain, Raphael Werner, Pavel Šturm, Rudolph Sock and Colina Bruijn. (Photograph: Renato Roque)

Figure 19. Another view of the Coimbra Phonetics Laboratory instruments exhibition hall. From left to right, those identified are Rudolph Sock, Colina Bruijn, Marta Lourenço, Angelika Braun, Paulo Ferraz de Lacerda, Fátima Nunes and Quintino Lopes. (Photograph: Francisco de Lacerda)
Figure 20. António Almeida, keynote speaker at the workshop, being interviewed by Isabel Meira of Radio Antena 2 during his visit to the exhibition. (Photograph: Francisco de Lacerda)

Figure 21. António Almeida (right) and Paulo Lacerda. Behind Lacerda is a photograph of António Almeida taken in 1968 at the German Linguistic Atlas Section at the University of Marburg. (Photograph: Renato Roque)
Figure 22. Communications room, which formed part of the exhibition, displaying photographs and documentation portraying the academic life of Armando de Lacerda. (Photograph: Renato Roque)

Figure 23. In 2020, Marika Hammarström kindly donated to the Paulo de Lacerda Family Archive an important part of the archive of her father, Göran Hammarström, who regarded Armando de Lacerda as his mentor in the field of phonetics. In the image Marika is consulting the archive during the opening stage of the exhibition. (Photograph: Renato Roque)
Figure 24. Angelika Braun consulting the Paulo de Lacerda Family Archive. (Photograph: Francisco de Lacerda)

Figure 25. Others who either presented papers at or attended Lacerda 120 – 5th International Workshop on the History of Speech Communication Research, consulting the Paulo de Lacerda Family Archive. In the foreground, Ruediger Hoffmann on the left, and Pavel Šturm on the right. (Photograph: Renato Roque)
Figure 26. Zoom link to Ukraine during a visit to the exhibition for the presentation of the project entitled “Sharing European Histories”, which helps young people understand the complexity and multiplicity of European history. On the computer screen, Irina Kostyuk, the project mentor, is being introduced by Elisabete Pereira, promoter of the strategy “Using object biographies to reveal how our pasts are interconnected”, including that of the “Lacerda polychromograph”. A range of pedagogical strategies employed during the project are presented in twelve languages: Albanian, German, Armenian, Spanish, Greek, English, Italian, Polish, Portuguese, Serbian, Turkish and Ukrainian. In the photograph, on the right facing back is Frens Dols. (Photograph: Francisco de Lacerda)

Figure 27. A break during the exhibition and workshop in the garden of Ferraz de Lacerda, Lda. From left to right, those identified are Raphael Werner, Jürgen Trouvain, Pavel Šturm, Ivan Yuen, Antônio Almeida, Ruediger Hoffmann and Angelika Braun. (Photograph: Bernd Moebius)
Figure 28. Workshop poster.