

# HUGO BAPTISTA RIBEIRO (1910–1988)

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## HUGO RIBEIRO

Hugo Baptista Ribeiro was a distinguished portuguese mathematician who made part of the *Geração de 40*, a generation of mathematicians which was responsible for renewal of Mathematics in Portugal in the decade 1936–1945. Members of this group were Bento de Jesus Caraça, Ruy Luis Gomes, António Aniceto Monteiro, Manuel Zaluar Nunes and others.<sup>[1]</sup> The activities of this group included the foundation of the Portuguese Mathematical Society (*Sociedade Portuguesa de Matemática*, SPM) in

1940 and the publication of the journal *Portugaliae Mathematica* which succeeded to gain international recognition. Playing an important role in the promotion of modern Mathematics in Portugal, Hugo Ribeiro, however, spent his entire career as professor in the United States. The political circumstances allowed him to return to Portugal only after the revolution in 1974. He still lectured as retired professor at the University of Porto.

Hugo Ribeiro was born on May 16, 1910 in Lisbon. He graduated at the University of Lisbon in 1939. He obtained his PhD at the Swiss Federal Institute of Technology

[1] For a more detailed history of the *Geração de 40* see [5].

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**Figure 1.** Front page of the first volume of *Portugaliae Mathematica*.

(ETH) in Zurich, Switzerland. In 1944 he won the *Artur Malheiros* prize for Mathematics of the Lisbon Academy of Sciences. In 1947, however, the Salazar regime interfered at the universities with the result that most of the colleagues from the *Geração de 40* resigned or were expelled from their universities [5, p. 94], and Ribeiro emigrated to the United States. After three years as lecturer and instructor in Berkeley, he was appointed as associate professor of Mathematics at the University of Nebraska in Lincoln, and promoted to full professor in 1953. In 1961 he moved to Pennsylvania State University and he retired in 1975. Only then he returned to Portugal. On February 26, 1988 he passed away in Bicesse (Cascais).

The mathematical work of Hugo Ribeiro is described in a paper by Jorge Almeida [1]. Starting with research in Topology during his graduate times, Lattice Theory was the topic of his PhD thesis in Zurich, supervised by

Paul Bernays. He also used Lattice Theory for a work on the foundation of Probability Theory which earned him the award of the Lisbon Academy of Sciences. In Berkeley, he joined the seminar of Alfred Tarski and started his work in Model Theory, and his subsequent research could probably be subsumed best under the topic of Universal Algebra.

In the following, we will highlight two aspects of Hugo Ribeiro's personality: his engagement in the development of Mathematics in Portugal, and his interaction in a large international network of mathematicians, which included, in particular, his support for mathematicians — from Portugal and elsewhere — in the academic world.

### PORTUGUESE MATHEMATICS

In 1937 members of the mentioned *Geração de 40* founded the journal *Portugaliae Mathematica* as a publication specialized in Mathematics [5, §4.1]. It provided a forum to publish work of portuguese mathematicians, but also to attract international scientists. The first editor was António Monteiro, but Hugo Ribeiro was mentioned on the front page of the first volume as collaborator along with José da Silva Paulo and Manuel Zaluar Nunes.

The journal was a great success. It published 87 papers with 1377 pages in total between 1937 and 1946. Hugo Ribeiro was contributing 5 papers as single author and more three with co-authors. But among the 36 authors of this decade, 23 were foreigners, including the names of John von Neumann, Maurice Fréchet and Heinz Hopf. In fact, the international recognition secured the survival of the journal even after several of the editors were excluded from portuguese university careers. After Monteiro emigrated to Brazil, Zaluar Nunes took over the position as managing editor, but Monteiro and Ribeiro continued contributing to the development of the journal from abroad. From the perspective of the ruling regime, the international scientific recognition which Portugal was gaining from the journal was probably more important than excluding further the exiled mathematicians. In consequence, *Portugaliae Mathematica* developed into the flagship of Portuguese Mathematics, withstanding the times of the dictatorship, and still today it is an established international journal in Mathematics.

Hugo Ribeiro was also one of the founding members

As nossas primeiras tarefas

Devemos tomar, a maior eficiência possível, contacto com problemas vivos da Matemática de hoje e atacar a sua resolução. Esta é a única maneira ~~de~~ de percebermos desde já, o "valor" da nossa actual "cultura" livreira e de automatismos. É, isto, junto a uma aturada revisão dos nossos conhecimentos, desde os elementos, permitim-nos-ê ir lutando as nossas antigas visões ao trabalho e ganhando confiança nos resultados futuros. No Jê, cada um de nós, tem um esforço suplementar a fazer. Temos que conseguir nós próprios o impulso inicial.

O trabalho tem de ser, quanto possível, junto de matemáticos experimentados, num ambiente onde os problemas se vivem dia a dia e onde a técnica própria do estudo se observa, se adquire, é, pode dizer-se um indelével objetivo a atingir, desde o início.

No nosso país é difícil encontrar esse ambiente - os nossos matemáticos experimentados são em número reduzido. É urgente procurar frequermente os centros de estudo estrangeiros e fazer isto em grande escala, em massa, conseguindo pelas mais joveas pelas menos vicissitudes das nossas salu-dades. É preciso lutar, militar, a favor desta ideia antes do mais. (Aquí realce entre ponto em que considero expostas as minhas propostas à S.P.M. Mas, enquanto para cada estudioso tal aspiração não for realizavel, ele deve aproveitar e procurar todas as oportunidades para trabalhar em contacto co\_m os centros e os matemáticos isolados, que se encontram no nosso país. Actualmente (seria escusado dizê-lo) é o Centro de Estudos Matemáticos do Porto, cuja admiravel actividade é conhecida, o ambiente que no país devemos considerar mais aconselhavel. Os restantes professores provavelmente preterem a ensinar em estudos propriamente matemáticos é fácil encontra-los, pois os problemas de que se têm ocupado são normal-mente arquivados na Portugaliae Mathematica. Outros auxiliares dos que

**Figure 2.** Beginning of a typescript with tasks to modernize Mathematics in Portugal.

of the Portuguese Mathematical Society (*Sociedade Portuguesa de Matemática*, SPM). The inaugural meeting took place on December 12, 1940 at the Faculty of Science of the University of Lisbon. While the Society was quite active at the beginning, it was not well received by the regime and it was not officially recognized. When, in 1946 and 1947, the suppression of the portuguese universities increased and most of the mathematicians had to leave their positions, the SPM practically stopped operating and it was only possible to continue the publications *Portugaliae Mathematica* and the *Gazeta de Matemática*.<sup>[2]</sup>

Ribeiro took active part in initiatives to modernize Mathematics and Mathematical Education in Portugal.

<sup>[2]</sup> See the information at <https://www.spm.pt/spm/historia/>.

<sup>[3]</sup> See <https://www.math.wustl.edu/schaerf.html>.

These efforts were cut short when he had to leave Portugal in 1947 after the interference of the government. While Mathematics in Portugal entered in decline, Ribeiro was following the situation from abroad and, consequently, was available to help reconstructing it after the revolution in 1974.

## ZURICH

For his PhD, Hugo Ribeiro was planning to go abroad. He had established, via John von Neumann, contact with Princeton and received a formal letter of acceptance on October 17, 1941. In parallel he applied for a grant from the Institute for High Culture (*Instituto para a Alta Cultura*, IAC) to support his stay abroad. Apparently, the support was already granted, but when the United States were dragged into World War II by the attack on Pearl Harbor in December 7, 1941, the Portuguese government suspended the application of the grant. In consequence, Ribeiro asked to go to Paris, and if that would not be allowed, to go to Zurich. While in April 1942, Paris was approved, four months later, the IAC changed the destination to Zurich, in Switzerland. He arrived there on September 30, 1942.

The stay in Zurich did not only result in Ribeiro's PhD [4], but it also extended his scientific network. Heinz Hopf's contribution in *Portugaliae Mathematica* in 1944 was clearly arranged by personal contact with Hugo Ribeiro. For his later life, the acquaintance with Henryk Schärf was to turn out crucial. Schärf, who had specialized in Actuarial Science,<sup>[3]</sup> had escaped to Zurich from Poland after the German occupation of his home country.

Through his supervisor Paul Bernays, Hugo Ribeiro came in contact with Alonzo Church, the founder of the *Journal of Symbolic Logic* (JSL). Church put a great effort in reviewing the published literature in logic, and Ribeiro wrote in sum 21 reviews for the JSL, in particular about papers in Romance languages. In 1944, when the postal service from the United States to Switzerland was interrupted, Church used Lisbon as a hub, and asked Ribeiro





**Figure 3.** Mario Dolcher, Paul Bernays, Maria Pilar, and Hugo Ribeiro in front of the ETH in Zurich in the 1940s.

to pass papers to Bernays in Zurich. Still in September 1945 postal services to Switzerland were not restored and Church again asked Ribeiro to pass mail to Bernays via Portugal.

#### UNITED STATES

After returning to Portugal, it became soon clear that the political circumstances would not allow for a further career of Hugo Ribeiro in Portugal. It was at this moment, April 1947, that Schärff, who had already established himself in the United States, wrote to Ribeiro to consider to send applications to Harvard, Princeton and the University of California in Berkeley. With help of a recommendation of Schärff he obtained a lecturship in Berkeley, and soon joined the logic seminar of Tarski.

His first permanent position was at the University of Nebraska in Lincoln. There is a letter preserved from a 16 years old high school student of Omaha, who thanks Ri-

beiro as the only one who replied to him when searching for mathematical literature. This student was Saul Kripke, a nowadays famous logician who made his appearance in the scientific world when he published a semantics for modal logic at the age of 18. It is likely that this work had profited from the help Kripke received from Ribeiro.

In 1961 he was appointed full professor at Pennsylvania State University, a university of highest reputation where he had, for instance, Haskell Curry as another logician at his side.

#### COLLEAGUES AND STUDENTS

The *Geração de 40* was, to a large extent, forced to leave Portugal, but their members managed to keep contact and to maintain a successful network — especially by the continuation of *Portugaliae Mathematica*. Hugo Ribeiro was not only actively involved in this network,<sup>[4]</sup> but he was also an example of an academic professor who helped

<sup>[4]</sup> See [3].



**Figure 4.** José Morgado and Hugo Ribeiro

colleagues and students when they approached him with all kind of problems. We already mentioned Saul Kripke as a high school student. Ribeiro also helped J. Richard Büchi for his move to the United States in 1949. Büchi was, as Ribeiro, a PhD student of Paul Bernays, and on Bernays' suggestion he published his thesis in *Portugaliae Mathematica*. He became a Professor at Purdue University in Lafayette, Indiana, as expert in Formal Languages, a branch of Mathematical Logic which shaped Theoretical Computer Science.

One can find many other examples in his correspondence. We may only add two students from Portugal who asked him for advice. In the late 1960s, Catarina Kiefe, graduated in Porto, approached him about possibilities to study Mathematical Logic, and subsequently Celestial Mechanics, in the Netherlands or the United States, because it would not be possible to study it in Portugal. A long correspondence started and Kiefe finished a PhD in Mathematics in 1973 at Stony Brook, State University of New York. She went on to obtain a Medical Doctor

at University of California, San Francisco and she works nowadays as professor for Biometrical Research at the University of Massachusetts. Already back in Portugal Hugo Ribeiro also replied to requests of Fernando Ferreira, today full professor for Mathematical Logic at the University of Lisbon, when Ferreira was about to move to Penn State University to study with Stephen Simpson.

#### MARIA DO PILAR RIBEIRO

An appreciation of Hugo Ribeiro would be incomplete without an acknowledgement to his wife, Maria do Pilar Ribeiro (1911–2011).<sup>[5]</sup> Unusual for a woman at that time in Portugal, she studied Mathematics at University of Lisbon and finished her *licenciatura* in 1933, when she also got married with Hugo Ribeiro. She accompanied her husband to Switzerland and to the United States, but kept her mathematical activities. Before the move to Switzerland, she was working as a high school teacher

<sup>[5]</sup> See the information at [https://www.spm.pt/maria\\_pilar\\_ribeiro/](https://www.spm.pt/maria_pilar_ribeiro/).



**Figure 4.** Maria Pilar and Hugo Ribeiro at Penn State (around 1970).

in Lisbon. At Penn State she was also lecturer for Mathematics, and after the return to Portugal she was lecturing at the University of Porto.

In 1951, together with José da Silva Paulo, she translated into portuguese the famous book *Grundlagen der Geometrie* of David Hilbert [2]. She was also engaged in Hugo Ribeiro's translation of van der Waerden's *Moderne Algebra* [6]. She corresponded with van der Waerden in the late 1940s about the unclear copyright situation as the victorious powers had nullified the copyright of German publishing houses.

She was one of the founding members of the Portuguese Mathematical Society and served as *first secretary* (i.e., vice secretary) of the Society in 1941/1942 and 1946/1947. At the time of the legal registration of the Society in 1977, Maria Pilar was registered as *member n<sup>o</sup> 1*.

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