

The Emperor's Heart

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Dear Editor

Revolutionary movements forced D. João VI to return to Portugal. In doing so, all the wealth contained in the Brazilian safes was carried back to Portugal, by the royal family. After the return of D. João VI to Portugal, Brazil, which had been promoted to the “United Kingdom of Portugal”, should return to being a Portuguese colony. However, opinions were divided regarding the return of D. João VI's son, D. Pedro de Alcântara, aged 23 at the time, the regent D. Pedro I (Caldeira *et al.*, 1997).

The parliament in Lisbon then issued decrees to reduce the power of Brazil's regent and make Brazil directly subordinate to Portugal. Residents of Rio de Janeiro organized a petition with more than 8 thousand signatures demanding that D. Pedro I not leave Brazil. These events culminated in the “Dia do Fico” (“I stay day”) that marked the adherence of D. Pedro I to the demands of the Brazilian elites. Thus, monarchy and slavery would be preserved.

Therefore, on September 7, 1822, 200 years ago, on a trip when D. Pedro I was returning from Santos to São Paulo, on the banks of the Ipiranga river, he received from an emissary, a letter containing a decree from Portugal that would reduce him to the simple governor of Brazil. He then decided to crumple up the documents and set a landmark date for Brazilians. Two hundred years ago, D. Pedro I proclaimed Brazil's independence from Portugal and became the emperor of Brazil, by shouting the iconic expression: “Independence or death” (Novaes; Lobo, 1997). In the following years, the young Brazilian nation quelled insurrections and gained more autonomy, having been recognized as an independent nation by Portugal in 1825.

After abdicating his throne in 1831, D. Pedro I returned to Europe in the following year, where he entered into a fratricidal struggle against D. Miguel in order to support the reign of his eldest daughter, Maria da Glória. In that war, the city of Porto was crucial for D. Pedro to resist the siege of his younger brother's army and, thus, guarantee the victory of the monarchy. For this reason, the former Brazilian emperor is also celebrated in Portugal as D. Pedro IV, the “Liberator”.

Before dying in 1834 due to tuberculosis, which he had contracted at the age of 35, he ordered that his heart should be removed and left in the city that

had welcomed him. His body was sent to Brazil in 1972, on the occasion of the celebration of 150 years of independence. Since then, Dom Pedro's heart has been in a glass with a fixative solution located in the “Irmandade de Nossa Senhora da Lapa” church, in Porto, locked in a wooden urn under the protection of five keys, and is rarely exposed to the public.

In the celebrations in September of this year (2022), an agreement between the Brazilian and Portuguese governments allowed the heart of D. Pedro to be presented to the Brazilian people. This fact generated controversy among the Portuguese because, despite having been approved by the Legal Medical Institute of the University of Porto and by the City Council of the same city, many feared that the body would degrade during air transport. Interestingly, we are talking about a 187-year-old heart that's been soaked in a mysterious fixative solution. After all, formaldehyde would only be synthesized from methanol by the German chemist August Wilhelm von Hoffman in 1867, and Ferdinand Blum had not even tested and used the diluted substance for disinfection and biological fixation in subsequent years (Fox *et al.*, 1985).

It is believed that the solution that preserves the heart of D. Pedro I contains a mixture of substances extracted from wine, the so-called spirit of wine, in addition to formaldehyde itself, which was possibly added later. Unfortunately, there is not much information about the composition of this mixture.

In fact, the use of different substances aiming at the conservation of biological structures is not uncommon throughout history. Richard I, a legendary English king better known as “lionheart” and who died in 1199 AD, had his heart extracted and embalmed in the church of Notre Dame in Rouen based on biblical scriptures. A 2013 study identified that this organ was wrapped in linen and mixed with myrtle, daisy, mint, incense, creosote, mercury, and even lemon juice. Such substances would preserve the tissue and maintain a more pleasant odor, similar to the odor of Christ (Charlier *et al.*, 2013). This is a procedure different from that used by the ancient Egyptians or on mummies from other civilizations, whose balm contained mainly fats, beeswax, and diterpene resins, in addition to castor oil and mastic triterpene resin in some situations (Tchapla *et al.*, 2004).

It is to be imagined that the mixture of substances used to preserve D. Pedro's heart caused some alterations in the organ. In fact, it has a more ovoid and swollen appearance, which has already raised doubts about its veracity and whether there was any associated disease in the organ. Visually, the organ does not appear darkened, something that is quite common when fixation occurs through substances such as formaldehyde and glycerin, for example, for a long time.

Perhaps a way of lastingly preserving the heart of D. Pedro, a relic for Portugal and Brazil, is some kind of primordial plastination. However, the technique, as well as the manipulation of the organ itself, could cause retraction and change the cardiac structure. Therefore, studies on the composition of the balm and analysis of the feasibility of the technique for an organ that is almost 190 years old must be carefully considered.

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Mini Curriculum and Author's Contribution

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