

WILL WE STOP AT NOTHING?

Roald Hoffmann



When it comes to the popularization of science, you already know the answer for some of us. This is a story of a most unusual intersection of science and popular culture in Brazil, in which I was fortunate enough to play a tiny part. It is also a personal picture book.

The Carnival of Carnivals

Rio de Janeiro's Carnival is days of raucous celebration before Lent. The highlight is a ritualized competition between neighborhood-based "samba schools" that spend a whole year and a multi-million-dollar budget preparing for a gargantuan, one-time musical production. Massed 3,000–5,000 strong, the vividly plumed members of the school dance through the *Sambódromo*, an 800-meter-long coliseum devoted to just this purpose. Each group parades for 90 minutes in a choreographed fusion of story, song, dance and

dress, tied together by a theme, punctuated with floats, animated by the thunder and syncopated variety of the *bateria* ("drum corps" is an impoverished translation). Sambaing down the central *avenida*, the cultural fault lines between *favelas* (shantytowns) and affluent districts are momentarily forgotten. All dancers dress in costumes called *fantasias*, coordinated with the theme and the floats, and sing at the top of their voices the thematic samba of the school, the *samba de enredo*. Fourteen schools compete in the top league; the lowest-ranking can be demoted to the minors.

A Carnavalesque Collaboration

I know you are wondering where the science comes in. Well, in 2003, a talented young *carnavalesco* (the designer of a carnival parade; yes that's a profession in Brazil) named Paulo Barros proposed to one of the less affluent samba schools, the Unidos da Tijuca, a science theme for the February 22, 2004 parade. No one had gone down this road before—typical Carnival themes are Amazonia, African or Portuguese heritage, sex, the sea, television stars *et cetera*.

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At right, Paulo Barros, the carnavalesco for Unidos da Tijuca, supervises the construction of the float on the facing page. Two of his designs for fantasias are shown above—Dolly the cloned sheep and DNA. I didn't get to wear either. (Except where noted, all photographs are courtesy of Casa da Ciência at the Universidade Federal do Rio de Janeiro.)



Unidos da Tijuca agreed to the plan, and began preparing for “The Dream of Creation and the Creation of the Dream: Art and Science in the Age of the Impossible.”

Paulo Barros then approached the science-outreach group, called Casa da Ciência, at the Universidade Federal do Rio de Janeiro (UFRJ). The enthusiastic Casa da Ciência crowd loved the idea, and worked with the samba school for a year to get ready. The results showed, from the words of the theme samba to the costumes.

So What Was Roald Doing There?

The vast majority of Brazilian scientists, even some who usually left town during Carnival, were supportive of this incredible opportunity for science to interact with popular culture. The United States equivalent might be a science-themed halftime show at the Super Bowl.

Yet Barros's show was assuredly carnivalesque—not only in its traditional suspension of everyday prohibitions, but also in Bakhtin's sense, in its mocking of authority. In some instances, scientific authority was the butt of the joke: The parade included floats and dancers that played to the worst stereotypes, such as a troop of Frankenstein's monsters and a bevy of reanimated mummies.



The sketch below shows the design for the first float in the procession, a Time Machine. Some of the clocks are going forward, some back. At left, “Albert Einstein” drives the float in the real parade, preceded by one of the dancers.





Is this science? From left to right, Dr. Frankenstein's creatures on the Energy float, sambaing mummies and the only number-bespangled bateria in the world.

A month before the festival, the press found a critic who said what you'd expect—that there was a real risk of reinforcing misguided stereotypes in the floats. At the same time, some Carnival mavens were criticizing the Unidos da Tijuca for their choice of a "difficult" theme. I suspect that the Casa da Ciência people sat down for a strategy session and decided that it might help if a well-known scientist from outside the country would give them needed support. Richard Feynman, who played in a bateria 50 years ago, was unavailable, having died in 1988. I can imagine one of them saying "Who would be crazy enough to do this?" And my friend Antonio Carlos Pavão from Recife probably said "I know, Roald!"

So they asked me, three weeks before Carnival. As you can tell from the sleek blue denizens

of one of the floats (and these are the tame images), Unidos da Tijuca didn't want me for my body. Not for my mind either. True, I thought that the shapes around the bottom of the alchemy and chemistry float were atomic orbitals (the subjects of my research), but they were pills.

The samba school wanted me for the publicity I would generate and the good things I would say about the science in the parade. I knew that, and it was fine—I agreed to be used for a good purpose. And I would be in Carnival: The other scientists and I were all dressed as Alberto Santos-Dumont. Santos-Dumont was the revered Brazilian aviator who, in Paris, pioneered dirigible airships and lay claim to the first sustained, heavier-than-air flight (his biography was reviewed in *American Scientist*, September–October 2003). The asser-



Here is Barros's design for the Santos-Dumont fantasia, and here I am getting dressed in the final version. The Parisian dandy's chapeau has somehow evolved into a gaúcho hat. The outfit—balloons, wings and all—weighed about 15 pounds. (The photograph above is one of mine.)



A group of us, including Marcelo Gleiser from Dartmouth, waits for our turn. Cold beer helped with the humid Brazilian summer, but the real high (and some good exercise) came from dancing down the avenida for an hour and a half. The picture that made the Brazilian papers is shown at left. (The photograph above is courtesy of Antonio Carlos Pavão.)

tion is arguable—everywhere except the U.S., of course, which unconditionally deifies the Wright brothers. The costuming choice made for good newspaper questions for me, the American.

And the Winner Is...

The star of the parade was one of Barros's floats called *Criação da Vida*, or Creation of Life. One hundred twenty-three young people, spray-painted blue-black, were strapped onto this pyramid, and they performed a spectacular choreographed dance as it moved through the Sambódromo. At times their arms and bodies evoked the helices of DNA and proteins; at times they just celebrated life.



*Two snapshots of Paulo Barros's show-stealing celebration of life, the *Criação da Vida*, a pyramid of 123 young dancers.*

To the surprise of the Carnival, Unidos da Tijuca won second place. It had never ranked higher than fifth in the top league. Much of the credit goes to Paulo Barros's theme and the Casa da Ciência's efforts. Science will be back at Carnival in the years to come.

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