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DEPARTMENT FOR ECONOMIC DEVELOPMENT, SCIENCE  
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SÃO PAULO STATE GOVERNMENT

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# LETTER FROM THE EDITOR

## Water, math and neglected diseases

**Alexandra Ozorio de Almeida**

EDITOR IN CHIEF

**W**e are pleased to present this special issue of *Pesquisa FAPESP* in English. This edition is composed of a selection of reports that were originally published in the Portuguese version of our monthly magazine between September 2014 and February 2015 (issues 223 to 228).

The lead article (p. 6) discusses the water shortage that currently affects southeastern Brazil, which is an increasingly global problem. Research shows the role of the Amazon in creating a ‘vertical river’ that extracts water from the Atlantic Ocean and the soil, feeding the clouds and helping to change the direction of the winds that circulate water across South America. Research from the INPE (National Institute for Space Research) shows a different circulation pattern that deviates from the predicted weather pattern. Deforestation adds to the complexity of this problem, altering pressure patterns and possibly causing a decline in the moisture-laden winds that blow from the ocean to the continent.

This edition offers a profile of the mathematician Artur Ávila (p. 14), the first Brazilian and the first South American to receive the Fields Medal, the most prestigious award in mathematics. A specialist in dynamical systems, Ávila is based at the IMPA (Institute for Pure and Applied Mathematics) in Rio de Janeiro and the CNRS (National Center for Scientific Research) in Paris. This carioca shared the award with three other winners, one of whom is the first woman to receive this honor.



Currents of water vapor that form over the Amazon rain forest export rains to southern Brazil

In the interview featured here, Ávila explains his working process. Reading books and papers are not a priority for him; he prefers to work in collaboration with other researchers who are specialists in certain areas of interest. He learns what is most important from them and applies this knowledge toward tackling the given problem that he is trying to solve.

Potential cooperation in the development and delivery of new treatments for neglected diseases such as Chagas disease, visceral leishmaniasis, malaria and sleeping sickness was discussed at the FAPESP headquarters in November 2014 (p. 26). In addition to FAPESP, the other participants were the Royal Society of Chemistry of the United Kingdom and international organizations, such as the Drugs for Neglected Diseases initiative and the Medicines for Malaria Venture. Among the conclusions of the meeting were that Brazil has a great deal to offer in finding new drugs, in areas such as organic chemistry and molecular biology. However, a considerable effort is still necessary to build

connections between research groups and to create incentives for international collaboration in this area in Brazil.

On the subject of neglected diseases, Pesquisa FAPESP pays homage to the memory of a great scientist, Luiz Hildebrando Pereira da Silva, one of the most respected parasitologists specialized in tropical medicine worldwide (p. 40). Luiz Hildebrando, as he was known, spent most of his career at the Pasteur Institute in Paris as a political exile, where he conducted important research on the molecular biology of malaria. After retiring from the Pasteur Institute in 1996, he returned to Brazil and continued to manage research programs in the Amazon, where he was also successful in reducing the number of malaria cases in the region. Luiz Hildebrando passed away in September of 2014, at the age of 86, having lived a full life that was dedicated to science and to improving the well-being of humankind.

Various other features can also be found in this issue. Enjoy!