MARIA VON PAUMGARTTEN DEANE

IN MEMORIAM

Translated from a talk given by Luis Hildebrando Pereira da Silva at the
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Entrusted by Erney Camargo with the most difficult task of saying a few words about recently departed Maria Deane, my first thought was to ask for an up-to-date copy of her *curriculum vitae* from her close colleagues and collaborators at the Oswaldo Cruz Institute, the obvious attempt to prepare the necessary data, the elaboration of the traditional funeral speeches in honor of great personalities, the chronology from birth to death, passing through first communion, sweethearts and marriage, graduations, titles and diplomas, professional responsibilities, positions and duties, scientific successes, great and small discoveries, prizes and decorations; personal, family, academic, national and international recognition. I was advised, to my surprise, that Maria didn't have a CV. The surprise lasted only for a short time. I realized immediately that this was what I had expected. Maria was never very worried about this kind of problem, leaving documents or proofs, unlike those who are essentially interested in their future survival. She was interested in the present, or more precisely, in the problem at hand. Nevertheless she should have a CV - like everyone else - because Maria, as we all know, crossed all these dates, and from one side, by all these glorious phases of a very successful career and also from the other, by all dificulties, disillusions and problems, that each one of us, mortal researchers, face in our daily lives. It's much better not to find Maria's CV; in that way, I will try to spontaneously reconstruct without benefit of notes, that which, from her view was most noteworthy during our long relationship, that dates back more than 40 years.

It was at the beginning of the 50's that I met her, at the time Samuel Pessoa invited her to join, together with Leonidas, the teaching staff of USP's Parasitology Department, where I was at the time in training as a medical student. Obviously I knew the famous "Deanes", their studies on leishmaniasis and on the vector of malaria in the Brazilian Northeast region and Amazônia, and for me, a young novice, they represented accomplished and famous scientists.

In general, when one speaks of Maria, one has the habit to refer to her as part of a whole that we called "the Deanes". In truth it was from the time of my personal contact with "the Deanes" that I began to progressively realize that one was quite different from the other, even though "the Deanes" worked together since the 30's in Pará with Evandro Chagas. They were always very different individuals frequently and intensively collaborating, it's true, in the sense of perfectly complementing each other, while each kept his individual traits. Leonidas was always the learned and modest scientist, rational, anxious over the tentatives to integrate knowledge and to design coherent explanatory charts of problems and of situations. He was, without doubt, the great figure of our generation in Brazilian Parasitology in its epidemiologic aspect.

Maria, on the other hand, didn't look for either coherency or the harmonious integration of knowledge, rather she was interested in paradox,

in the disturbing problem, in the unexpected. The rebel scientist; it was not by accident that she firstly described *Manzonela ozzardi* in America and antecipated the existence of Onchocerca. It also wasn't by chance that she complemented the discovery (this with Leonidas who knew the Wenyon by heart, naturally) of the only *Plasmodium* from chiropteros (bats) - *Glossophaga soricina* - described in the American continent, renamed by Garnham as *Polychromatophylus deanei*. Such discovery, which generally leaves the modern scientific public indifferent, specially the molecular biologists, was in Maria's mind of great evolutionary significance, and it trully is, because in the American continent, as you know (or at least should), there are no plasmodia among forest rodents as in Africa.This can be explained by the continental drift some 30-40 million years ago. This casts a doubt on whether the plamodia from non-human primates - brazilianum and simium - are native or derived from human parasites (*malariae* and *vivax*) brought from Africa during the slave trade.

Now, what is this *Polychromatophylus deanei*, a true missing link, doing in the middle of this local desert of Apicomplexa? This was exactly the kind of problem that Maria would love, that made her give her hoarse, irritating, sardonic little laugh of an inverterate smoker. After hearing that laugh, followed invariably by a clearing of the throat and by an intonation of the voice for the commentary or the question, one got ready:

- Hey man, how do you explain it? What's going on with the *Polychormatophylus*?

- Who knows Maria, some bat that flew into the hole of a slave ship and showed up in Amazonas.

Another laugh, followed by a puff of cigarette smoke and the checkmate remark:

- You think so? Then explain to me how it is that no more bats of the *Glossophaga soricina* species or similar were found near Africa, nor even plasmodia from the *Polychromatophylus deanei* were encountered in other species of African bats. How is it then? The last *Glossophaga soricina*, that just happened to be infected, decided to emigrate... Is that how it was?

The last 10 to 15 years of Maria Deane's professional life were, I suppose, the most comforting and agreable moments of her life as a researcher. The torment of the 60's and 70's had passed, when due to the military dictatorship and political persecution "the Deanes" had their personal and professional lives entirely disturbed, and then came the calmest period in the 80's. Then, thanks to the serious but cordial, loving, reliable, supportive atmosphere created around them at the Oswaldo Cruz Institute, first by José Rodrigues Coura, and later by Carlos Médicis Morel, "the Deanes" could begin again their activity.

At that time, Maria could dedicate herself to the question of research, which really interested her: the evolutionary biology of parasites. It was in this period that she developed her most interesting work on the evolution of *Trypanosoma cruzi*, the possible existence of a sexual phenomenon in the evolution cycle. Even more extraordinary was Maria's discovery of the multiplication of *T. cruzi* in the anal glands of the opossum. Only Maria Deane could make such a discovery. On the several occasions in which I came to visit her, during recent years, she got enormous pleasure in speaking about the evolutionary implications of such findings:

- Guess what is this, man? She said to me once, showing an electronic microscopy photograph.

- Who knows, Maria, it looks like a snake nest.

- Ha, ha! What snake's nest, man, this is *Trypa-no-so-ma cru-zi*!!!

- *Trypanosoma cruzi*? That's cake batter.

- It's not cake batter! It's a cyst, a *T. cruzi* cyst. I have been looking in the microscope at the formation of a cyst in the posterior intestine of the "barbeiros".

It's formed by the fusion of two fat epimastigote forms followed by a multiple division similar to schizogony. The phenomenon, however, is irregular, or better yet, I don't know what has caused it. I'm investigating this: fast of the "barbeiro"? Sucking plant juices, sugars? After all something causes sexuality... I don't know yet...

The last time I was with Maria, in March 1995, she was already in an advanced phase of bone cancer that caused her so much suffering and forced her into a wheel chair. She quickly dismissed, however, the subject of sickness from our conversation in order to plunge in her passionate subject of the moment: the evolution of *T. cruzi* in the anal glands of the opossum. She had already spoken to me about this during previous visits.

- It's clear, man. She told me, that the opossum, as an insect eater, must have served as the transitory link between the trypanosomatids parasites of insects and the hemoparasites of mammals. I have already examined several trypanosomatids of insects. Some species of Crithidia survive in the anal glands. Others don't. My hypothesis, said Maria, is that the ancestor or *Trypanosoma cruzi*, an insect parasite, adapted itself to the scent glands which afterwards served as a stepping stone for the following evolutionary efforts: the "evolutionary dream" of this *T. cruzi* ancestor was to leave the backside of the opossum, relatively poor in

nutritive factors and enter the rich blood circulation, rich in nutritive factors. The difficulty in the transition resides in the acquisition of resistance to the immediate effects of the immune system, particularly of complement. Now, Maria further said, in a blood sucking insect, the fresh blood contains complement and can furnish the selective base to pick out mutants of trypanosomatids of the digestive tract. In the remaining years of her life, Maria Deane worked essentially on that problem.

Last time I saw her, she had new information about the heterogenity of *T. cruzi* strain's as regards the capacity to evolve in the anal glands and from there enter the blood stream. We talked a long time about this. From the bus window that took me from her house in Santa Tereza to down town, I saw Maria waving goodbye from her wheel chair in front of the house. She gave a sad smile, perhaps expressing the premonition of the last meeting. The smile, however, faded and rapidly changed into a wrinckled forehead which I immediately recognized: she was once again deep in reflection on the question that tortured her mind at that moment: how did that blood sucker get out of the opossum's backside and lodge in man's heart?

Who knows, Maria. I don't know. It's enough taxing your brain. Take it easy a little. Don't try to give all the answers. Leave some of them for the young. Some day it will be known. The exact procedure is going to be described, with all the metabolic routes that are necessary to adapt; the mutations that lead to the acquisition of thermoresistance, from resistance to the complement and the NK cells. The means to enable it to escape the immune system through the induction of polyclonal activation of T and B lymphocytes in the mammal host, by the production of superantigens and other products leading to the regulation of the immune response and with new regulations of genetic circuits and the necessary functions. When the youth of today clearly understand all of this everyone will know that it was you who cleared the way to understand the mechanisms of parasite adaption, calling attention to basic biological phenomenon. Relax, Maria, and don't worry. The day will come, and it will be due largely to you.