

# Easter Island and Plastic Surgery in the Light of a Historical Study

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*“One of the men with leprosy was a gifted carver, fifty-one-year old Gabriel Hereveri (Fig. 1). He had been confined almost two decades; the disease had claimed both hands and both feet; his face had “caved in” grotesquely; and he was blind in one eye from the damage to his eyelids. The vision of the other eye was headed in the same direction [...] Plastic surgeon Garry Brody studied Gabriel’s eyelid and devised what he now calls a “simple” operation to transplant a part of the temporalis muscle at the side of his head to the eyelid so that Gabriel could open and close his eye in an effort to save his vision. He operated in the tiny theatre of hospital [...] Gjessing and Montandon (who assisted Dr Brody) were still in training; now they both wonder if this operation influenced their choice of plastic surgery.”*

This quotation is borrowed from a book published in 2019 under the title: *Stanley’s Dream. The Medical Expedition to Easter Island*.<sup>1</sup> Its author, Jacalyn Duffin, is a hematologist and historian who held the Hannah Chair of the History of Medicine at Queen’s University from 1988 to 2017. She is best known for her teaching book *History of Medicine: A Scandalously Short Introduction*, which has become a manual for many medical students, and for the publication in 2009 of an extensive research in the Vatican’s library under the title *Medical Miracles: Doctors, Saints and Healing in the Modern World*.

In January 2014, while at the University of British Columbia, searching in the UBC Archives, Dr Duffin explains, in her new book, that she found to her amazement 3 boxes of material labeled “Medical expedition to Easter Island, 1964 to 1965 (METEI),” containing numerous documents and scientific journals, which had been deposited in the 1970s by a certain Ian E. Efford, Professor of Ecology. Further digging into other archives in Ottawa and McGill University as well as on internet, Dr Duffin brought to light that, in 1964 to 1965, Canada led an international, multidisciplinary scientific expedition to Rapa Nui (the local name of Easter Island), in the southeastern Pacific Ocean, which at that time was and still is the world’s most isolated community (Fig. 2). The Medical Expedition to Easter Island had been conceived and directed by surgeon and gastroenterologist Dr Stanley Skoryna of McGill University in Montreal, together with his friend, Dr Georges Nógrády, a bacteriologist at Université de Montréal. They had both immigrated to Canada years before, escaping from communist countries of Eastern Europe, and both were particularly interested by problems of the world such as overpopulation, sustainability, pollution, and the

liability of humans to adapt, resist or be contaminated by international population exchanges. After they had learned that Easter Island was targeted for an airport, they conceived an ambitious research. With a team of scientists, they would first make a medical, ecological, and sociological survey of the Island and its population of 1000, before the airport was achieved. A few years later, the team would return after the airport had opened to repeat the survey and to examine the effects on the islanders and their adaptation to increased contact with tourists and the outside world.

How did they manage to enroll 38 individuals from North American and European countries, among them a few outstanding scientists, Spanish translators, and journalists? How did they obtain a half million dollars credit for transporting the whole team, with 25 prefabricated cabins for construction of a village and laboratories on the island, by a ship from the Canadian Navy and its 150-member crew? How, in spite of multiple divisions inside the scientific team, outburst of social and political claims by the Islanders and many other impediments, all the native inhabitants of the Island were finally examined including medical history-physical examination-blood tests-chest X-rays, dental checkup? How during the stay of the expedition on the island, which lasted less than 2 months (from December 20, 1964 to the February 12, 1965), were thorough studies of the wild and domestic fauna and flora conducted? And why all the results were not analyzed and published? These are, but a few of the questions Dr Duffin tried to formulate, decrypt and extract from hundreds of notes, dairies, articles, films, and books that appeared during the next few years.

Although she thought that most participants to this extraordinary experience would probably be dead 50 years later, she soon discovered that, if the 2 initiators of METEI had died, most of the others were still alive and had pursued active careers in various countries such as Canada, USA, Norway, Sweden, South Africa, Switzerland. Among them, was plastic surgeon Garry Brody, who had spent part of his residency at McGill University, conducting research with Skoryna, and who had been invited to be “assistant director” of METEI by his former colleague. Later, Garry pursued a successful practice in the US. In 1995, he was elected president of the American Society of Plastic and Reconstructive Surgeons. In 2016, he was considered and interviewed as a “legendary plastic surgeon” by his peers.<sup>2</sup> Einar Gjessing had been a medical student in Sweden, mostly interested in sport physiology at the time of the expedition (being himself a cross country athlete). He was engaged as an assistant to the research project of another young athlete and sport physiologist from Sweden, Björn Ekblom. After the completion of his study in Sweden, Einar trained in and practiced plastic surgery in Bergen (Norway). The author of these lines was spending his first year of surgical residency at the Royal Victoria Hospital (McGill University). His incredible luck to be part of METEI’s medical team had undoubtedly been linked to the strong desire of the organizers to add a sociological survey to the research on health and biosphere. Indeed, due to the defection of a distinguished McGill anthropologist, Denys’ young Greek wife, Cleopatra, who had just graduated from the University of Geneva, was a providential solution. The couple was thus added to the scientific team

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FIGURE 1. Moai Kavakava sculpted by G. Hereveri. Exophthalmos, aquiline nose, long ears, protruding chin, and ribs: a good candidate for plastic surgery.



FIGURE 2. A horse ride visit to Easter Island's monumental Moai in 1965.

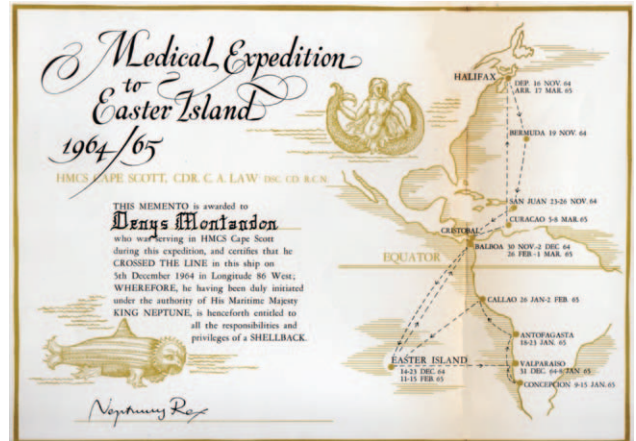


FIGURE 3. Crossing the Equator on Cape Scott, en route to Easter Island.

3 months before the departure of the Canadian ship Cape Scott from the port of Halifax (Fig. 3).

Jacalyn Duffin is the type of passionate investigator, who will not stop her inquiries before being certain that all the available sources have been collected. She then writes her story under the form of a history book, where every detail is duly referenced. She does not hesitate to underline all the controversies that arose before, during, and after the expedition. As a storyteller, writing with humor and elegant prose, Jacalyn succeeds in captivating the reader by the intimate observation of a group of scientists, technicians, translators, sailors, and journalists who most often had nothing in common, but were forced to collaborate and share a common life for several months.

### RAPAMYCIN AND MAMMALIAN TARGET OF RAPAMYCIN

A series of publications on the general health of the population, the viral and bacteriological infections, the ecological environment, were duly recorded and published in various scientific journals, but for several reasons, the second expedition—that is the survey after the completion of the airport—did not take place. One had to wait for Dr Duffin in 2017 to visit Easter Island, and compare the situation of the present Islanders to that described during the 1964 medical expedition. In advance, she had taken the time to screen the most meaningful results in available publications. Among them, she discovered that following the research on the soil samples extracted on Easter Island and brought back to Canada by bacteriologist Georges N6gr6dy, some of them contained bacteria, *Streptomyces hygroscopicus*, which were unknown so far. N6gr6dy gave these samples to Claude V6zina, another bacteriologist who worked at Ayerst Pharmaceuticals Company, and had greater facilities for growing these bacteria. Together with his colleague microbiologist-pharmacist Surendra Nath Sehgal, they discovered that these bacteria secrete a substance, which they called Rapamycin from the local name of the Island: Rapa Nui.<sup>3,4</sup> The antibiotic and antifungal actions of this substance as well as its effect on solid tumors, have been documented since 1969, and in 1974, Sehgal and Vezina were able to isolate the active principle of this new drug. Meanwhile, other colleagues of Ayerst began studying Rapamacin's effect as an immunosuppressive and anticancer drug. During the following years, more and more laboratories discovered the potential of this drug in 3 different biological realms: antibiotic, antiimmune, and anticancer. Based on its mechanism of action, it also gave rise to the understanding of a new



FIGURE 4. Assisting Dr Garry Brody.

physiological and pathophysiological regulation of the metabolism, at both the cellular and organismal level, the mTOR, for—“mammalian target Of rapamycin” or “mechanistic target of rapamycin.” A serine/threonine kinase, mTOR coordinates eukaryotic cell growth, and metabolism with environmental inputs including nutrients and growth factors. Extensive research over the past 2 decades has established a central role for mTOR in regulating many fundamental cell processes, from protein synthesis to autophagy, and deregulated mTOR signaling is implicated in the progression of cancer and diabetes, as well as the aging process.<sup>5</sup>

Drugs, like rapamycin, that act upon it are known as mTOR inhibitors. They may play an important therapeutic role in conditions like glucose homeostasis, muscle mass and function, adipogenesis and lipid homeostasis, immunity, brain function (Alzheimer and neurodegenerative disorders), autism, cancer, and aging. Of great interest for plastic surgeons are the recent investigations on their negative effect on angiogenesis. It is now used in the treatment of vascular malformations<sup>6</sup> showing clear evidence of interrupting growth of venous malformations. Rapamycin has also been shown to suppress angiogenesis and lymphangiogenesis in melanoma by down-regulating VEGF expression.<sup>7</sup> Other experiments have shown a clear positive effect on keloids and hypertrophic scars,<sup>8,9</sup> and in promoting allogeneic skin graft survival in mice.<sup>10</sup> To date,

more than 40,000 articles have been published in the peer-reviewed literature and rapamycin is worth billions. As recalled by Dr Duffin, the whole story of this drug would never have happened had the METEI alumni Georges Nógrády not shared his samples and encouraged research with scientists at Ayerst’s laboratories in Montreal.

## PLASTIC SURGERY

METEI’s purpose was not to treat or take care of the local patients. However, due to the arrest for political reasons of the Chilean physician soon after the arrival of METEI, the team of doctors was asked to care for the sick and attend childbirths. Independently, it was known that a few Islanders had contracted leprosy years before. Gabriel Hereveri was one of them, presenting multiple stigmata of Hansen disease. It was thus a great challenge for the talented young plastic surgeon, Garry Brody, to perform a Gillies temporal muscle flap to replace the paralyzed orbicularis muscle (Fig. 4). As a trainee in digestive surgery, which consists mostly in organ or tumors removal, I was fascinated by this dynamic reconstructive procedure and the consequence of this fabulous expedition for me could well have been the choice of plastic surgery as a specialty. Moreover, 1 year after having completed my training at New York University, I was able to participate in a surgical mission in Bénin (Africa), to treat a series of leprosy patients suffering of facial palsy, where I used a simplified, static method of eyelid correction of my own, allowing for good protection of the cornea with a more satisfactory esthetic outcome in most cases.<sup>11</sup>

The fascinating story of the 1964 to 1965 Medical Expedition to Easter Island, related in Dr Duffin’s book, might well spark other vocations among young physicians.

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