Introduction

Arch. Sc. Genève	Vol. 38	Fasc. 3	pp. 243-247	1985

INTRODUCTION

This volume consists of the papers delivered at a symposium held in Geneva on December 10 and 11, 1984, commemorating the two hundredth anniversary of the death of the Genevan biologist, Abraham Trembley (1710-1784). Trembley, while employed as tutor-in-residence for the two children of Count Bentinck of The Hague in Holland, rocked the scientific world with his discoveries concerning the "Polyp with arms shaped like horns," later designated as the genus *Hydra* by Linnaeus in 1746. Trembley's first book, which presented these findings, appeared in 1744 under the title *Mémoires, pour servir à l'histoire d'un genre de polypes d'eau douce, à bras en forme de cornes* (1744).

Among the many discoveries and experiments published in those beautiful *Mémoires* are the demonstrations that: a) complete animals can regenerate from small cut pieces of those animals; b) animals can reproduce asexually by budding; c) tissue sections from two different animals of the same species can be grafted to each other; d) the materials oozing out of the edges of cut tissue have properties that fit the definition of protoplasm as described by Dujardin one hundred years later; e) living tissues can be stained, and those stained tissues can be used in experiments; and f) "eyeless" animals can exhibit a behavioral response to light.

Trembley conducted and reported his experiments with a detail, caution, logic, and rigor rare for his time. In recognition of his accomplishments, he was elected to the Royal Society of London and in 1743 was awarded its prestigious Copley Medal, considered then to be one of the highest accolades in science. Martin Folkes (1743), president of the society, wrote to Trembley that the award was in honor of "those curious and surprising Discoveries . . . entirely unobserved in the Animal Creation, and indeed never so much as thought of, till they were brought to light, and made manifest by your diligent and exact Enquiries."

Many contemporary biologists have a vague image of Abraham Trembley as a minor eighteenth-century naturalist who discovered regeneration in hydra. That a number of biologists of intervening generations thought differently is evident in several pages of their tributes to Trembley (see Baker, 1952, pp. 47-48). Von Baer, for example, wrote in 1835 that Trembley's work "gradually but fundamentally influenced physiology . . . and thus medicine itself." Cuvier (1769-1832) had asserted that Trembley's discovery "changed . . . all the ideas that had been entertained about the physiology and anatomy of animals." And the German biologist Nussbaum wrote in 1887 that Trembley's *Mémoires* were "a classical model for a detailed biological investigation."

With the publication of the proceedings of this symposium and with the forthcoming English translation of Trembley's *Mémoires* (Lenhoff and Lenhoff, in press), the editors and our colleagues hope to reintroduce Abraham Trembley's remarkable contributions to the early development of experimental biology.

The idea for this commemorative symposium originated at the Fourth International Conference of Coelenterate Biology held in Interlaken, Switzerland in 1979, which was organized by one of the editors (P. Tardent). Following a talk on Abraham Trembley by the other editor (Lenhoff, 1980), and comments by direct descendants of Abraham Trembley, Alec Trembley and Dr. Jacques Trembley, the seed was planted as the four of us agreed that such a commemoration should take place. In fact, the published proceedings of that symposium were dedicated to Abraham Trembley. Trembley's *Mémoires,* the preface states, "not only represents an early and lucid example of the necessity, the value and ethics of biological experimentation, but provides a lasting stimulus and source of information to all those engaged in Coelenterate research. Many of Trembley's observations and experimental findings, so accurately described and illustrated, remain topics of today's discussions about the development and morphogenesis of *Hydra* in particular and Coelenterates in general" (Tardent and Tardent, 1980).

In 1983, the editors applied for a United States-Switzerland Cooperative Science Program grant from the National Science Foundation in the United States, and Professor Ronald Chessex, President of the Société de Physique et d'Histoire Naturelle de Genève, agreed to handle the complex local arrangements. From that moment, it seemed certain that the symposium would materialize.

The symposium, which was intended to mark the 200th anniversary of Trembley's death, was timed to coincide with the festivities of the unique Genevan holiday of the Escalade because that holiday has a special significance for the Trembley descendants. The celebration commemorates the battle in which the citizens of Geneva maintained the city's independence by forcing off the attacking soldiers of Savoy, an event which occurred fifty years after the Trembleys came to Geneva. Seventy years after the Escalade event of 1602 the Trembley family began the yearly custom of reuniting and signing a document thanking God for helping Geneva to remain free. This ceremony has continued in many of the subsequent gatherings of the Trembley family during the Escalade season. Hence we felt that to celebrate the City of Geneva and the memory of Abraham Trembley there would be no more festive and appropriate a time than at the Escalade, 1984. Our expectations were realized. On the last day of the Geneva symposium, participants, members of the Trembley family, organizers, and city officials gathered at the Trembley School, Rue Pestalozzi, Geneva, where a marble plaque honoring Abraham Trembley was dedicated (Figure 1).

The organization of the present volume follows that of the symposium, which was divided into three parts. The first focused on some historical aspects of Trembley's contributions to biology. The second dealt primarily with current research which is

linked to discoveries made by Trembley. The third part was concerned with some new directions that research on hydra is taking.

The featured speaker of the symposium was to have been Dr. John R. Baker, F.R.S., of Oxford University. Dr. Baker wrote an outstanding biography (1952) of Abraham Trembley, which has been extremely influential in introducing Abraham Trembley to contemporary biologists. Dr. Baker died on June 8, 1984 at the age of 83. We respectfully dedicate these proceedings to his memory.

In presenting the symposium proceedings the editors hope that, following upon Dr. Baker's work, this volume will help stimulate: a) more interest in the pioneering role Trembley played in experimental biology; b) more research into this area in the history of science; c) more interaction between biologists and historians of science; and, d) more experimental work on hydra.

ACKNOWLEDGEMENTS

It is our pleasure to thank the many individuals and institutions who helped make both the symposium and this publication possible. As we have already mentioned, Professor Ronald Chessex of the Société de Physique et d'Histoire naturelle de Genève was the key individual. Not only did he organize and handle all the details of the symposium, but he was instrumental in securing the official blessings of State and City of Geneva officials for the symposium and their participation in the dedication of the commemorative plaque at the Trembley School. Without his hard work, there would have been no symposium; we are truly grateful to Professor Chessex.

We also thank the following individuals: Professor J. Deferne for inviting us to publish these proceedings in the *Archives des Sciences;* Dr. V. Aellen, who as Director of the Museum of Natural History, graciously hosted the symposium and the Trembley Exhibition; Professor J. Wüest, for helping with the local arrangements, and for the elegant and memorable Escalade performance; Dr. Jacques Trembley and Mr. Alec Trembley, who, as direct descendants of Abraham Trembley, endorsed the symposium, supplied materials for the exhibition, helped with the local arrangements and contributed remarks to the symposium sessions and ceremonies; the officials of the State and City of Geneva, who afforded official recognition to the symposium, and who participated in ceremonies of the symposium and dedication of the plaque; and Dr. G. Bocquet and Dr. H.-M. Burdet of the Centre de Botanique et Conservatoire et Jardin Botanique for their warm and much appreciated hospitality.

We are also indebted to the numerous organizations which helped fund the symposium. In the United States, major support came from the division of the National Science Foundation which encourages Swiss-American cooperation (Dr. H. Uznanski, Director). Other significant funding used primarily for publication of these proceedings was provided by: The Cocos Foundation of Indiana; The Carnegie Institution

of Washington (Dr. James Ebert, president); School of Biological Sciences (Professors G. Stephens and B. Hamkalo, Dean and Associate Dean) and Division of Graduate Studies and Research (Professors J. Rodriguez, and S. Krassner, Dean and Associate Dean) of the University of California, Irvine; and the Society for Developmental Biology (Dr. J. Gall, president).

In Switzerland, we thank the Etat de Genève; the Ville de Genève; the Université de Genève, Faculté des Sciences (Professor Armand Buchs, Dean); Société helvétique des Sciences Naturelles; Museum d'Histoire naturelle (Dr. V. Aellen, Director; Société de Physique et d'Histoire naturelle de Genève (Professor Ronald Chessex, president); Office du Tourisme de Genève; Montres Rolex; and the Compagnie de 1602.

We have a few special words of thanks to express both to those who attended the symposium and to those who could not attend. To the participants, we appreciate their cooperation in a rather non-traditional scholarly adventure. To those who could not attend because of ill health, we thank: Mrs. L. Baker for her enthusiastic endorsement, for the use of the picture of her husband, Dr. John R. Baker, and for permission to publish excerpts from his biography of Abraham Trembley; Mrs. B. Bentinck Van der Wyck, a direct descendant of Abraham Trembley's employer, Count William Bentinck, and The Lord Gordon-Lennox, the current Duke of Richmond and direct descendant of Abraham Trembley's other notable employer, for their good wishes and interest in the symposium.

Finally, we thank the secretarial staff of the Department of Developmental and Cell Biology of the University of California, Irvine, and of the Zoological Institute of the University of Zurich for their cheerful help throughout all the stages of the symposium and the preparation of this volume.

Howard M. Lenhoff
University of California, Irvine

Pierre Tardent
University of Zurich

REFERENCES

BAKER, J.R. (1952). Abraham Trembley of Geneva: Scientist and Philosopher, 1710-1784. Edward Arnold & Co., London.

FOLKES, M. to A. Trembley. (November 30, 1743). Archives of the Jean-Gustave Trembley Family, Geneva.

LENHOFF, H. (1980). Our link with the Trembleys — Abraham (1710-1784), Maurice (1874-1942) and Jean-Gustave (1903-1977). In: Developmental and Cellular Biology of Coelenterates. pp. xvii-xxiv. P. Tardent and R. Tardent, eds. Elsevier, Amsterdam.

LENHOFF, S. and H. LENHOFF (in press). Translation into English of the *Mémoires* (1744) of Abraham Trembley. Boxwood Press, Palo Alto.

TARDENT, P. and R. TARDENT (1980). Developmental and Cellular Biology of Coelenterates. p.v. Elsevier, Amsterdam.

TREMBLEY, A. (1744). Mémoires, pour servir à l'histoire d'un genre de polypes d'eau douce, à bras en forme de cornes. Verbeek, Leyde.

Dr. John R. Baker, F.R.S., presiding at a meeting of the Royal Microscopical Society, 5th January, 1966.

(Photograph by Maxwell Scott)