

## Dr Willem Hendrik Dudok van Heel: A Tribute (13 May 1927–8 June 2021)

### Looking Back: A Personal Perspective by His Daughter

Growing up in a family where our father was working with marine mammals was for us children normal. My two brothers and I did not realise until we were older that having dolphins as “our pets” to swim with was quite extraordinary!

Our father was born and brought up in Bussum, the Netherlands, against a background of an old agricultural family firm, cultivating sugar beet seed. After school, he carried out his military service from November 1948 to September 1950 in Indonesia after he completed his officer training course. He met our mother in Djakarta where she was serving her term as a Wren with the Royal Netherlands Navy Women Service.

On his return home, he read Biology at the University of Utrecht, specialising in Sensory Physiology. He loved to sail and spent his youth sailing traditional Dutch vessels, a pastime which continued throughout his life whenever and wherever he had the chance to do so. Not surprisingly, our main home growing up was a renovated Dutch barge from the early 1960s onwards. Another interest of our father was falconry, which was an early means of studying animal behaviour and training. I remember having walks in the dunes in Den Helder, the Netherlands, flying our hawk and his taking her on the bus sitting on his arm. It raised quite a bit of interest when people realised she was a real bird!

His interest and ongoing research into marine mammals commenced by studying live cetaceans in 1956 and continued until his retirement in ~1985. The family followed wherever he went. My first recollection (at 3 years old) of him working with porpoises (*bruinvissen* [harbour porpoise, *Phocoena phocoena*]) caught in Denmark was on the island of Texel, the Netherlands. I remember clearly my parents working on the sensory project together.

During that same time, our father made contact with Mr. den Herder in Harderwijk, Netherlands, who, at that time, kept sea lions in a pond to entertain the public. Over the years and after lots of discussion, our father took his doctorate,

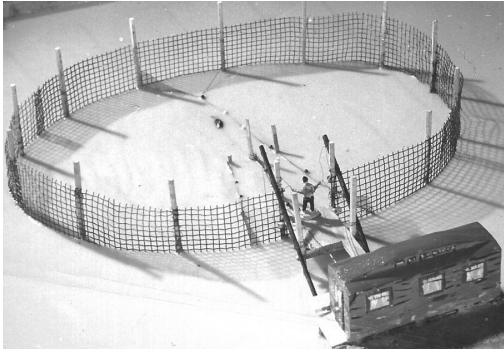


Dr. Willem Hendrik Dudok van Heel

gathered more research and facts, and he and Mr. den Herder, the investor, were ready. Finally, in 1964, a pool was built to keep dolphins. Our father suggested calling it a “dolfinarium” (Dutch spelling; “dolfinarium” in English), a name now commonly used worldwide for settings where dolphins and other marine mammals are kept. From 1965, the Dolfinarium evolved. Our father, as the curator, was able to continue his research alongside the money-making shows for the public.

His contacts with research friends in the United States and Canada grew, and he became a member of their International Association of Aquatic Animal Medicine (IAAAM). It became clear to our father that many articles and studies were appearing in numerous magazines (periodicals). He decided to start a journal that would pull all these studies/articles together. In 1972, the journal *Aquatic Mammals* was born. Personally, I remember loads of discussion regarding the journal and visits from English-speaking colleagues. I started speaking English at a very young age, bringing everyone coffee and tea. This was a language skill that became very useful at a later age when I married an English man!

While attending an IAAAM meeting, our father and his colleague/friend Victor Manton (Whipsnade Zoo) realised they were the only European attendees. So, another decision was made by him that it was time to set up a European association and the European Association for Aquatic Mammals,



Early days on Texel (1958)



With grandchildren (1988)

or EAAM, came to life. In 1972, a Symposium “Dolphins and Dolphinarium” in Harderwijk was held with attendees from 10 European countries, Japan, and Bermuda. It was a great success. I remember a lot of meetings and greetings, speaking lots of different languages, all chaired and directed by our father. Our family was totally involved and extremely proud of him. What followed was a fascinating period of years for our father and for marine mammal research in Europe and worldwide.

Our father always involved us children, and I was particularly interested and often was present when he and colleagues talked about their studies or when research was carried out in the Dolphinarium. My father encouraged me to work with him in later years, and initially I worked during the holidays, feeding dolphins under water. When I was older, I was fortunate to work as his assistant, carrying out administration, working on mammal nutrition, and keeping the seawater in top condition. So . . . from a young age, I learned a lot about sonar signals, maintaining perfect seawater, training marine mammals, and talking sensibly to scientists, asking the pertinent questions, speaking English, French, German, and a smattering of Danish. And I was not even 20 years old! Looking back, this was the University of Life and Science rolled into one! Therefore, it was very exciting to carry out all I had learned in Durban, South Africa. My father, then as a marine mammal advisor, assisted the Durban Aquarium in setting up a dolphinarium. I spent four wonderful years working with dusky (*Lagenorhynchus obscurus*) and bottlenose (*Tursiops truncatus*) dolphins and Cape fur seals (*Arctocephalus pusillus pusillus*).

The Dolphinarium expanded into Germany and Belgium, and so did the research at Harderwijk where several projects were carried out, including research in communication and further ways of transporting marine mammals. We all remember the arrival of “Gudrun,” the killer whale (*Orcinus orca*)!

A superb exhibition was added to the Dolphinarium featuring information from the evolution of marine

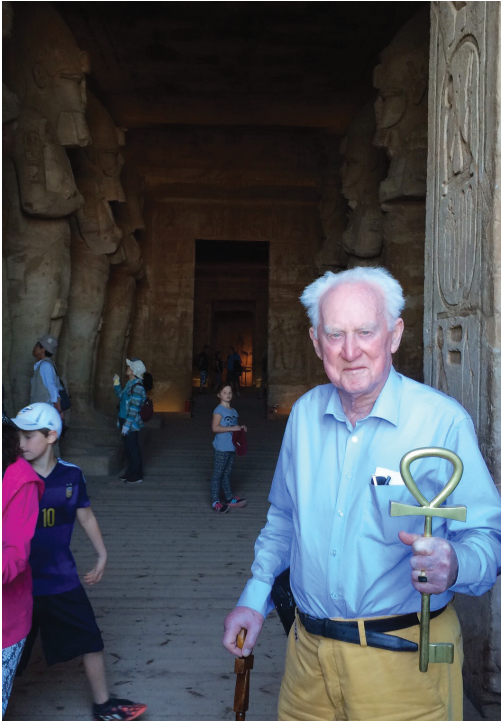
mammals to catching, husbandry, and research. It grew into a much detailed and captivating learning tool for those interested. I loved working in the exhibition as a guide to school groups and university students.

Our father’s reputation by now had become well known throughout the world, and he was asked to participate in films made by Dutch and British film companies with captivating programmes looking at marine mammals that explained some of the facts that had been established by scientists, as well as some of the mysteries that still existed. I remember the making of *The Talking Whale* and *Who Is Training Who?*, which clearly showed that dolphins have a great sense of humour!

Unfortunately, four years after the death of Mr. den Herder in 1975, the new Dolphinarium management and our father parted company. At that stage, he handed the helm of *Aquatic Mammals* over to Victor Manton. In the summer of 1979, he decided to retire from his scientific work. He fully retired from his advisory work in 1984 and sailed on the Dutch barge, *Cachelot*, to the Isle of Wight in the UK where I live. He was so very proud and pleased that the journal continues today.

Retirement did not mean “stop living”! Our parents lived in the UK for three years where they enjoyed sailing and being grandparents to my then young family. On their return to the Netherlands, they decided to live in Vlissingen where one of my brothers, Willem, lived and worked. Having met in Indonesia, my parents finally had the time to travel, and they loved going back to Indonesia on many occasions. They enjoyed life in Zeeland, and our father rekindled his lifelong interest in astronomy as well as his ongoing interest in Egyptian culture, which he shared with one of his granddaughters, Francis. Eventually, when father was 88, they toured Egypt together.

It was a great loss to our father when our mother passed away at the age of 86 in 2013. Emmy had been his backbone for 58 years as she typed up



In Egypt in front of Ramses II (2015)

meticulously all his scientific manuscripts and assisted him in his many projects and scientific studies as well as being the perfect hostess and a great cook. Our family life was never dull with the numerous visitors, day-in and day-out, during our father's working life.

Never too old to learn, he mastered use of an iMac computer and a mobile phone, and later on he was an enthusiastic user of Facetime, a perfect means to keep in contact over the years with children and grandchildren, especially those in the UK, until he was in his 90s. An avid reader his entire life, father's bookcase was a remarkable library of numerous interests. Many of these books his friends, children, and grandchildren will enjoy for many years to come.

Whenever possible, he always stayed in contact with scientific research in marine mammals. His own research is well documented in *Aquatic Mammals* (see Dr. Dudok van Heel's selected bibliography at the end of this tribute), on the Internet, and in libraries over the years.

In his own words, he was "deeply thankful for a Fascinating and Happy Life."

Saskia Taylor-Dudok van Heel  
and brothers Willem  
and Wolfert Dudok van Heel  
August 2021

## Remembering Dr. W. H. Dudok van Heel

Jaap van der Toorn

I met Dr. W. H. Dudok van Heel more or less by accident when looking for a Biology Master's project through my then fiancée (now wife) Jolanda's father, who ran a printing office in Harderwijk where the very first issues of *Aquatic Mammals* were printed. At the time, he was starting up a two-way communication project with the Harderwijk Dolfinarium's resident killer whale, Gudrun. Dudok (as many people called him, using only the first part of his last name) strongly believed that marine mammal parks could and should be involved in fundamental scientific research, both because these facilities have a unique opportunity to do so and because these projects challenge the animals. He was an authoritative, yet very open, approachable, and caring person. The fact that the dolphin training staff affectionately called him "pappie" (Dutch for "daddy"—a name coined by his wife Emmy but widely adopted by the staff) reflects his commitment to both the animals and the people who cared for them.

Dudok started his career in marine mammal research with the investigation of the acoustic sense of cetaceans, focusing on their echolocation and using the sonar of ships to acoustically visualize how porpoises sense their environment. He used his results to explain why some pelagic dolphin species strand on sloping sandy beaches. This study, carried out at the Zoological Station in Den Helder, the Netherlands, used harbor porpoises from Denmark. The study was partly supported by the Union of Tourist companies in Harderwijk. In 1964, this union asked Dudok to help set up a dolphin facility in Harderwijk. This was the start of the Dolfinarium Harderwijk for which four bottlenose dolphins were flown over from Florida. These dolphins were collected by Milton Santini who founded a facility on Grassy Key [in the Florida Keys], which became Flipper's Sea School (later renamed the Dolphin Research Center).

As curator of the Dolfinarium, Dudok had a unique opportunity to make dolphins available for scientific research, which included studies of dolphin vision by Ab Dral and a series of experiments on dolphin sonar by Cees Kamminga. The results of many of these studies have been published in *Aquatic Mammals* (see bibliography).

In 1972, the symposium "Dolphins and Dolphinaria" was held at Harderwijk, and this led to the formation of the European Association for Aquatic Mammals. It also marked the start of the *Aquatic Mammals* journal.

At the Dolfinarium, Dudok was constantly looking to improve the water quality for the dolphins. He introduced the addition of trace elements to the water to create a more natural water composition, being convinced this would benefit the animals more than adding mineral pills to the diet. He also worked on improving the chlorination process, and I remember many discussions on breakpoint chlorination. His adage was, "If you notice the swimming pool chlorine smell, you are not using enough chlorine."

The last research project Dudok conducted at the Dolfinarium was the two-way communication project in which I participated together with Cees Kamminga. Although some studies had been done on language comprehension in dolphins, none had provided the dolphins with opportunities to express themselves in a common language. The killer whale Gudrun was selected because she was very vocal and needed additional challenges. This project culminated in a paper (Dudok van Heel et al., 1982) and a British TV documentary, *The Talking Whale*. Shortly after completing the documentary, Dudok left the Dolfinarium.

After leaving the Dolfinarium, he continued to look for opportunities to set up a new facility where he could create new opportunities for research and where he could apply his vision for better artificial environments for dolphins. From the many discussions we had about water purification and related topics, it was clear that he was convinced that chlorination caused a biological imbalance that selectively removed bacteria and gave fungi a chance to thrive. He was also fascinated by the water purification techniques for seawater aquariums developed by Stephen Spotte at the Mystic Aquarium in Connecticut and wanted to apply and extend these techniques for dolphin facilities.

In 1984, I had an opportunity to work with Dudok again when he was asked to help create the Delfinaario at Särkänniemi in Tampere, Finland. He managed to convince the Särkänniemi management that this was a great opportunity to create a unique facility: the first indoor dolphinarium operating without chlorine and with minimum water loss. The water in the Delfinaario was not a standard saline solution but was an artificial seawater mix, which supported all the microorganisms needed to purify the water. Jolanda and I joined Dudok in Florida where the dolphins were collected under his supervision. The dolphins stayed in Florida for their initial adaptation and training at the Dolphin Research Center. Dudok travelled back and forth between Florida and Finland to support the training and follow the development and building closely to make sure an optimal dolphin environment was created. He also



In Denmark (1963)

prepared the transport of the dolphins to Finland. All this showed his broad interests, commitment, and organizational skills.

He was a great man in many respects: as a person, as a scientist, as an educator, and as a facilitator. It is sad that he cannot join the 50th anniversaries of the European Association for Aquatic Mammals and the *Aquatic Mammals* journal.

## Remembering Willem

Victor and Helen Manton

We were sorry to learn of Willem's demise. Willem and I (Victor) were students together when yacht racing at Burnham-on-Crouch.

I think the greatest result instituted by Willem was the very first conference held at Harderwijk in 1970. I well remember the panic when he realised just how many colleagues were interested enough to come and that ALL needed local hotel accommodation! We all know how successful the occasion was and how it led to the formation of EAAM and the development of *Aquatic Mammals*.

Many times after, Helen and I welcomed Willem into our home where we frequently had lengthy discussions—on any subject!

Long may he be remembered whenever the animals in which he was interested are being discussed.

### Editor's Note

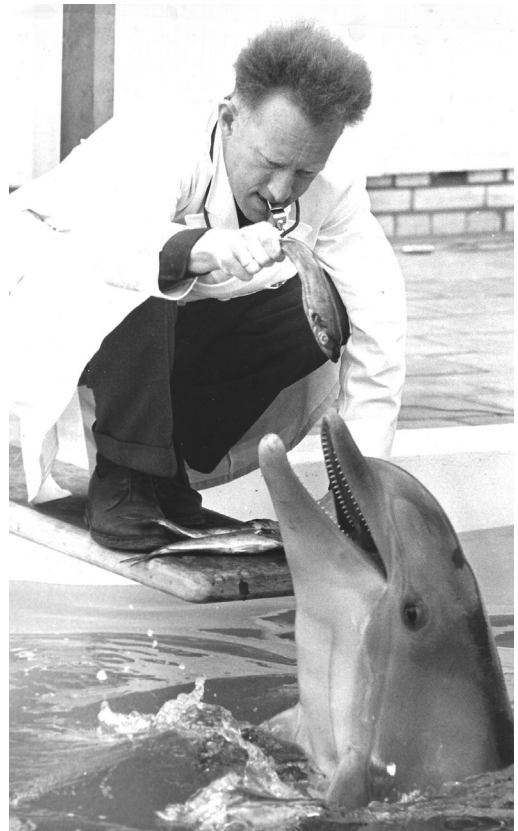
It is an honor to hold the same title, Managing Editor, established by Dr. Dudok van Heel nearly 50 years ago for the journal *Aquatic Mammals*. Earlier this summer, I was saddened to learn of Dr. Dudok van Heel's death from his daughter, Saskia Taylor-Dudok van Heel. I am pleased we can include this brief tribute to his life and legacy. I encourage you to read Dr. Dudok van Heel's *Historical Perspectives* essay published in the journal more than a decade ago (Dudok van Heel, 2009). He details the birth not only of *Aquatic Mammals* but also of EAAM. As a community and an array of sciences, we have learned much about marine mammals. Still, we should remember, honor, and revel in our history. Dr. Dudok van Heel established *Aquatic Mammals* in 1972, a first of its kind scientific periodical dedicated to sharing information to better understand all aspects of marine mammals. He was followed in his role of Managing Editor by Drs. Victor Manton (1982-1991), Paul Nachtigall (1992-1999), Jeanette Thomas (2000-2009), and me (2010-present). We thank him for his dedication, his service, and his forethought. Rest in peace.

Kathleen M. Dudzinski, Ph.D.  
Managing Editor

### Selected Bibliography of Dr. Dudok van Heel (Chronological Order)

- Dudok van Heel, W. H. (1959). Audio-direction finding in the porpoise (*Phocaena phocaena*). *Nature*, 183, 1063. <https://doi.org/10.1038/1831063a0>
- Dudok van Heel, W. H. (1962). Sound and Cetacea. *Netherlands Journal of Sea Research*, 1(4), 407-507.
- Dudok van Heel, W. H. (1966). Navigation in Cetacea. In K. S. Norris (Ed.), *Whales, dolphins, and porpoises* (pp. 597-606). University of California Press.
- Dudok van Heel, W. H., & Tiebor, J. (1966). Observations in flight reactions of *Tursiops truncatus* (Mont.) with some suggestions on flight planning. *Zeitschrift für Säugetierkunde*, 31, 370-372.
- Dudok van Heel, W. H. (1967). Differential linearity in the fluke. *Zeitschrift für Säugetierkunde*, 33, 383.
- Dudok van Heel, W. H. (1972). Transport of dolphins. *Aquatic Mammals*, 1(1), 1-32.
- Dudok van Heel, W. H. (1972). Raised levels of mercury and chlorinated hydrocarbons in newly captured *Tursiops truncatus* from Florida waters. *Aquatic Mammals*, 1(2), 24-36.

- Dral, A. D. G., & Dudok van Heel, W. H. (1974). Problems in image-focusing and astigmatism in Cetacea – A state of affairs. *Aquatic Mammals*, 2(1), 22-28.
- Dudok van Heel, W. H. (1974). Transport of dolphins. *International Zoo Yearbook*, 14, 66-67.
- Dudok van Heel, W. H. (1974). Remarks on a live Ziphiid baby (*Mesoplodon bidens*). *Aquatic Mammals*, 2(2), 3-7.
- Dudok van Heel, W. H. (1974). Birth in dolphins (*Tursiops truncatus*, Mont.) in the Dolfinarium Harderwijk, Netherlands. *Aquatic Mammals*, 2(2), 11-22.
- Purves, P. E., & Dudok van Heel, W. H. (1975). Locomotion in dolphins. Part I. Hydrodynamic experiments on a model of the bottle-nosed dolphin, *Tursiops truncatus*, (Mont.). *Aquatic Mammals*, 3(1), 5-31.
- Dudok van Heel, W. H. (1975). Remarks on the composition of water for dolphins in inland dolphinariums. *Aquatic Mammals*, 3(2), 4-9.
- Dudok van Heel, W. H. (1977). Successful treatment in a case of lobomycosis (Lobo's disease) in *Tursiops truncatus* (Mont.) at the dolphinarium, Harderwijk. *Aquatic Mammals*, 5(1), 8-15.
- Buijs, D., & Dudok van Heel, W. H. (1979). Bodyplan of a male sperm whale (*Physeter macrocephalus*) stranded



Dolphinarium Hardewijk (1965)

- near Breskens, Netherlands. *Aquatic Mammals*, 7(1), 27-32.
- Dudok van Heel, W. H., Kamminga, C., & van der Toorn, J. D. (1982). An experiment in two-way communication in *Orcinus orca* L. *Aquatic Mammals*, 9(3), 69-82.
- Dudok van Heel, W. H. (1983). Chlorination in marine mammal pools: A reappraisal. *Aquatic Mammals*, 10(1), 23-30.
- Kamminga, C., Wiersma, H., Dudok van Heel, W. H., & Tas'an, G. S. (1983). Investigations on cetacean sonar. VI. Sonar sounds in *Orcaella brevirostris* of the Makaham River, East Kalimantan, Indonesia; first descriptions of acoustic behaviour. *Aquatic Mammals*, 10(3), 83-94.
- Dudok van Heel, W. H. (1986). From the ocean to the pool. In M. M. Bryden & R. Harrison (Eds.), *Research on dolphins* (pp. 163-182). Oxford Science Publications.
- Dudok van Heel, W. H., & van der Toorn, J. D. (1988). A biological approach to dolphinarium water purification. II. A practical application: The Delfinaario in Tampere, Finland. *Aquatic Mammals*, 14(3), 92-106.
- Dudok van Heel, W. H. (2009). *Aquatic Mammals: A journal and an association*. *Aquatic Mammals*, 35(3), 399-411. <https://doi.org/10.1578/AM.35.3.2009.399>



Working in the Faroes (ca 1970s)