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Phillip C. Heemstra (1941–2019): Ichthyologist extraordinaire

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When Margaret Smith was appointed the first director of the JLB Smith Institute of Ichthyology (now the South African Institute for Aquatic Biodiversity) in Makhanda (formerly Grahamstown) in 1968 she was determined to build on the legacy of her husband, Professor JLB Smith. In 1978, she initiated a complete revision of his famous book, *Sea Fishes of Southern Africa*, initially planning to handle the whole revision herself with a research assistant. She soon realised that it would be impossible to do so and so, at the recommendation of Dr John Randall of Hawaii, she appointed Dr Phil Heemstra, a highly respected taxonomist from the University of Florida in the USA as her co-editor. This was a master stroke as Heemstra – approachable, meticulous, dedicated, talented – proved to be a huge asset.

Taking into account the specialisation that had taken place in ichthyology in recent years, Smith and Heemstra soon realised that they could not produce *Sea Fishes* alone, so they enlisted the services of the leading international authorities on each fish family occurring in the southern African region. The book eventually involved 77 collaborators from 15 countries and was titled *Smiths' Sea Fishes* to acknowledge the contributions of both Smiths. The multi-authored volume covered 2150 fish species in 270 families, with Heemstra authoring or co-authoring an impressive 74 family accounts. In 1990, Heemstra made a further important contribution to marine fish taxonomy by co-editing, with Ofer Gon, *Fishes of the Southern Ocean*, in which he authored 7 of the 49 family accounts. His legacy will be confirmed with the publication of *Coastal Fishes of the Western Indian Ocean* later in the year, successor to *Smiths' Sea Fishes*, and for which he authored more than 70 of the 260 family accounts.

At the time of Heemstra's formal retirement in March 2002, several colleagues published tributes to him in the Ichthyology Institute's newsletter, *Ichthos*, that emphasise his mentorship and guidance:

I was privileged to have had Phil Heemstra as the Senior Marine Scientist throughout my term as Director. Phil was the unquestionable successor to the legendary JLB Smith, and shared many of JLB's characteristics – tenacity, utter dedication, a deep love of his work, and an obstinate determination to do what had to be done no matter how many obstacles were placed in his path. Pinned on to his wall was a saying that epitomised his approach to life: 'Yard by yard, life is hard; inch by inch, it's a cinch'. I believe that a good taxonomist – as was Phil – needs to have particular traits in order to succeed: meticulous to a fault, an ability to concentrate on minutiae while always keeping the big picture in mind, and a thorough understanding of the theory behind the practice.

Professor Mike Bruton, Director of the Ichthyology Institute, 1982–1994

Phil's greatest accomplishment was his collaboration with Margaret Smith and many colleagues around the world to produce a fresh version of Smiths' Sea Fishes. This monumental work, widely proclaimed as 'the fisherman's bible' and 'the best book of its kind in the world', involved not only world-class research but also a truly spectacular level of project management and coordination. He also produced a steady stream of original publications on taxonomy and systematics in peer-reviewed journals and was the expert on fishes of the Western Indian Ocean.

Not content with merely again revising Smiths' Sea Fishes in 1996 Phil embarked on another major challenge – to document the fishes of the Western Indian Ocean (WIO). In doing so he followed a path well worn by the Smiths' Sea Fishes project, by inviting recognized world authorities to revise the families in the WIO and prepare accounts as chapters for the proposed book. However, Phil wrote most of the chapters himself.

Other major achievements included co-editing the authoritative Fishes of the Southern Ocean (with Ofer Gon), Groupers of the World (with Matt Craig and Yvonne Sadovy), and numerous scientific papers. He also served as editor of the Ichthyology Institute's scientific publications.

Heemstra participated in many expeditions to various sites in the Western Indian Ocean (WIO), from the Red Sea to Mozambique, the Comoros Islands, Madagascar, Mauritius and Rodrigues. These and other endeavours ensured that he became the world's leading authority on the fishes of the WIO. Together with his wife, Elaine, he developed 'Fishwatch', a pioneering science communication project through which recreational SCUBA divers were encouraged to identify and record fishes observed on their dives... 'Fishwatch' expeditions became an important source of original new material in the form of specimens and photographs for the revision of the fishes of the WIO.

When Phil formally retired, in order that his wealth of knowledge would not be lost, he was created the Institute's first Emeritus Marine Scientist, allowing him to focus on the WIO book. Under Phil's fastidious editorship the Institute's publications enjoyed a fine international reputation and a high standard. These and other strengths are ultimately what made him a fine marine systematist.

Professor Paul Skelton, Director/Managing Director of the Institute, 1995–2011

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I worked as Phil Heemstra's mangrove mud Research Assistant for 21 years. I was initially employed by Margaret Smith while Phil was on sabbatical leave in the USA and Phil was merely told that he had an assistant to help with revising Sea Fishes. Phil taught me everything I know about fish identification and all other aspects relating to fish taxonomy, methods of cleaning and staining, skeletal preparations, etc., and I could not have had a more patient and thorough teacher. He never wearied of answering the same questions repeatedly and was always willing to peer down a microscope and check my identifications or correct my mistakes. In the beginning, while I was still helping Margaret Smith, I would approach him and announce that I could not see the lateral line pores or count the gill rakers, or something like that. He always replied, 'Don't you know that she only gives you the difficult ones she can't do herself?' Being involved in the various stages of the

production of Smiths' Sea Fishes was a tremendous learning experience, and we all felt a great sense of achievement when it was finally published ... I remember someone asking him many years ago whether he ever tired of fishes. His reply described him in a nutshell: 'I am eternally fascinated by fishes.'

Joan Wright, Heemstra's Research Assistant

One day, asking him if he would be able to complete a particular section for the WIO fishes book, his answer was, 'It's do-able'. And that was Phil – you got on with the job at hand and DID IT. He epitomised the words of Elizabeth Barrett Browning: 'Great things must be done greatly, with a great purpose, a great mind, a great courage, a great energy and a great persistent patience.'

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