

The role of female cephalopod researchers: past and present

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This paper explores the contribution that women past and present have made to cephalopod research. It includes short biographies of eight female cephalopod researchers who are now deceased: Jeanne Villepreux-Power, Anne Massy, Grace Watkinson, Grace Pickford, Anna Bidder, Zulma Castellanos, Katharina Mangold and Martina Roeleveld. In addition, biographies are provided for six female cephalopod researchers who are now retired but who have made an enormous contribution to cephalopod knowledge during their lifetimes: Nancy Voss, Marion Nixon, Joyce Wells, Julia Filippova, Eve Boucaud-Camou, and Renata Boucher-Rodoni. Online supplementary information provides a bibliography of the research outputs of these 14 researchers, who between them, since 1837 have published more than 800 scientific papers making an in-depth contribution to the field of cephalopod research.

Keywords: Cephalopoda; gender; women; STEM

Introduction

There is increasing debate about the paucity of women in STEM (science, technology, engineering and mathematics) and a view that science remains institutionally sexist, with evidence for bias against women well documented (e.g., Steinpreis 1999; Miller and Chamberlin 2000; Trix and Psenka 2003; Schmader et al. 2007; cited in Schroeder et al. 2013; Ceci and Williams 2011; Adamo 2013; Larivière et al. 2013).

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Nonetheless, the reasons for reduced numbers of women in the higher echelons of academia are complex and it is not our intention to address them here. Instead, we wish to highlight the careers and achievements of female cephalopod researchers who have succeeded in the past, despite adversity, and hence provide role models for active female researchers today. It has been suggested (see for example discussion in Schroeder et al. 2013) that women often have lower visibility in science, that there may be gender disparity in invitations to give keynotes at conferences, and that females disproportionately decline invitations to speak. Mindful of some of these issues, two of us (JEM and EAGV) invited a female cephalopod biologist (ALA) to make a keynote presentation at the Cephalopod International Advisory Council (CIAC) Symposium in Florianópolis, Brazil in 2012 celebrating the achievements of past and present female cephalopod researchers.

A bibliometric analysis of the papers presented during this Symposium suggests that, despite having a female chair and an Organizing Committee clear-minded about women-in-science issues, the CIAC 2012 Symposium reflected the general bias against women documented elsewhere. Although registered delegates showed a balanced gender distribution (i.e., 57% and 43% of the researchers who attended the Symposium were male and female delegates, respectively; Figure 1A), the analysis of the presentations suggests otherwise. For example, among the posters presented during the event (133), 97% were authored by at least one male researcher, 3% of them being authored exclusively by female researchers, while 71% of the posters were authored by at least one female author, 29% being authored exclusively by male researchers (Figure 1D). The picture is similar when we look at oral presentations: among the oral papers delivered during the Symposium (89), 94% were authored by

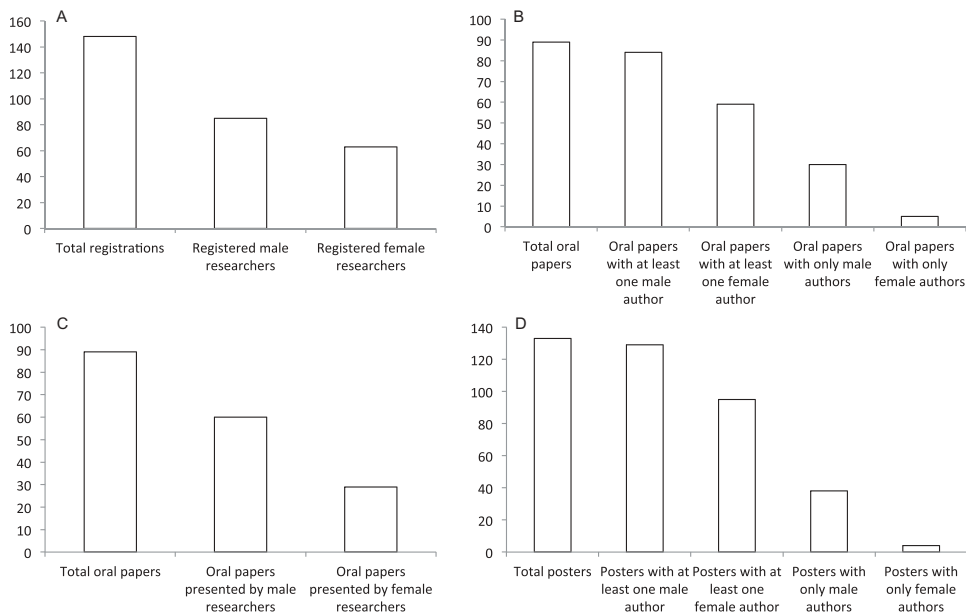


Figure 1. Bibliometric analysis of the papers presented during the CIAC 2012 Symposium. (A) Registrations by gender; (B) authorship of oral presentations by gender; (C) presenters of oral presentations by gender; (D) authorship of poster presentations by gender.

at least one male researcher, contrasting with 66% of those authored by at least one female researcher, which means that 34% of the oral papers were authored only by male researchers, and 6% only by female researchers (Figure 1B). However, when the gender of the presenter (the researcher who has effectively given the talk) is considered, the picture is considerably worse: 67% of the presenters were male and 33% female researchers (Figure 1C), i.e., less than half of the oral papers authored by female researchers were actually presented by them.

The response to the presentation '*Women in cephalopod research: past and present*' delivered by ALA during the CIAC 2012 Symposium showed that many colleagues, both male and female, felt that a written account, highlighting the many successes of pioneering female cephalopod researchers and their contribution to the cephalopod research community, particularly through their contribution to CIAC, would be timely and appropriate. We present it here, as an introduction to this Special Issue, and hope that it will be an inspiration to current researchers, both male and female, and serve as a reminder of the importance of research outputs of female scientists having equal visibility to those of male colleagues. The unmistakable features of these scientists, many of whom are illustrated in Figure 2, were their pioneering attitudes, exceptional knowledge and genuine love for science. Indubitably, this passion made them live very long and productive lives, while producing an in-depth contribution to the field of cephalopod research. To further enhance the visibility of the research of the included scientists, we present tables listing the cephalopod taxa they described (Table 1), the cephalopod taxa named in their honour (Table 2) and their complete bibliographies in Supplementary online information.

The careers of noted female cephalopod researchers

Jeanne (Jeanette) Villepreux-power (1794–1871)

- 1794 Born 25th September at Juillac (Corrèze, France) in a rural family.
- 1812 Moved to Paris to work as an embroiderer.
- 1816 Met James Power, a wealthy Irish merchant established at Messina (Sicily). She learned both English and Italian, and began to teach herself natural history.
- 1818 Married James Power and joined him at Messina. Began to explore the island of Sicily, its historical sites, and studied the local flora and fauna. She revealed herself as an excellent illustrator.
- 1832 Built different types of sea-water aquaria and submerged cages (for in situ work) to study live marine animals, including *Octopus* and *Argonauta*.
- 1833 Carried out aquarium experiments on brood shell repair in *Argonauta argo*.
- 1834 Reported her experimental results at the Academy of Catania (she subsequently was elected a member of this academy and later joined a dozen other academies).
- 1835 Sent her manuscript to Paris in order to have it submitted to the Academy of Science.
- 1837 Henry de Blainville claimed at the Paris Academy that her results and conclusions were erroneous, since he firmly believed that *Argonauta* inhabited, but did not produce the brood shell!
- 1838 Settled with her husband at London.



Figure 2. Female cephalopod scientists. (A) Jeanne (Jeanette) Villepreux-Power (1794–1871). Detail from original photograph taken by A. E. E. Disdéri in 1861. (B) Julia Arsent'evna Filippova (1934–present). (C) Zulma Judith Ageitos de Castellanos (1922–2010). (D) Martina Compagno Roeleveld (1943–2006) (left) with María Edith Ré, currently of the National Patagonic Institute in Puerto Madryn, Argentina (right). Photo taken during the 1997 CIAC meeting in Capetown by Angel Guerra. (E) Nancy A. Voss (1929–present). (F) Katharina Maria Mangold-Wirz (1922–2003). Photo by Eric Hochberg. (G) Joyce Wells (1930–present). Photo by Angel Guerra, 1987. (H) Renata Boucher-Rodoni (1942–present). (I) Eve Boucaud-Camou (1939–present). (J) Marion Nixon (1930–present). Photo by Angel Guerra, 1992, Aberdeen.

Table 1. Cephalopod taxa described by senior women cephalopod researchers.

Taxa	Reference	Current status	Reference
Anne Massy			
<i>pfefferi</i> , <i>Helicocranchia</i>	Massy, 1907: 382	Valid species	see Voss 1980: 382
<i>profundicola</i> , <i>Polypus</i>	Massy, 1907: 377	= <i>Bathypolypus ergasticus</i> (Fischer & Fischer, 1892)	fide Norman and Hochberg 2005: 141
<i>normani</i> , <i>Polypus</i>	Massy, 1907: 379	= <i>Muusoctopus januarii</i> (Hoyle, 1885)	fide Gleadall 2013: 109
<i>umbellata</i> , <i>Cirroteuthis</i>	Massy, 1909: 4	= <i>Opisthotenthis massyae</i> (Grimpe, 1920)	fide Villanueva et al. 2002: 966
<i>arabica</i> , <i>Sepia</i>	Massy, 1916: 228	Valid species	see Reid et al. 2005: 69
<i>brevis</i> , <i>Moschites</i>	Massy, 1916: 158	= <i>Eledone massyae</i> Voss, 1964	fide Voss 1964: 511
<i>natalensis</i> , <i>Sepia</i>	Massy, 1925: 212	= <i>Sepia simoniana</i> Thiele, 1920	fide Voss 1962: 247
<i>joubini</i> , <i>Sepia</i>	Massy, 1927: 161	Valid species	see Reid et al. 2005: 147
<i>robsoni</i> , <i>Rhombosepion</i>	Massy, 1927: 159	= <i>Sepia robsoni</i>	fide Voss 1962: 248
Grace Pickford			
<i>bimaculoides</i> , <i>Octopus</i>	Pickford & McConnaughey, 1949	Valid species	see Norman and Hochberg 2005: 133
<i>vincenti</i> , <i>Octopus</i>	Pickford, 1955	= <i>Amphioctopus burryi</i> Voss, 1950	fide Norman and Hochberg 2005: 144
Zulma de Castellanos			
<i>argentinus</i> ,	de Castellanos, 1960: 55	= <i>Illex argentinus</i> (de Castellanos, 1960)	fide Roper et al. 1969: 317
<i>Ommastrephes</i>			
<i>lobensis</i> , <i>Octopus</i>	de Castellanos & Menni, 1969: 92	= <i>Octopus tehuelchus</i> d'Orbigny, 1834	fide Norman and Hochberg 2005: 138
Katharina Mangold			
<i>oxygonius</i> , <i>Illex</i>	Roper, Lu & Mangold, 1969: 299	Valid species	see Roper et al. 1998: 415
Martina Campagno Roeleveld			
<i>adami</i> , <i>Sepia</i>	Roeleveld, 1972: 224	Valid species	see Khromov et al. 1998: 83
<i>angulata</i> , <i>Sepia</i>	Roeleveld, 1972: 242	Valid species	see Khromov et al. 1998: 84
<i>faurei</i> , <i>Sepia</i>	Roeleveld, 1972: 251	Valid species	see Khromov et al. 1998: 97
<i>pulchra</i> , <i>Sepia</i>	Roeleveld & Liltved, 1985: 2	Valid species	see Reid et al. 2005: 147
<i>magnificus</i> , <i>Octopus</i>	Villanueva, Sanchez & Compagno Roeleveld, 1992: 39	= <i>Enteroctopus magnificus</i>	fide Hochberg 1998: 203

(Continued)

Table 1. (Continued).

Taxa	Reference	Current status	Reference
<i>Notonykia</i>	Nesis, Roeleveld & Nikitina, 1998: 153	Valid genus	see Roper and Jereb 2010: 355
<i>africanæ</i> , <i>Notonykia</i>	Nesis, Roeleveld & Nikitina, 1998: 154	Valid species	see Nesis 2000: 274
<i>machelæ</i> , <i>Uroteuthis</i> (<i>Photololigo</i>)	Roeleveld & Augustyn, 2005: 98	Valid species	See Jereb et al. 2010: 110
Nancy Voss			
<i>elongata</i> , <i>Calliteuthis</i>	Voss & Voss, 1962: 184	= <i>Histioteuthis reversa</i> (Verrill, 1880)	fide Voss et al. 1998: 305
<i>corona</i> , <i>Calliteuthis</i>	Voss & Voss, 1962: 191	= <i>Histioteuthis corona corona</i> (Voss & Voss, 1962)	fide Voss 1969: 773
<i>berryi</i> , <i>Histioteuthis</i> <i>corona</i>	Voss, 1969: 781	Valid subspecies	see Voss et al. 1998: 339
<i>eltaminae</i> , <i>Histioteuthis</i>	Voss, 1969: 755	Valid species	see Voss et al. 1998: 313
<i>macrohista</i> , <i>Histioteuthis</i>	Voss, 1969: 845	Valid species	see Voss et al. 1998: 329
<i>bruuni</i> , <i>Histioteuthis</i>	Voss, 1969: 811	= <i>Histioteuthis meleagroteuthis</i> (Chun, 1910)	fide Voss et al. 1998: 350
<i>calypso</i> , <i>Opisthoteuthis</i>	Villanueva, Collins, Sanchez & Voss, 2002: 946	Valid species	see is Hochberg et al. 2014: 251
<i>hardyi</i> , <i>Opisthoteuthis</i>	Villanueva, Collins, Sanchez & Voss, 2002: 963	Valid species	see Norman et al. 2014: 252
Julia Filippova			
<i>akimushkini</i> , <i>Cycloteuthis</i>	Filippova, 1968: 119	Valid species	see Nesis 1987a: 240
<i>aspera</i> , <i>Galiteuthis</i>	Filippova, 1972: 400	= <i>Galiteuthis glacialis</i> (Chun, 1906)	fide Nesis 1987a: 275
<i>knipovitchi</i> , <i>Moroteuthis</i>	Filippova, 1972: 392	= <i>Filippovia knipovitchi</i> Bolstad, 2010	fide Bolstad 2010: 133
<i>Kondakovia</i>	Filippova, 1972: 392	Valid genus	see Roper and Jereb 2010: 365

(Continued)

Table 1. (Continued).

<i>longimana</i> , <i>Kondakovia</i>	Filippova, 1972: 395	Valid species	see Kubodera et al. 1998: 285
<i>mascarensis</i> , <i>Sepia</i> (<i>Doratossepion</i>)	Filippova & Khromov, 1991: 63	Valid species	see Reid et al. 2005: 144
<i>plathyconchalis</i> , <i>Sepia</i> (<i>Sepia</i>)	Filippova & Khromov 1991: 66	Valid species	see Reid et al. 2005: 146
Renata Boucher-Rodoni			
<i>subplana</i> , <i>Sepia</i>	Lu & Boucher-Rodoni, 2001: 185	Valid species	see Reid et al. 2005: 149
<i>Microleodone</i>	Norman, Hochberg & Boucher-Rodoni, 2004: 194	Valid genus	see Norman et al. 2014: 149
<i>mangoldi</i> , <i>Microleodone</i>	Norman, Hochberg & Boucher-Rodoni, 2004: 194	Valid species	see Norman et al. 2014: 150
<i>Galeoctopus</i>	Norman, Boucher-Rodoni & Hochberg, 2004: 247	Valid genus	see Norman and Hochberg 2005: 138
<i>lateralis</i> , <i>Galeoctopus</i>	Norman, Boucher-Rodoni & Hochberg, 2004: 248	Valid species	see Norman and Hochberg 2005: 138
<i>tongaensis</i> , <i>Chonetenthis</i>	Lu & Boucher-Rodoni, 2006: 39	Taxon not yet reviewed	
<i>jumeau</i> , <i>Scaevargus</i>	Norman, Hochberg & Boucher-Rodoni, 2005: 325	Valid species	see Norman et al. 2014: 172
<i>nesisi</i> , <i>Scaevargus</i>	Norman, Hochberg & Boucher-Rodoni, 2005: 329	Valid species	see Norman et al. 2014: 172
<i>tuber</i> , <i>Scaevargus</i>	Norman, Hochberg & Boucher-Rodoni, : 321	Valid species	see Norman et al. 2014: 172
<i>Histoctopus</i>	Norman, Boucher-Rodoni & Hochberg, : 325	Valid genus	see Norman et al. 2014: 141
<i>discus</i> , <i>Histoctopus</i>	Norman, Boucher-Rodoni & Hochberg, 2009: 326	Valid species	see Norman et al. 2014: 143
<i>zipkasae</i> , <i>Histoctopus</i>	Norman, Boucher-Rodoni & Hochberg, 2009: 329	Valid species	see Norman et al. 2014: 141

Table 2. Cephalopod taxa named in honour of senior women researchers.

Taxa	Reference	Current Status	Reference
Anne Massy			
<i>massyae</i> , <i>Tetronychoteuthis</i>	Pfeffer, 1912: 102	= <i>Pholidoteuthis massyae</i>	fide O'Shea et al. 2007: 426
<i>massyae</i> , <i>Cirroteuthopsis</i>	Grimpe, 1920: 233	= <i>Opisthoteuthis massyae</i>	fide Villanueva et al. 2002: 966
<i>massyae</i> , <i>Eledonella</i>	Robson, 1924: 202	=? <i>Bolitaena massyae</i>	fide Robson 1932: 328
<i>massyae</i> , <i>Eledone</i>	Voss, 1964: 511	Valid species	see Nesis 1987: 299
Grace Pickford			
<i>Pickfordiateuthis</i>	Voss, 1953: 609	Valid genus	see Brakonieccki 1996: 10
<i>pickfordi</i> , <i>Doryteuthis</i>	Adam, 1954: 149	= <i>Uroteuthis pickfordi</i> ; valid species; generic affinity unresolved	see Vecchione et al. 1998: 221
Katharina Mangold			
<i>mangoldi</i> , <i>Microeledone</i>	Norman, Boucher-Rodoni & Hochberg, 2004: 194	Valid species	see Norman et al. 2014: 150
<i>mangoldae</i> , <i>Asperoteuthis</i>	Young, Vecchione & Roper, 2007: 354	Not yet reviewed	
Julia Filippova			
<i>filippovae</i> , <i>Todarodes</i>	Adam, 1975: 3	Valid species	see Dunning and Wormuth 1998: 387
<i>Filippovia</i>	Bolstad, 2010: 133	Not yet reviewed	

1838 Anastasio Cocco names Power's deep-water light fish, *Gonostomus poweriae* Cocco, 1838 [= *Vinciguerria poweriae* (Cocco, 1838)], in her honour.

1839 Richard Owen defended the study of Villepreux-Power at the London Zoological Society, based on her large collection of well preserved *Argonauta* specimens having undergone brood shell operation (with subsequent repair) that demonstrated the high quality of her experimental study.

1842 Published an impressive, richly illustrated guide-book on Sicily ('*Guida per la Sicilia*') covering the history of Sicily, indicating sites worthy of a visit for each town and village, describing and illustrating hundreds of plants and animals, fossils and minerals, including detailed descriptions of the vegetation covering the freshly eroded (post-eruption) surfaces of the Etna volcano.

1871 Died 26th January, aged 77, at Jullac.

Jeanne Villepreux was born in Juillac, daughter of a shoemaker. Her mother died when she was young, and at 18 she moved to Paris to seek work. Her true gift as an artist was discovered during her work as an embroiderer in Paris. It was because of this talent that she was commissioned to work on a wedding gown for the marriage of Princess Caroline to Charles Ferdinand, the younger son of Charles X of France, in

1816. And it was through this commission that she met James Power, a wealthy Englishman who fell in love with her and married her (Debaz 2012).

After her marriage, she moved, with her husband, to Messina, a city in Sicily which was a natural draw to visiting scientists. Since she was an avid reader with a fabulous memory, she soon gained possession of a solid liberal education, which she further developed by her exploration of the island. In Sicily she became well connected, mixing with respected scientists (Di Angelo 2012) and likely conversed with, amongst others, Johannes Müller and Albert Kölliker, who visited Messina during her time there (Groebe 2008). She built her own natural history collections, interacting with local fisherman to obtain the specimens she desired and enhance her knowledge (Di Angelo 2012). Her two published guides to Sicily (Power 1839, 1842) were unique in that they encompassed such broad knowledge of the surrounding landscape, encompassing accurate information on geology, archaeology, and particularly natural history, and reflected her extensive first-hand knowledge.

Her most famous work, however, was on cephalopods. She made numerous careful observations and carried out extensive experiments, involving regeneration of the shells from shell fragments, to determine that the shell of the argonaut was actually secreted by the animal: a fact that went against the established view (that the shell was ‘acquired’). Although the veracity of her findings were denied by some, they were championed by Sir Richard Owen, founder of the British Museum of Natural History, who presented her results to the Zoological Society of London (Owen 1839), and Sander Rang, the renowned French malacologist. Jeanne also studied *Octopus vulgaris*, particularly its use of tools, illustrating how individuals use stones to hold open the shells of *Pinna nobilis* (Power 1860).

In order to pursue her natural history observations on octopuses and argonauts, Jeanne Villepreux designed and built a variety of holding cages which she maintained both at her home and anchored in the port (Groebe 2008), effectively inventing modern aquaria. She further suggested that these might be modified to raise juvenile fish for repopulating Sicily’s rivers, thus also advancing modern aquaculture (Arnal 2000).

She left Sicily in 1843 and much of her collection, and many notes and drawings were lost in a shipwreck (Arnal 2000), possibly explaining why her publications are limited to just a few (Giacobbe 2012).

Jeanne was the first female member elected to Catania’s Academy of Natural Sciences, and was a member of at least 16 other academies. Described as the ‘mother’ of aquaria by Richard Owen, her work had a profound impact on the field of marine biology.

Anne (Annie) Letitia Massy (1868–1931)

- 1868 Born 29th January in Netley, Hampshire, England.
- 1885 Aged 17, recorded the first occurrence of a European redstart in Ireland.
- 1899 Published her first contribution to *Irish Naturalist*: a report on the land shells from County Limerick.
- 1901 Began work for the Irish Fishery Department.
- 1907 Published her first scientific paper which included a description of three new species: *Polypus normani*, *Polypus profundicola*, *Heliocranchia pfefferi* (Table 1).

- 1912–1924 Three cephalopod species are given the specific epithet *massyae* in her honour (Table 2).
- 1931 Died on 16th April, aged 63, after a short illness.
- 1932 Her last two publications published posthumously.
- 1964 *Eledone massyae* is named in her honour (Table 2).

The early life of Anne Massy has always been something of a mystery and biographies have failed to find even a record of her birth in the Irish register. However, digitized English birth registers show that Annie Letitia Massy was born in Netley, Hampshire in 1868. Her father was Hugh Deane Massy of Limerick (Byrne 1997). He became a surgeon in the British Army and it is likely that he was posted to the Royal Victoria Hospital, a military hospital in Netley at the time of Annie's birth. Where she grew up is unclear. In the 1881 census, age 13, she was in the north of England, living in a small boarding house with her sister Susan (age 11), and they are listed on the census forms as 'scholars'. She was certainly in Ireland at the age of 17 in 1885 as she recorded the first observation of redstarts nesting in that country. Already apparent at this time was her keen interest in the natural world. Aged 23, she was lodging as a woman 'of independent means' in Warwick, England, according to the 1891 census, and at some point she travelled to Switzerland, since she recalls this in a note to the *Irish Naturalist* (Massy 1922). Possibly her father, who died in 1879, provided for her in his will. But by the 1890s she was certainly back in Ireland. Robert Lloyd Praeger, the founder and editor of *Irish Naturalist*, wrote 'Miss Massy I first met in 1894; at that time she had not yet published anything, but was an interested member of the Dublin Field Club, with a good knowledge of birds and marine Mollusca' (Praeger 1949). Her publication on land shells of County Limerick suggests that she spent at least some time at her father's house 'Stagdale' in Co. Limerick. By 1901, according again to census data, she was living in Malahide, Co. Dublin, with her elderly cousin Constance Aster, and it was in this year that she began a 'temporary' job in the Fisheries Division of the Department of Agriculture and Technical Instruction. It has been insinuated elsewhere (Sigwart and Leonard 2009) that the temporary nature of her job was a reflection of her gender rather than her expertise. Indeed she remained on a temporary contract for the next 30 years until her death.

During these 30 years she established an international reputation. Although for the first few years she continued only to publish minor reports in the *Irish Naturalist*, she published her first scientific paper in 1907. She described three new species of cephalopod in the *Annals and Magazine of Natural History* (later to become *Journal of Natural History*) and this was the start of a career as a professional scientist that was to garner international respect. Despite her lack of formal training and, to the best of our knowledge, any formal qualifications, she quickly established a reputation that led to her being sent molluscs from the Discovery Expedition, the British Antarctic 'Terra Nova' Expedition, and from locations as far flung as India and South Africa. She had regular correspondence with other cephalopod experts of the time such as Guy Robson, Georg Pfeffer and William Hoyle. Four species of cephalopods have been named in her honour by some of the most eminent male researchers of that time (Table 2). There is also a genus of pteropod, *Massya*, named in recognition of her contribution to this branch of molluscan taxonomy (she described and named the type species of the genus).

Despite her professional activities, her interest and involvement with amateur naturalists continued. She was one of the founding members of the Irish Society for the Protection of Birds in 1904 and, in 1926, when the society was on the point of collapse, took on the role of Honorary Secretary. Under her guidance, the society was revitalized. She remained Honorary Secretary for the remainder of her days, resigning just days before her death on 16 April 1931 after a short illness (Farran and Moffat 1931).

During her career, she described numerous species (Table 1), made 13 contributions to the *Irish Naturalist* (later the *Irish Naturalist Journal*) and published 24 scientific papers on molluscs, the majority of which were on Cephalopoda. Her careful taxonomic observations are still referred to by researchers today. Extensive investigations in Ireland (Byrne 1997) suggest that no photographs or portraits of Anne Massy exist.

Grace Blair Watkinson (1879–1959)

1879	Born 1st March in Hartford, Connecticut, USA.
1902	BA Smith College, Massachusetts.
1905	MA University of Zurich, Switzerland.
1905–1907	Leipzig University, Germany.
1906–1907	Fellow American Women's Table, Stazione Zoologica, Naples, Italy.
1908	PhD University of Zurich, Switzerland.
1908–1909	Assistant Zoology Instructor, Smith College, Massachusetts.
1959	Died, aged 80, Rochester, New York.

Grace Watkinson was born into a wealthy Connecticut family and educated at Smith College, a private women's college in Massachusetts, founded in 1871 to provide an education equal to men's. Here, she was President of the Biological Society, and upon graduating with a BA, she took a course in Zoology at the Marine Biological Laboratory at Woods Hole. She then moved to Europe studying in Germany, Switzerland, and Italy. She divided her time between the Albert Ludwig University in Freiburg, Leipzig University, and the University of Zurich, where she obtained her MA in 1905, and a PhD in 1908. She held the fellowship of the American Women's Table in the Stazione Zoologica, Napoli, Italy, in 1906–1907. In 1909, her important comparative study of 16 genera was published in which she suggested that the olfactory organs of these cephalopods were chemosensory, although she offered no experimental proof. Her view was upheld 65 years later by an ultrastructural study of these organs in *Octopus* (Woodhams and Messenger 1974).

Grace returned to America, working at Smith College as an Assistant Zoology Instructor from 1908 to 1909. By 1910, she was in New York, teaching biology in high schools. Nevertheless, she returned again to Europe, marrying Richard Werner Marchand, whom she had met in the laboratory of Carl Chun in Leipzig, in London in December 1911. Her husband took a post at the Rockefeller Institute for Medical Research in Princeton, New Jersey and this return to the USA marked the end of her scientific research career. Nevertheless, her achievements were remarkable for a woman of that time. Grace was widowed in 1936, and died at the home of one of her sons, in 1959, at the age of 80.

Grace Evelyn Pickford (1902–1986)

- 1902 Born 24th March in Bournemouth, England to William Pickford, a newspaper editor and her mother, a governess.
- 1925 Graduated from Newnham College, Cambridge University.
- 1931 PhD conferred by Yale University. Subsequently printed in 1937 as ‘*A monograph of the acanthodriline earthworms of South Africa*’ by her father’s newspaper, the Bournemouth Guardian.
- 1931 Joined the Bingham Oceanographic Laboratory at Yale University, New Haven, Connecticut.
- 1936 Began to publish an extensive series of papers on Vampyromorpha that continued until 1949.
- 1947 Began research on the killifish *Fundulus heteroclitus*.
- 1951 Joined a leg of the *Galathea* deep-sea research expedition.
- 1953 A genus of myposid squid, *Pickfordiateuthis*, is named in her honour (Table 2).
- 1954 *Doryteuthis pickfordi* is named in her honour (Table 2).
- 1957 Appointed Lecturer at Yale University, where she spent the next 23 years focusing on fish endocrinology.
- 1969 Appointed Full Professor at Yale University.
- 1970 Retired.
- 1981 Received the Wilbur Lucius Cross Medal from the Yale Graduate School.
- 1982 The International Society of Comparative Endocrinology established the Grace E. Pickford Medal.
- 1986 Died 20th January, aged 83.

Grace Pickford was born and grew up in England, and studied at Cambridge University. She was a founding member of the Cambridge University Biological Tea Club (Slobodkin and Slack 1999) where she mixed with fellow students such as Joseph Omer Cooper (subsequently Chair of Zoology at Rhodes University), George Evelyn Hutchison (limnologist and Professor at Yale), Gregory Bateson (anthropologist). She married George Hutchison briefly and accompanied him first to South Africa, where she studied earthworms for her PhD, and subsequently to Yale. A lectureship was apparently out of the question for women at that time (Slack 2003) but Hutchison secured research space for her before accepting his own position there. She subsequently established herself at Yale’s Bingham Oceanographic Laboratory as a Research Fellow, Assistant, and later Associate. Although Grace Pickford may be best known for her work on fish endocrinology that began in 1947, the cephalopod world will remember her remarkable series of papers on *Vampyroteuthis* that she produced between 1936 and 1959. Grace was the first to recognize the unique features of *Vampyroteuthis* that distinguished it from other octopods, raising a new order, Vampyromorpha, to accommodate the genus. Her conclusions were drawn from careful anatomical work and based on the collections at Yale’s Bingham Oceanographic Laboratory, and other collections at her disposal. Her investigations were typically thorough. In 1938 she wrote that she had “now re-examined all known specimens, with the exception of two young larvae” and based on these studies, she was able to conclude that only a single species of vampyromorph existed, synonymizing all other genera and species under Chun’s original *Vampyroteuthis infernalis*. These meticulous studies resulted in access to other

collections and her participation in a leg of the Danish *Galathea* expedition. Her invitation from Anton Bruun came at a time when women could not participate on the US Navy research vessels (Slack 2003). Even on *Galathea* she was the sole female amongst 104 men (White 1951). According to Wolff (1956), when Grace joined *Galathea* in Colombo, “there was a little murmuring in corners at this invasion of our masculine stronghold by a woman”. However her enthusiasm and dedication (for example completing a paper on octopuses in the Raffles Museum whilst the ship was in Singapore for repairs) quickly made her part of the team. At that time her ‘knowledge of cuttlefish and octopuses’ was described as ‘so great that what she did not know was not worth knowing’ (Mielche 1953). She later described her three months in the Indian Ocean, Gulf of Siam and South China Sea as a ‘privilege’ (Pickford 1959) and spoke about it with great pleasure (Ball 1987).

After refocusing her research on fish endocrinology, she built a long and successful career at Yale University, despite Yale most definitely being a man’s world at that time. Indeed, when promoted, a year before her retirement, she became the first female biologist to become a full professor at Yale (Slack 2003). Truly she broke new ground. Despite the disadvantages and obstacles conferred by her gender, she published 135 research papers and obtained 32 years worth of National Science Foundation funding. She was noted not only for her intellectual ability and drive, but also for her integrity and kindness (Ball 1987).

Anna McClean Bidder (1903–2001)

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|------------|---|
| 1903 | Born 4th May in Cambridge, England to George Parker Bidder and Marion Greenwood Bidder, both academics. |
| 1915–1921 | Perse School, Cambridge. |
| 1921–1922 | University College London. |
| 1922–1928 | Newnham College, Cambridge. |
| 1926–1928 | Basel, Switzerland, spent winter sessions. |
| 1926 | Graduated from Newnham College, Cambridge University. |
| 1934 | PhD conferred by Cambridge. Thesis title: ‘ <i>The functional morphology of the digestive system of cephalopods.</i> ’ |
| 1929–1965. | Taught zoology at University of Cambridge. |
| 1939 | Took a place on the Society of Friends Peace Committee until 1946. |
| 1950 | Founder member of the ‘Dining Group’, later known as <i>The Society of Women Members of the Regent House who are not Fellows of Colleges.</i> |
| 1963 | Hugh Watson Curator of Malacology in the Museum of Zoology, Cambridge until 1970. |
| 1965 | Became first President of Lucy Cavendish College, a role she fulfilled for the next five years. |
| 1973 | President of the Zoological Section of the British Association for the Advancement of Science. |
| 1989 | Co-author of the cephalopod volume of Grassé’s <i>Traité de Zoologie.</i> |
| 1991 | Elected Fellow Honoris Causa by the Linnean Society of London. |
| 2001 | Died 1st October, aged 98. |

Anna McClean Bidder was born in Cambridge on 4th May, 1903 to a wealthy but academic family. Her father, George Parker Bidder, was a zoologist, but his father

had made money through collieries. Her mother, Marion Greenwood Bidder was a botanist and physiologist and her family owned a textile business. Anna studied first at University College London and then at Cambridge, graduating in zoology in 1926. She worked briefly in Basel, Switzerland, researching yolk absorption in *Loligo* before returning to Cambridge to commence a PhD on the functional morphology of the cephalopod digestive system (Haynes 2001). Despite going on to pursue research, neither Grace Pickford (see previous) nor Anna Bidder was awarded an undergraduate degree from Cambridge equivalent to those awarded to men, as the university authorities refused to officially recognize the women's colleges until 1948. Experiencing the lack of equality afforded women in academia first hand, Anna, in 1951, formed a 'Dining Club' with two other female academics. This was the origin of a new female college. After much campaigning, Lucy Cavendish Collegiate Society became an Approved Society for women graduates in 1965, and admitted its first undergraduates in 1972. The College was very short of funds in its early years, and Anna's family wealth was invaluable: she served as its first President in an unpaid capacity (Anon 2001).

In 1986, Peter Douglas Ward visited Anna and recorded their conversation, and included a transcription in a chapter entitled '*Nautilus* observed: Anna Bidder 1960' in his book (Ward 1988). This includes Anna's description of her childhood and early studies in France, and interest in cephalopods.

During this period Anna did not neglect her academic research. In 1960 she obtained funding to study *Nautilus* and subsequently departed for the west Pacific. The results of her research were published in *Nature*. Anna's vast knowledge of cephalopods can be seen in chapters in Grassé's 1989 '*Traité de Zoologie: Anatomie, Systématique, Biologie. Tome V. Céphalopodes*', of which she was a co-editor with Adolf Portmann and Katharina Mangold.

Katharina Mangold and Marion Nixon visited Anna in Cambridge on several occasions in the 1990s. She showed them her careful drawings of the digestive system of *Nautilus* while describing the organs and their functions in considerable detail. Anna was kind and generous especially with young teuthologists. On one occasion she invited all the participants of a meeting of cephalopod biologists to lunch where she proved a gracious hostess as well as an entertaining one, full of stories of her expedition to the Pacific to investigate *Nautilus*. She was a member of the University Women's Club in Mayfair, London, and delighted in surprising her visitors by revealing a secret door in the library. Even after retirement she was full of enthusiasm about the work that was being carried out on cephalopods, and talked often of her work at the Cambridge University Zoology Museum, and at Lucy Cavendish College when for relaxation during the lunch hour she would row on the river Cam.

She remained active until late into her life. Together with JZ Young she made a brief appearance at the 1993 CIAC-endorsed Southern Ocean Cephalopod Symposium in Cambridge. In 1997 (aged 94) she attended and spoke at a celebration marking the grant of a royal charter and full university college status to Lucy Cavendish College (Traub 2001). The college crest bears a *Nautilus* in her honour.

After her death Paul Rodhouse was given her collection of reprints and books, including some rare early publications. The collection was held at the British Antarctic Survey until Paul's retirement when they were given to Lucy Cavendish College Library. They are available for the use of visiting cephalopod workers by arrangement.

Zulma Judith Ageitos de Castellanos (1922–2010)

- 1922 Born 6th April in San Antonio de Areco, Buenos Aires Province, Argentina to José María Ageitos and Leonor Deban.
- 1935–1940 Studied at Ladies College, La Plata National University.
- 1941–1947 Studied Zoology at La Plata National University.
- 1943–1990 Taught and researched in Zoology, mainly in Malacology, at La Plata National University.
- 1947 PhD conferred by La Plata National University. Thesis published in *Revista del Museo de La Plata* in 1953.
- 1947 Married Luis María Castellanos.
- 1948 Began to publish an extensive series of papers on Gastropoda and Polyplacophora that continued until 1995.
- 1960 Published ‘Una nueva especie de calamar argentino: *Ommastrephes argentinus* sp. nov. (Mollusca, Cephalopoda)’ in *Neotropica*, and began to research intensively on the cephalopods of the southwest Atlantic Ocean.
- 1967 Published ‘*Catálogo de los moluscos marinos bonaerenses*’, containing 11 species of cephalopods.
- 1983–1996 Published four text book volumes on invertebrates.
- 1986 Included in a biographical dictionary of relevant Argentine women from 1556 (Sosa de Newton 1986).
- 1990 Retired from teaching, but continued researching and publishing.
- 2000 Declared ‘Outstanding Woman of La Plata’ by the City Council.
- 2010 Died 29th August in La Plata, aged 87.

Zulma Judith Ageitos was born 6 April 1922 in San Antonio de Areco, a small pampas village within the Province of Buenos Aires, that she always remembered as ‘a land of gauchos and wheat fields’. As a teenager, her family moved to La Plata, where she lived for the rest of her life. She made foundation studies at the Ladies College of La Plata National University and went on to study Zoology at the Faculty of Natural Sciences and Museum of the same institution. As early as 1943, she revealed herself to be an enthusiastic student of invertebrates, particularly molluscs, and she began her teaching career at the University as a Teaching Assistant. The year 1947 was a landmark in both her professional and personal life. She was awarded a PhD for her study on the ganglionic structure of Argentine molluscs under the guidance of Prof. Raúl A. Ringuelet and, on April 16th, she married Luis María Castellanos. While she upgraded her teaching position to that of Full Professor of Invertebrates I, she researched intensively a diversity of both marine and freshwater taxa. Between 1948 and 1995 she published 115 scientific articles on Polyplacophora, Bivalvia, Gastropoda, and Cephalopoda. Her research on Microgastropoda represents an outstanding contribution to the knowledge of the group in the southwest Atlantic region. Four gastropod species were named in her honour: *Littoridina castellanosae* Gaillard, 1974 (now *Heleobia castellanosae*), *Calliostoma castellanosae* Brunet, 1995, *Turbonilla zulmae* Pimenta & Absalão, 1998, and *Zilchogyra zulmae* Miquel, Ramírez & Thomé, 2004. Her papers on taxonomy of Argentinian Polyplacophora were cited by the main treatises on invertebrate zoology at that time, e.g. Grassé (1959: vol. 5, part 2) and Hyman (1967: vol. 5). She had a close

relationship with the Instituto Antártico Argentino so she examined most mollusc samples gathered during the Argentinean Antarctic surveys.

In 1960, she started her research on cephalopods with the description of a new species of squid: *Illex argentinus*. In the following years she published on the biology of the Argentine squid and the São Paulo squid *Loligo brasiliensis* (now *Doryteuthis sanpaulensis*) and increased our knowledge of *Martialia hyadesi*; she wrote only the second article on this species 77 years after its description. In 1967 her catalogue of the marine molluscs of Buenos Aires Province appeared with information on the description and distribution of 286 species, 11 of them cephalopods. From 1977 to 1980 Zulma published her last three papers on cephalopods. Between 1988 and 1993 her '*Catálogo descriptivo de la malacofauna marina magallánica*' appeared in 12 installments (covering Polyplacophora and Gastropoda).

Zulma acted as a supervisor for 24 undergraduate degrees and PhD theses, five of them on cephalopods. She was Chief Editor of the scientific journal *Neotropica* (1975–1992) and the monographic series '*Fauna de agua dulce de la República Argentina*' (1982–1995). In 1970 she was in charge of the restoration of the Invertebrates Hall of La Plata Natural Sciences Museum.

Simple food, simple dressing, no makeup. She never left her small-town customs. In all modesty she used to say that she knew very little, but yet she identified enigmatic samples of the invertebrate fauna of Argentina with a speed and certainty that dazzled students and colleagues.

Zulma was a wonderful teacher. Her lessons were delightful in the classroom, but her day-by-day interchange of experience was still better. Her lab was open to students collecting their own samples in the field. She was even more enthusiastic than younger people when invertebrates appeared under the microscope. Zulma often said 'look at this... oh, please look...', while she was at the microscope... but nobody could see anything until she realized she had to give up her place. On any kind of microscopic animal she was able to provide an academic explanation and show some books or papers from her library to illustrate the finding. And she was really generous in sharing her knowledge.

At home, with the same care, she was devoted to her children and grandchildren, who lived in adjoining houses to hers until the end.

Like most of her generation, national policy deeply marked Zulma's life but she had the rare virtue of maintaining her political views while making social compromise. After retiring, she moved from policy to action by walking low-income neighbourhoods to seek help for needy families, teaching the principles of health care and teen pregnancy prevention. This was the authentic Zulma. Close to people, she perhaps did even better than among the palatial sophistication of university policy.

Katharina Maria Mangold-Wirz (1922–2003)

1922 Born 23rd May in Basel, Switzerland, daughter of Eduard Wirz (1891–1970, school teacher, free-lance historian and writer) and Clara Wirz-Bürgin.

1940 Graduated from high school in Basel.

1943 Completed three years of medical studies at Basel University.

1948 Completed her zoology studies at Basel University 1943–1948; PhD (D Phil II). Her thesis was published in 1950 in *Acta Anatomica*.

- 1948 Awarded a three-year scholarship by the Janggen-Pöhn Foundation (St. Gallen, Switzerland) 1948–1951 for research mainly on gastropods (opisthobranchs) in Villefranche-sur-Mer and Banyuls-sur-Mer, France (from 1950).
- 1951 Full-time researcher (Attachée de Recherche) in the French Centre National de la Recherche Scientifique (CNRS) 1951–1961. From this point her research was mostly on cephalopod biology.
- 1958 Married Walter Mangold (born 1909 in Basel, Switzerland).
- 1961 Awarded Doctorat ès Sciences Naturelles (Doctorat d'État) from Paris University. Thesis published in a 1963 supplement of *Vie et Milieu*.
- 1961 Research fellow (Chargée de Recherche) at CNRS 1961–1965.
- 1966 Senior Researcher (Maître de Recherche = Directeur de Recherche de deuxième classe) at CNRS 1966–1987.
- 1969 Appointed visiting Research Professor, Memorial University, Newfoundland, Canada.
- 1981 Attended CIAC Charter Meeting in Plymouth, England.
- 1983 Attended CIAC Charter Meeting in Banyuls-sur-Mer, France where she was appointed the first President of CIAC, 1983–1985.
- 1987 Retired.
- 1989 The cephalopod volume of Grassé's *Traité de Zoologie* is published (Grassé and Mangold 1989).
- 1994 Appointed Honorary Life Member of CIAC.
- 2003 Died 10 November 2003 in Basel, aged 81.
- 2004 *Microeledone mangoldi* named in her honour.
- 2007 *Asperoteuthis mangoldae* named in her honour.

Katharina Mangold spent her early years together with her parents and her brother Eduard (Edi) in Basel. After high school she started medical studies with the ambitious project to become a brain surgeon. A consultation with one of the leading specialists in Switzerland convinced her that she was not a promising candidate for this severe profession, since she was female, short, and appeared frail! She therefore gave up her original project and continued her university studies in Zoology. She finally worked on the brains of non-human mammals, the zoologist Adolf Portmann (1897–1982) being her major professor and PhD advisor. Professor Portmann subsequently guided her post-doctoral activities in marine zoology at Villefranche-sur-Mer and Banyuls-sur-Mer and remained her mentor to the end of his life.

Starting in 1950, Katharina's cephalopod studies in Banyuls were conducted in the full-time research system of the French C.N.R.S. In this system, a foreign PhD title was good enough to be provisionally hired by C.N.R.S. (Attaché de Recherche), but to get tenure (Chargé de Recherche), one had to be a French 'Docteur d'État'. Hence Katharina's second thesis published in 1963.

The years from 1950 to 1975 were inspiring, productive years, marked not only by Katharina's full integration in the Laboratoire Arago 'family', but also by her regular participation in international meetings, e.g. the 2nd International Oceanography Congress held in Moscow in 1966 (with a cephalopod symposium organized by Gilbert L. Voss). Starting in the early 1960s,

Adolf Portmann associated Katharina Mangold as his co-author for the revision of the cephalopod volume in Grassé's *Traité de Zoologie* (the original version submitted by Portmann in 1958 had been deemed too concise by Professor Grassé!). This revision became a very long process, since all attempts by the tandem Portmann and Mangold to integrate the respective 'latest results published' led to a never-ending race against time. The very efficient editorial assistance of Anna Bidder starting in the 1970s finally brought the cephalopod volume to completion.

For several years from 1976, Katharina encountered serious 'bio-political' problems. In September 1975, Katharina and her collaborator Dr. Dieter Frösch (employed on a Swiss scholarship since 1973) attended an international symposium, sponsored by C.N.R.S. and held in Lille, France. The subject area was '*Biosynthesis, metabolism and action at the cell level of hormones in invertebrates*'. Mangold and Frösch presented a communication entitled 'Neurosecretion in the orbita of octopod cephalopods'. This presentation – or something related to it that nobody realized – apparently displeased one of the symposium organizers, an influential member of the C.N.R.S. committee that evaluated Katharina's application (in December 1975) to be promoted to the rank of Directeur de Recherche (= DR 1ère cl.). Under normal circumstances, this application would have been supported by a majority of committee members, but under the 'special circumstances' then reigning, the promotion was turned down. Although Katharina Mangold remained the official leader of the (still heavily criticized) 'Cephalopod Group' at the Laboratoire Arago in Banyuls, the guerrilla warfare lasted several years, preventing Dieter Frösch from being hired by C.N.R.S. Disgusted with this adversity, Kathy intensified her international contacts and travelled more regularly than before to participate in collaborations abroad. Thus she was able to at least enjoy the quiet after the storm. Two comforting highlights of her life in Banyuls were (1) the organization of the first CIAC workshop and symposium in 1985, two years before she retired, and (2) the long awaited publication of the cephalopod volume in Grassé's *Traité de Zoologie*, in 1989.

Katharina continued to publish long after her official retirement and was a prominent figure at meetings internationally, not least because of her vitality.

Katharina always helped teuthological and other new-comers from Basel University to get off the ground with their research in Banyuls (e. g. Hans-Rudolf Haefelfinger, Pio Fioroni, Marcus von Orelli, Alfred Bürgin, Sigurd von Boletzky, Hans-Jürg Marthy) and she remained the most popular mentor for female students engaged in cephalopod research – be it in Banyuls or elsewhere. She had played that role early on for Eve Boucaud-Camou (Caen and Luc-sur-Mer), Helen Bradbury (St. Johns, Newfoundland), Renata Boucher-Rodoni (her first PhD student from Geneva), Pilar Sánchez (Barcelona), Patrizia Jereb (Mazaro del Vallo), Teresa Borges (Faro). This role naturally led to a 'grandmother' status when subsequent generations started in cephalopod research (e.g. Laure Bonnaud, Renata's PhD student in Paris). Katharina's last PhD student before she retired was Richard Tait from the University of Melbourne (Australia). After retirement Katharina kept in touch with colleagues and continued to publish.

Nancy A. Voss (1929 – present)

- 1929 Born 20th November in Boston, Massachusetts, USA.
- 1951 Obtained a Bachelor of Arts from Mt. St. Agnes College, Baltimore, MD, USA. Entered graduate program at The Marine Laboratory, University of Miami, Miami, Florida, USA.
- 1954 Obtained a Masters degree from the University of Miami.
- 1955 Co-authored with husband Gilbert L. Voss an ecological study of Soldier Key, Florida.
- 1957 Returned to The Marine Laboratory as Research Instructor after the births of her two children.
- 1960 Co-authored with Gilbert L. Voss an ecological study of Bimini, Bahamas.
- 1969 Published a monograph on the family Histiot euthidae.
- 1973 Appointed Research Assistant Professor at the Rosenstiel School of Marine and Atmospheric Science (RSMAS; formerly The Marine Laboratory), University of Miami.
- 1974 Appointed Research Associate Professor at RSMAS.
- 1980 Published generic revision of the family Cranchiidae.
- 1981 Appointed Research Professor at RSMAS.
- 1981 Attended CIAC Charter Meeting in Plymouth, England, and was the histiot euthid and cranchiid section leader at the *International Workshop on Taxonomy and Identification of Cephalopod Beaks* in Plymouth.
- 1983 Attended CIAC Charter Meeting in Banyuls-sur-Mer, France where she was appointed to the first CIAC council. She remained on council until 1991.
- 1985 Section leader at the *International Workshop on the Early Growth Stages of Cephalopods*, and Session Chair at the CIAC Symposium on the *Biology and Distribution of Early Juvenile Cephalopods* at Banyuls-sur-Mer, France.
- 1986 Elected President of CIAC, and was Rapporteur at the CIAC Symposium on *Life History, Systematics and Zoogeography of Cephalopods* in Monterey, California, USA.
- 1988 Group leader and gave two presentations at the CIAC International Workshop on Systematics and Biogeography of Cephalopods in Washington DC, USA.
- 1989 Appointed Director of the RSMAS Marine Invertebrate Museum.
- 1990 Participated in the Symposium on *Systematics, Biology and Fisheries of Cephalopods* in Woods Hole, Massachusetts, USA.
- 1998 Edited the 1998 *Smithsonian Contributions to Zoology* volume resulting from the 1988 workshops.
- 1999 Participated in the Workshop *Systematics, ecology and biology of cirrate octopods* in Washington DC, USA.
- 2001 *Nancyplax vossi* a crab species, is named in her honour, recognizing her promotion of the collections in her care.
- 2004, 2006 *Lumbricalus vossae* and *Scolelepis vossae*, both polychaete worms, are named in her honour.
- 2007 Became Research Professor Emeritus at RSMAS.

Nancy Voss is Emeritus Professor at the Rosentiel School of Marine and Atmospheric Science at the University of Miami and Director of the Marine Invertebrate Museum there. Nancy first joined University of Miami as a graduate student in 1951, and apart from a short career break to raise a family after marrying Gil Voss in 1952, she has worked or studied there all her life.

Nancy has undertaken hugely valuable systematic and zoogeographic studies on pelagic cephalopods, studying families with global distributions and slowly accumulating sufficient specimens to find discriminating and uniting characters for difficult groups. Her earliest papers are not on cephalopods but she was swiftly drawn in. Her first single-authored cephalopod manuscript described new species of Histioteuthidae and laid the groundwork for an awesome monograph on the family. This volume, at more than 150 pages, described new species and subspecies, synonymized genera, redefined the genus *Histioteuthis*, and designated neotypes. It included illustrations (by Nancy) of beaks, radulae, buccal membranes, spermatophores, as well as the habitus and main feature of all the species. By the time of the 1981 beak workshop in Plymouth, England, Nancy was focusing on cranchiids as well as histioteuthids and she led the work for these chapters in Malcolm Clarke's classic text. Her work on the family Cranchiidae was extensive and she produced a generic revision, and phylogenetic studies of the family, including detailed work on the genus *Teuthowenia*. She wrote a chapter on cranchiid evolution for Volume 12 '*Palaeontology and neontology of cephalopods*' of *The Mollusca* (Clarke and Trueman 1988).

Nancy also obtained larval material of cranchiids, histioteuthids, and promachoteuthids. Her contribution to the 1985 CIAC workshop on early life forms was substantial, her material and knowledge forming the basis for the chapters on these families in the '*Larval and juvenile cephalopods*' volume.

Her contributions to CIAC workshops are clear from her research. But she was also a founder member, contributing to the 'charter meetings' at the 1981 Plymouth workshop and the 1983 Banyuls workshop, from which CIAC was borne. Nancy served as the second CIAC President from 1986–1988 and continued to serve on the Council until 1991.

Nancy was the lead editor on the highly cited 1998 double volume in Smithsonian Contributions to Zoology resulting from a 1988 CIAC systematics workshop. This workshop brought together researchers from around the world and enabled access to unreported Atlantic collections and collections in institutes in the former USSR. Editing did not deter Nancy from embracing this opportunity to advance her research. Together with Kir Nesis and Paul Rodhouse, she produced another monographic chapter on Histioteuthidae.

Nancy took over as Director of the Rosentiel School Marine Invertebrate Museum in 1989 and since then has had her research time squeezed tremendously. Nevertheless, she has lent her vast knowledge and experience of systematics and biogeography to another difficult group, the cirrates, at the cirrate workshop held in Washington, DC in 1999. She retains her post as Professor Emeritus and is still working on cranchiid manuscripts whenever time permits.

Marion Nixon (1930 – present)

1930 Born 11th August, Thornton Heath, Surrey, England.
1942–1948 Selhurst Grammar School for Girls, Croydon, Surrey
1955 Married Dennis Andrew Nixon.

- 1956–1962 Birkbeck College and Chelsea College, University of London, part-time degree course.
- 1962 Bachelor of Science, Zoology
- 1962 Joined the Anatomy Department, University College London.
- 1968 PhD awarded by University of London based on her studies of feeding and growth in *Octopus vulgaris*.
- 1972 *Oxford Book of Vertebrates*, Oxford University Press.
- 1977 Co-organized meeting of cephalopod researchers at The Zoological Society of London, and co-edited the resulting volume with John Messenger.
- 1983 Attended the Charter Meeting of CIAC in Banyuls-sur-Mer, France.
- 1983–1988 Editor of CIAC Cephalopod Newsletter.
- 1995–1997 Member of CIAC Council.
- 1994–2014 Publication of chapters for Coleoidea volume of the *University of Kansas Treatise of Invertebrate Paleontology*.
- 2012 Appointed Honorary Lifetime Member of CIAC.

Marion Nixon worked at University College London where, as well as periods spent at the Stazione Zoologica, Naples, her research was carried out. Cephalopods, and especially *Octopus vulgaris*, dominated her research and resulted in almost 50 years of publishing including more than 60 papers and book chapters. She collaborated with some of cephalopod biology's outstanding researchers. Her first publication was with Noel Dilly and Andrew Packard and latterly chapters on living and fossil cephalopods for *The University of Kansas, Treatise of Invertebrate Paleontology*. Marion became interested in the feeding mechanisms of cephalopods and published a series of papers on the radula and beaks of *Octopus vulgaris* from the 1960s. Her interest extended to their macrostructure, the proteins present in them, the tissues which secrete them, as well as longitudinal studies of the growth of the animal and of their radulae and beaks. Other cephalopods she studied included the cranchiid squid *Taonius megalops*, the oegopsid squid *Mastigoteuthis*, and the cirrate octopod *Cirrothauma*, as well as scanning electron micrographs of the suckers of 12 genera of cephalopods and their function in feeding. Her research on the radula and beak allowed her to compare the features of the buccal mass in living forms with those in fossil cephalopods; this was aided by her development of a formula for the teeth present in one horizontal row of the radular ribbon. Her knowledge across multiple taxa made her chapters on systematic characters of cephalopods so valuable in the 1988 CIAC workshop volume '*Larval and juvenile cephalopods: A manual for their identification*'. In the 1990s she and Katharina Mangold collaborated in studies of the lives and development, from hatching to death, of *Octopus vulgaris* and *Sepia officinalis*.

In 1974 J. Z. Young retired from the Anatomy Department of University College London and moved to the Wellcome Institute for the History of Medicine. Here he and Marion continued to study cephalopods and began '*The brains and lives of cephalopods*', which was published in 2003. In a review in the Journal of Plankton Research, Andrew Packard described the book as 'a scholarly and thoroughly readable treatise covering, soberly, genus by genus and brain by brain, senses and effectors, much of what is known about 125 of the 140 extant cephalopod genera. The achievement is a tribute to all concerned'. The book's publication six years after JZ's death is particularly a tribute to Marion's determination.

Her early involvement in cephalopod biology meant that Marion was present at the 'birth' of CIAC. She was no stranger to gatherings of cephalopod biologists having co-organized a meeting at the Zoological Society of London, and co-edited the published volume resulting from the meeting. From 1983 until 1988 Marion was Editor of the CIAC Newsletter; she contributed to the volumes resulting from the CIAC workshops held in Banyuls-sur-Mer, France, in 1975, and that from Washington, USA, in 1985. She also served on the CIAC Council from 1995–1997.

Latterly Marion contributed five chapters to *The University of Kansas Treatise of Invertebrate Paleontology*; she was also a sub-editor for some years. These chapters were published between 2010 and 2014, the last being on the buccal apparatus of living and fossil cephalopods. They were issued in separate parts as Part M, Treatise Online, and are due to be published in one volume, Part M, Coleoidea.

Joyce Wells (1930 – present)

- 1930 Born 14th October in Hitchin, Hertfordshire, UK.
 1935–1947 Attended Hitchin Girls Grammar School.
 1948–1951 Attended Cambridge University.
 1951–1953 Studied for PhD in Entomology (not completed due to her move to Naples)
 1958, 1961 Gave birth to Dominic and Simon respectively. Dominic is currently Professor in Translational Medicine at the Royal Veterinary College in London and Simon is a film director living in Los Angeles and working for Dreamworks.

Joyce Wells read Natural Sciences/Zoology at Newnham College, Cambridge, from 1948 to 1951, and was awarded the Edith Rigby Scholarship in 1951. She was a Research Student from 1951 to 1953, before going to work in the Stazione Zoologica together with her husband, Martin J. Wells, whom she had married in 1953.

Their first paper, 'Tactile discrimination and the behaviours of blind *Octopus*', was published in 1956 in the *Pubblicazioni Stazione Zoologica*, Naples. They published numerous other papers as a pair throughout their working life. Martin Wells wrote in the preface to his 1962 book '*Behaviour in cephalopods*' that 'I should like to thank Joyce Wells, my wife and also a zoologist, for allowing herself to be seduced away from research in entomology into working on cephalopods; a great deal of the work published under our joint names has been done by her, knowing quite well that as the wife of the senior author she would never get the credit she deserves for it.'

After their return to Cambridge, England in 1956 they continued to pursue their research in Naples during the summer months. In the 1970s they moved their summer base to the 'Laboratoire Arago,' the Marine Biological Station of Banyuls-sur-mer in southern France. In 1989, Martin and Joyce, went to Papua New Guinea to investigate the habits of *Nautilus*, which later, in a collaboration with Ron O'Dor, resulted in 'Life at low oxygen tensions: The behaviour and physiology of *Nautilus pompilius* and the biology of extinct forms' published in 1992 in the *Journal of the Marine Biological Association*, UK. Joyce held the Phyllis and Eileen Gibbs Travelling Research Fellowship in 1989.

On returning to Cambridge in 1956, Joyce supervised undergraduate students and demonstrated practical classes in Zoology. From 1967–1970 she was a tutor at Girton

College and she was appointed Senior Tutor at Newnham College in 1970 and held other administrative posts including serving on the Universities Central Council on Admissions committees until retiring in 1995. She remains Fellow Emerita.

Julia Arsent'evna Filippova (1934-present)

- 1934 Born 30th August in Moscow, Russia, USSR.
- 1952 Commenced study at Moscow State University, graduating in 1957.
- 1956 First research expedition: six months aboard the schooner *Nerpa* in the North Pacific.
- 1957 Took up her first research post in the benthic laboratory at the Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow.
- 1962 Research expedition aboard *RV Vityaz* to the Indian Ocean and Australia.
- 1965 Began postgraduate study at the All-Soviet Research Institute of Fishery and Oceanography (VNIRO), Moscow.
- 1976 PhD awarded by the Shirshov Institute of Oceanology, Moscow. Her thesis examined the systematics, distribution and ecology of ommastrephid squids.
- 2000 Helped organize the special Russian symposium in Aberdeen as part of CIAC 2000.
- 2011 Officially retired from VNIRO.

Julia Arsent'evna Filippova, honoured Russian cephalopod scientist, was born on 30th August, 1934, in Moscow, into a family of office workers. She showed a growing interest in biology throughout her childhood, and in 1952 entered the Biological Department of Moscow State University. She studied in the Department of Invertebrate Zoology under the guidance of the famous zoologist and hydrobiologist Professor LA Zenkevich and specialized in marine zoology. Julia made her first sea voyage in the summer of 1956, when she took part in a whaling expedition to the Bering Sea that was organized by the PP Shirshov Institute of Oceanology (Moscow). The expedition was carried out on a small whaling schooner *Nerpa* where living conditions were hard and fresh water was always limited. Working on *Nerpa* for six months, Julia ploughed the unsafe waters of the Bering Sea from Kamchatka to Alaska and from the Chuckchee Peninsula to the Aleutian Islands. At just 22 years of age, many might have found the hardships of such a long voyage testing, but Julia embraced the opportunity and collected data for her first scientific work as a student 'Zooplankton of the Commandor-Kamchatka region as a feeding ground for baleen whales'.

In 1957 Julia Filippova graduated from Moscow University and took a job in the benthic laboratory of the PP Shirshov Institute of Oceanology. In 1962 she participated in another long cruise aboard *RV Vityaz* to the Indian Ocean and Australian waters. During this cruise she met her future husband – a well-known zoologist and oceanologist Sergej Klumov with whom she lived in harmony for about 40 years before his death.

In 1965 she embarked upon postgraduate studies at the All-Soviet Research Institute of Fishery and Oceanography (VNIRO) in Moscow and started her life-long study of taxonomy, biology, and fisheries of cephalopods. She made a pioneering study of the teuthid fauna of Antarctic waters, and published 45 publications on zoogeography, systematics, morphology, ecology and fisheries of squids and cuttlefishes. In particular,

she described a new genus and four new species of squids from Antarctic waters and, together with Dmitrij Khromov, two new species of sepiids (Table 1). It's important to stress that these taxa except one are valid now. She also published two extensive manuals for execution of cephalopod biological analysis in 1972 and 1974. One of the most notable of Julia's publications is that which she co-authored with the famous teuthologist Igor Akimushkin: the chapter '*Class Cephalopoda*' for the very popular USSR multi-volume edition of '*Life of Animals*'. Her PhD thesis '*Systematics, distribution and ecology of the squids family Ommastrephidae*' (1976) became a significant landmark in the study of this important fishery group.

Julia Filippova investigated a wide range of problems in cephalopod biology and fisheries. But her most important and 'long-lived' papers are devoted to fauna, morphology, and especially systematics. No wonder that the outstanding teuthologist Kir Nesis said once: 'If the taxon was described by Julia – I believe in it 100%!'. However, life in an applied fishery institute constantly 'forced' Julia to engage in routine fishery problems and her pronounced talent for systematics, unfortunately, was not fully realized.

Her notable contribution to the study of cephalopods is reflected in the genus and species named in her honour (Table 2).

Working in VNIRO for almost her entire career, Julia Filippova became an original well-known scientist, an amicable person of high culture, good humour, and kind heart. She is a great storyteller and, in private conversation over a cup of tea, events and persons of the glorious past of Russian zoology and hydrobiology come to life, and familiar people and situations suddenly become new and interesting. She always shared her wealth of experience with her students and younger colleagues. Her pupils include such well-known teuthologists as Dimitrij Alexeyev, Vyacheslav Bizikov and Dmitrij Khromov. As the principal investigator driving these PhD studies, she showed a surprising ability to choose research themes that later proved to be highly perceptive. In 1997, in collaboration with her pupils and under her direction, Julia and colleagues published the book entitled '*Commercial and mass cephalopods of the World Ocean. A manual for identification.*'

Since the end of the 1960s Julia has worked on Antarctic squid biology in close collaboration with Valentin Jukhov (Odessa) a well-known researcher of Antarctic cetaceans, fish and squid. He was head of the scientific group in the whaling factory "*Sovetskaya Ukraina*" and participated in 16 Antarctic cruises during the 1960s and '70s. In these expeditions Valentin collected an enormous amount of squid material from the stomachs of sperm whales. Most of this material was studied by Julia and these data, together with large collections of Antarctic squid from trawls made during numerous Soviet research expeditions from the '60s to '80s allowed her to make generalizations on different aspects of Antarctic squid biology.

At present Julia Filippova is retired but she is preparing a monographic research on the morphology and ecology of squids of the Southern Ocean.

Eve Boucaud-Camou (1939-present)

1939 Born 11th December in Algiers, Algeria.

1961 Graduated with a BSc (*Licence*) in Natural Sciences in 1961, and in Zoology 1962, University of Algiers.

1962 Began post as Assistant Lecturer, University of Caen, France.

- 1967 Obtained her Masters (*DEA*) from University of Caen.
- 1968 Doctorat de troisième cycle, University of Caen, France. Her thesis was a histological and histochemical study of the digestive tracts of *Sepiola atlantica* and *Sepia officinalis*.
- 1970 Lecturer in Animal Biology, University of Caen.
- 1973 PhD (Doctorate Sciences Naturelles), University of Caen, France. Thesis examined the digestive tract of *Sepia* and the digestive processes.
- 1983 Professor of Zoology, University of Caen.
- 2001 Retired.

Eve Boucaud-Camou was born in Algeria and spent her early life there. She moved to France after graduating with degrees in Natural Science and Zoology. She obtained a post at the University of Caen as an assistant lecturer: a post that she held whilst completing her initial postgraduate studies. From 1970 onwards, she held a post as a full Lecturer. During this time, she also completed a PhD. During her doctoral studies Eve Boucaud-Camou was guided by Kathy Mangold-Wirz, who was also on her awarding jury. She says in the foreword of her thesis that she always received a warm welcome when visiting Kathy's laboratory.

After completing her doctoral studies, Eve began to build her own research group. During her career she supervised 11 theses at the University of Caen and was responsible for the 'cephalopod group' within the 'Laboratoire de Biologie et Biotechnologies Marines' at the University of Caen. She was promoted to Professor of Zoology in 1983, a post that she held until her retirement in 2001. She co-ordinated the work of, amongst others, three academics still active in diverse areas of cephalopod research: Jean-Paul Robin (ecology and population dynamics); Noussithé Koueta (juvenile digestive physiology and biochemistry); and Joël Henry (reproductive neuro-endocrinology and genomics). Furthermore she was involved in the ecotoxicological studies of *Sepia officinalis* by Paco Bustamante (currently Professor at the University of La Rochelle). Eve Boucaud-Camou has thus had a lasting effect on cephalopod biology beyond the contributions of her own research.

Dr Boucaud-Camou's personal research contributions were not small. She published over 80 papers and participated in as many as 60 meetings. She initiated and organised the *1st International Symposium on the cuttlefish Sepia*. This resulted in a multi-author volume published in 1991 entitled '*La seiche – The cuttlefish*'. This book had (and still has) a considerable impact on cuttlefish research. Eve collaborated with many other prominent cephalopod researchers during this time and was well connected in the cephalopod community, involved in European (EU) projects and International Council for the Exploration of the Sea (ICES) working groups. She was elected to the CIAC council between 1992–1997. In honour of her academic achievements, she was awarded the *Commandeur des Palmes Académiques*, the highest of three medals awarded to eminent academics in France.

Renata Boucher-Rodoni (1942 – present)

- 1942 Born in Domodossola, Italy.
- 1962 Began to study Biological Sciences in Switzerland.
- 1969 Graduated with a Diploma of Sciences from the University of Geneva, Switzerland.

- 1973 PhD, University of Geneva, Switzerland. Thesis examining feeding and digestion in *Eledone cirrhosa* and *Illex illecebrosus*.
- 1980 PhD, University of Orsay, France. Thesis examining the digestive gland during the life cycle of cephalopods.
- 1983 Researcher at CNRS in Roscoff, France.
- 1986 Commenced a post at the Museum National d'Histoire Naturelle, Paris, France.
- 2005 Retired.

Renata is a true European female scientist. Born in Italy, she began to study Science in Switzerland after a year studying interpreting at Geneva University. She obtained a diploma (Master's degree) on rainbow trout spermatogenesis. Her career in cephalopod science started with her PhD. Although she began her PhD in Switzerland (and it was awarded by the University of Geneva), it progressed most in Banyuls-sur-Mer under the supervision of Katharina Mangold who became her friend and remained so until Kathy's death. In 1973, Renata followed her husband, Guy Boucher, to Roscoff, France where he had obtained a position. Here, she began another PhD to, like Kathy, obtain a French PhD that would allow her to obtain appropriate research positions in France. She achieved this in 1980 and on her PhD awarding committee were both Eve Boucaud-Camou and Katharina Mangold.

Renata supported her research with Swiss grants until 1983 when she obtained a position in the CNRS as a researcher. She spent 17 years in Roscoff and developed expertise in cephalopod digestion and the digestive gland. Following her husband (once again), she arrived in Paris at the Museum National d'Histoire Naturelle in 1986.

Renata Boucher-Rodoni was always a step ahead of everybody else in her research. She had intuitions and did not hesitate in the face of scientific challenges. She was the first to embark on the molecular phylogeny of cephalopods and supervised Laure Bonnaud's PhD on Decabrachia phylogeny. Renata was the first to explore bacterial symbiosis in cephalopods and the transmission of bacteria populations to cephalopod eggs as well as processes of co-evolution. As early as 1990, she searched for mechanisms of CO₂/O₂ diffusion in eggs, research which is now of primary interest in the context of global change.

At the same time she worked actively in the museum collections and in systematics through her collaborative work with CC Lu, Mark Norman and Eric Hochberg. She contributed to ordering and clarifying the sepiid and octopod collections and produced a catalogue of d'Orbigny types.

Finally, she drove forward the restoration of a giant squid offered by Australia. It arrived in Paris in alcohol and was stored for several years until funds were obtained to prepare this specimen for the exhibition of the '*Grande Galerie de l'Évolution*'. Following all the latest developments in specimen preparation, Renata finally decided that 'plastination' would be best for this giant squid. Although the original suckers were eventually kept on the specimen, Renata kept 'metallic moulds' of suckers on her desk for several years that early on were going to be used in the project.

Renata is open minded, and interested in all aspects of science. But she was never recognized as much as she should have been. She never obtained the title of Research Director as she had hoped. She was told by the committee '*Votre mari a eu une promotion, vous comprenez bien que nous ne pouvons pas vous en donner une aussi*'. No comment.

She is now retired and navigates between Greece and Turkey for six months of the year.

Martina Compagno Roeleveld (1943–2006)

- 1943 Born 30th November in the Netherlands.
- 1967 Graduated with Honours in Zoology from Rhodes University.
- 1968 Appointed Curator of Marine Invertebrates, Iziko Museums of Cape Town: Natural History, South Africa.
- 1971 Graduated with a Masters degree from Stellenbosch University, subsequently published in 1972 as '*A review of the Sepiidae (Cephalopoda) of Southern Africa*' in the *Annals of the South African Museum*.
- 1981 Attended CIAC Charter Meeting in Plymouth, England.
- 1982 Published the first of an extensive series of papers on Ommastrephidae.
- 1983 Attended CIAC Charter Meeting in Banyuls-sur-Mer, France where she was appointed to the first CIAC council, 1983–1985.
- 1997 Helped organize the 1997 CIAC symposium in Capetown, South Africa.
- 2006 Died in Cape Town 30th June.

Martina Compagno Roeleveld studied cephalopods for the whole of her adult life. Her initial research focus was on Sepiidae, the subject of her Master's thesis. She broadened her outlook to encompass all cephalopods in South African waters, making serious efforts to document comprehensively the cephalopod fauna of her adopted country. She turned her attention then to squids and in particular ommastrephids, publishing detailed studies of taxonomically useful characters such as tentacular clubs and statoliths. Later she turned the same careful approach to the giant squid, *Architeuthis*, and it was her work on this subject which she considered to be some of her best. Martina had an almost 40 year long association with the South African Museum at Cape Town. Her study of *Architeuthis* tentacular structure resulted from the need for accurate data to construct a life-sized model for the museum. Characteristically, she drew broad conclusions from this research, interpreting her findings as evidence refuting a sluggish lifestyle for *Architeuthis*. Recent video evidence of giant squid in their natural habitat proves her right.

Martina was involved in many international studies. She published several papers on cephalopod beaks during her taxonomic studies, and she attended the cephalopod beak workshop in Plymouth, England in 1981 where the first CIAC charter meeting was held. At the subsequent charter meeting in Banyuls-sur-Mer she was elected to the first CIAC council. Martina played a long and active role in CIAC, contributing to numerous systematic workshops. She helped organize both the 1997 symposium in Cape Town '*Cephalopod Biodiversity, Ecology and Evolution*', coordinated the accompanying Workshop on Biodiversity of Southern African Cephalopods, and co-edited the conference proceedings.

Despite her involvement internationally, she never neglected her local environment. Together with a colleague she started the Friends organization at the South African Museum and acted as its inaugural Chair. And she took the study of her local waters extremely seriously, participating in numerous research cruises. In 1998, Martina published an update of her 1974 paper on South

African cephalopods, which more than doubled the number of cephalopod species reported earlier and provided extensive data on distribution and systematics.

In a career spanning more than 30 years, Martina published more than 50 papers and articles on cephalopods, many of which have become standard reference texts. Martina's untimely death, aged just 62, deprived the cephalopod community of one of its long-standing female role models.

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