

Historical Basis of Binomials Assigned to Helminths Collected on Scott's Last Antarctic Expedition

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ABSTRACT: Scientific investigations were a feature of Captain R. F. Scott's ill-fated expedition to the South Pole in 1910-1912. Among them was a study of parasitic worms in the coastal wildlife of Antarctica. It was the special project of Surgeon Edward L. Atkinson, whose scientific contributions, like his passion for high adventure, have largely been forgotten. The new parasitic species that he discovered were given names that were intended to honor the Expedition and many of its members. However, it was not then usual for new species descriptions to include an explanation of the proposed new binomials, and the significance of these particular names is not obvious to modern readers. This article examines the historical connection between the names of Atkinson's worms and the individuals and exploits commemorated by those names.

KEY WORDS: Antarctica, helminths, history, marine parasites.

One way or another, parasites and parasitologists have been a feature of several Arctic and Antarctic expeditions, and the association between poles and parasites is particularly strong in the case of Captain Scott's famous and fatal *Terra Nova* Expedition to the South Pole. The parasitological contribution of 2 medical members of that expedition, Dr. Edward A. Wilson and Dr. E. Leicester Atkinson, has been discussed elsewhere (Nelson, 1977; Campbell, 1988, 1991). Only passing mention, however, has been made of the new helminth species discovered by Atkinson in the course of his Expedition duties. It is the purpose of this article to examine the historical significance of the names conferred on these worms, which Atkinson brought with him when he sailed back to England with the widow of Edward Wilson. (Mrs. Scott and Mrs. Wilson had traveled to New Zealand to greet their returning husbands, unaware that neither man had survived the trek to the South Pole.)

Apart from a few worms (ascarids and heartworm) collected from Expedition dogs, the worms in Atkinson's collection were recovered from wildlife taken from the coastal waters of Antarctica or the temperate and tropical islands visited en route. The worms were collected in the period 1 July 1910 to 9 July 1912. Understandably, few dissections were carried out in the months between the demise of Scott and his Polar Party in March 1912 and the departure of the Expedition from Antarctica in January 1913, although Atkinson did undertake a 3-wk parasitological excursion during that time. The parasitological findings were recorded in 3 notebooks,

which are extant and have been described (Campbell, 1991). Parasites were examined microscopically, but apparently cursorily, in Antarctica and were preserved for later study.

Description of the parasites was subsequently carried out at the London School of Tropical Medicine, where Atkinson (who had been recently promoted to Staff Surgeon in the Royal Navy) worked under the tutelage of Robert T. Leiper. On 17 February 1914, Leiper and Atkinson gave a "lantern demonstration" of their helminth specimens at a meeting of the Zoological Society, and an account of the event was published in the same year (Leiper and Atkinson, 1914). The report consists of "diagnoses," or brief descriptions, of the new helminth species, but it does not include illustrations or incidental information. A more complete account was published in the following year (Leiper and Atkinson, 1915), but it, too, did not mention the origin or significance of the names assigned to the parasites.

Because most of the new taxa were named after members of Scott's *Terra Nova* Expedition (or their spouses), we could easily link most new binomials with the appropriate persons. These associations are discussed here on a systematic basis: the Digenca, Cestoda, Acanthocephala, and Nematoda. Atkinson's collection of worms included some species that had been described previously. Leiper and Atkinson (1915) tabulated these species together with species collected by earlier Antarctic expeditions, but these known species will not be considered here. The biographical information in the following notes has

been gleaned from many published accounts of the Expedition, but special reference should be made to Huxley (1978), Ponting (1923), Thomson (1977), and Quartermain (1981).

Digenea

Hemiurus oatesi (= *Elytrophalloides oatesi*) (Leiper and Atkinson, 1914)

This trematode species, from the fish *Trematomus bernacchii* (emerald notothen), also had been placed in *Parahemiurus*, *Plerurus*, and *Elytrophallus* before being established as the type species for the genus *Elytrophalloides*. It is named after Captain L. E. G. Oates of the Sixth Inniskilling Dragoons. As an Army man, he was an exception among the naval personnel of the *Terra Nova* Expedition. He had served heroically in the Boer War. He was devoted to horses and hounds and was responsible for the welfare of the ponies on the Expedition. To join the Expedition, "Titus" Oates had come from India and had contributed 1,000 pounds sterling. He is of special interest in the present context because he and Leicester Atkinson became close friends on the Expedition. On the return journey from the South Pole, Oates became incapacitated by frostbite. To enhance his companions' chances of survival, he left their encampment and walked to certain death in the surrounding snow. His heroic gesture proved futile, but Captain Oates is featured prominently in histories of the Expedition.

Aponurus bowersi (= *Genolinea bowersi*) (Leiper and Atkinson, 1914)

This trematode was collected from *Trematomus bernacchii*. *Genolinea leiperi* Byrd, 1963 (named for Robert Leiper) as well as other names are junior subjective synonyms of *G. bowersi*. The species is named after Lieutenant Henry Bowers of the Royal Indian Marine, who was 1 of the 2 companions (the other being Wilson) who died with Captain Scott at the final encampment. An intensely loyal and devoutly religious man, Bowers calmly awaited death, full of respect and admiration for Scott and confident that the party's demise was the work of divine providence. Bowers later became the subject of a biography written by Wilson's biographer, the Reverend George Seaver (Seaver, 1938).

Lepodora garrardi (= *Lepidapedon garrardi*) (Leiper and Atkinson, 1914)

This species was recovered from *Trematomus bernacchii* and is named after Mr. Apsley Cherry-

Garrard, Assistant Zoologist on the *Terra Nova* Expedition. He contributed 1,000 pounds sterling to join the Expedition and served as an unpaid member of the scientific staff. His much-lauded book, *The Worst Journey in the World*, includes an account of the "side trip" that he, Wilson, and Bowers made to Cape Crozier in the middle of winter (Cherry-Garrard, 1951). He commanded a squadron of armored cars on the Western Front in World War I until invalidated home. He subsequently lived a quiet and private life, becoming increasingly exasperated by what he perceived as a loss of moral fiber on the part of his countrymen, and being continually haunted by the realization that he could conceivably have saved the lives of the returning Polar Party (Thomson, 1977; Huxley, 1978). In February 1912, Atkinson, unable to leave base himself, had asked Cherry-Garrard to go south to One Ton Camp in the hope of meeting the returning Polar Party and escorting them back to base. Cherry-Garrard got there, with dogs and dog-driver Gerof, but even after a wait of several days no one else appeared. The supplies would have allowed them to push farther south for perhaps 20 mi, but it would have been useless. We know that 4 of the 5 members of the Polar Party were still alive at that time, but they were more than 70 mi away. Cherry-Garrard could have ventured even farther south if he had killed some of the dogs to feed the other dogs, but this would have been a violation of Scott's standing orders. An emergency might have justified the breaking of rules, but Cherry-Garrard perceived no emergency because the Polar Party would not be considered overdue for another 24 days. In any case, there was a strong possibility that Cherry-Garrard, in proceeding farther south, would miss the north-bound Polar Party and perish along with Gerof and the dogs. He lacked navigational skills, the weather was dangerously cold, the visibility was poor, and Gerof became seriously ill. Cherry-Garrard decided to return to base, and no one doubted the wisdom of that decision—except Cherry-Garrard.

Podocotyle pennelli (= *Macvicaria pennelli*) (Leiper and Atkinson, 1914)

This fluke, also, was taken from *Trematomus bernacchii*. The species was later transferred to the genus *Plagioporus* and then to *Macvicaria*. It is named after Lieutenant Harry L. L. Pennell, navigator of the *Terra Nova*. He was not a member of the Shore Party but had a crucially important position of leadership; it was his respon-

sibility to get the ship away from Antarctica before the winter freeze and to land and embark the various subsidiary parties. In World War I, during the Battle of Jutland, Pennell (who had been promoted to the rank of Commander) served on HMS *Queen Mary*, the newest and fastest battle cruiser in the Allied fleet. She was sunk by enemy shells during that famous battle, with the loss of all but 18 of her complement of 1,258 men. Pennell was not among the survivors.

***Allocreadium fowleri*
Leiper and Atkinson, 1914**

The immature specimens of this species were collected from *Trematomus bernacchii*. The name *Allocreadium fowleri* is considered a junior subjective synonym of *Macvicaria pennelli*. The Expedition roster did not include anyone named Fowler, and the significance of the original specific name is not known with certainty. According to Dr. David Gibson, of the Department of Zoology of the Natural History Museum in London, the name may refer to George Herbert Fowler, who was closely involved with material from the *Challenger* and *Discovery* expeditions.

Cestoda

***Oriana wilsoni* Leiper and Atkinson, 1914**

This tapeworm was collected by biologist D. G. Lillie from the rorqual whale *Balaenoptera borealis* (sei whale). The name is a junior synonym of *Tetrabothrius affinis*. *Oriana wilsoni* may or may not be named after Edward Wilson (after whom Shipley had named *Dibothriocephalus wilsoni* in 1907). If named after Wilson's wife and grammatically correct, the species should be *wilsonae*. The genus, however, is certainly named after Wilson's wife, Oriana Wilson née Souper. The 2 met while engaged in mission work in the London slums and were married 3 wk before Wilson sailed on Scott's first (*Discovery*) Antarctic expedition. Though severely shaken by the loss of her husband on the *Terra Nova* Expedition and by other family tragedies, she worked with the New Zealand Red Cross during World War I. She was made Commander of the British Empire in recognition of her outstanding service. She did not remarry and died in England in 1945, after a long illness.

***Dibothriocephalus lashleyi*
(=*Diphyllobothrium lashleyi*
(Leiper and Atkinson, 1914))**

This worm was recovered from a Weddell seal, *Leptonychotes weddelli*. It is named after Chief

Stoker William Lashly, who served under Scott in both the *Discovery* and *Terra Nova* expeditions. He was awarded the Albert Medal for gallantry in helping to save the life of Lieutenant Edward Evans (later Lord Mountevans) when the latter was stricken with scurvy during the polar journey. At the head of the Beardmore Glacier, Wilson (probably enquiring on behalf of Scott) asked Atkinson whom he would choose if an extra man were to be picked for the final polar assault. According to Huxley (1978), Atkinson's first choice was Lashly, followed by Thomas Crean. Scott, however, chose Bowers as the extra member of that ill-fated party. Like Atkinson, Lashly subsequently served in the Gallipoli Campaign during World War I, but he served at sea rather than on land. His ship, HMS *Irresistible*, was 1 of 3 battleships knocked out of action when the Allied fleet tried to storm the Dardanelles (a setback that had profound implications for the Allied cause). Most of the crew were taken off before the ship was sunk, and Lashly subsequently served on HMS *Amethyst*, surviving the war to become a customs officer in Wales. He died in 1940, and his diaries were published posthumously (Ellis, 1969).

***Dibothriocephalus archeri*
(=*Diphyllobothrium archeri*
(Leiper and Atkinson, 1914))**

This tapeworm was recovered from a Weddell seal, *Leptonychotes weddelli*. The name is a junior subjective synonym of *Diphyllobothrium wilsoni* (Shipley, 1907), as is *D. scotti* (Shipley, 1907). We think the parasite is named after Mr. W. W. Archer, Chief Steward on board the *Terra Nova*, who replaced Mr. Thomas Clissold as cook for the Shore Party when the *Terra Nova* returned to McMurdo Sound early in 1912. It is at first surprising that a species should have been named after someone who is not generally mentioned in accounts of the Expedition—one who had held a very "lowly" position in an expedition in which the sense of caste was deeply ingrained and one who had missed all the action. It is significant, however, that Archer had served in Antarctica under the command of Atkinson, who had done so much to break down the barriers of caste and who had gained the respect of all ranks in the dark winter days following the loss of the Polar Party. It is perhaps of special significance that Archer had accompanied Atkinson and Cherry-Gerrard (2 distinguished "upper-class" members of the Expedition) on a 3-wk parasitological excursion in December 1912. Apparently, Archer

had impressed Atkinson in some way that we shall never know but that led to Atkinson's commemoration of Archer in the name of a new species.

***Diphyllobothrium rufum*
Leiper and Atkinson, 1914**

This tapeworm was found in a specimen of the Weddell seal, *Leptonychotes weddelli*. Its specific name refers to the brick-red pigmentation around the base of the living worm's suckers. Of the 19 taxa that the authors named in their report, it is only 1 of 2 that were not patronymics or named after the Expedition vessel.

***Tetrabothrius wrighti*
Leiper and Atkinson, 1914**

This tapeworm was found in *Pygoscelis adeliae*, the Adélie, or black-throated penguin. It was named after Charles (later Sir Charles) Wright, physicist and glaciologist on the *Terra Nova* Expedition. As a member of one of the supporting sledging parties, Wright helped to haul a sledge almost to the top of the Beardmore Glacier before being ordered to return to base camp. He learned navigation on the Expedition and put this knowledge to good use when serving as a member of Atkinson's Search Party, which found Scott's last encampment in November 1912. He subsequently served as a radio officer in World War I, winning both the Military Cross and the Legion of Honour. Until his retirement at the end of World War II, Wright served in various distinguished scientific positions in the Admiralty. When he died in 1977, he left Trygve Gran as the last survivor of the Expedition.

***Anthobothrius wyatti*
Leiper and Atkinson, 1914**

This tapeworm was recovered from *Trematodus bernacchii*. It is presently considered a junior synonym of *Orymatobothrium versatile*. We think it was named after Mr. George Wyatt, who was not a member of the *Terra Nova* Expedition but who was its business manager. Scott's preparations for the Expedition were handled, at least nominally, by a small business staff with offices in London. In fact, Scott delegated little responsibility to others.

***Tetrabothrius creani* Leiper and Atkinson, 1914**

This parasite was found in the herald petrel, *Pterodroma arminjoniana* (reported as *Oestrelata trinitatis* and *O. arminjoniana*). It was named

after Thomas Crean, an Irishman of the "wild" variety who had served with Scott on both the *Discovery* and *Terra Nova* expeditions and indeed during the interim. A noncommissioned officer, he had to drop out of the depot-laying journey (February 1911) to take care of Surgeon-Lieutenant Atkinson, who was unable to continue because of a chafed and infected heel. He survived moments of great danger on the breaking sea-ice of McMurdo Sound and was one of those who traveled farthest with the main Southern Party. He and fellow Petty Officer Lashly reportedly shed tears of disappointment when, having struggled to within 169 statute mi of the South Pole, they were sent back to base camp. Thus, with Lashly and Lieutenant Edward Evans, he was a member of the last Supporting Party, the 3 men who were sent back on 4 January 1912 and who almost met a fate similar to that of the 5 men who continued to the Pole itself. When Lieutenant Evans collapsed with scurvy on the homeward journey, Lashly stayed with him. Crean, having already trudged 1,500 mi on foot, hauling a sledge most of the way, now walked 35 mi in 18 hr, with no camp equipment to save him in the event of a blizzard, and reached base camp half an hour before a blizzard came down. Atkinson was thereby alerted in time to go to the rescue of Evans. For this exploit, Crean was awarded the Albert Medal for gallantry. On return from the Expedition, Crean gave up his Navy pension to join Shackleton's *Endurance* Expedition, and he was a member of the small party that accomplished the incredible rescue mission that became that Expedition's chief claim to fame. He got back in time to serve in the War for 1 yr before retiring to the South Pole Inn in the village of Anascaul in Ireland.

***Tetrabothrius aichesoni*
Leiper and Atkinson, 1914**

This tapeworm was collected from the petrel *Pterodroma arminjoniana* (reported as *Oestrelata trinitatis*). Its name is a junior synonym of *T. creani*. According to Ms. Adrienne Reynolds, a British authority on Atkinson, "Aicheson" is an old variant of Atkinson's family name. It is extremely unlikely that Atkinson would have named the species after himself, but he may have been trying to honor his family. It is also conceivable that Leiper would have wished to name a species after his colleague and that Atkinson would accept only an indirect and obscure form of recognition. Atkinson was described by one

who knew him well as "almost pathologically modest" (Cherry-Garrard, 1951).

Tetrabothrius catherinae
Leiper and Atkinson, 1914

This tapeworm, also, was recovered from the petrel *Pterodroma arminjoniana* (reported as *Oestrelata trinitatis*). The name is a junior synonym of *T. creani*. The species was probably named after Atkinson's aunt, Catherine Leycester (=Leicester) Atkinson, later Lady Nicholson of Banff, Scotland. As a schoolboy, Atkinson spent some of his vacations in her home because his parents were living in the West Indies (A. Reynolds, 1988, unpubl. letter to W. C. Campbell).

Tetrabothrius priestleyi
Leiper and Atkinson, 1914

This tapeworm was reported from the frigate bird *Fregata aquila* or *F. ariel* and is presently considered a junior synonym of *Tetrabothrius pelecani*. It was named after Raymond (later Sir Raymond) E. Priestley, geologist on Shackleton's *Nimrod* Expedition and Scott's *Terra Nova* Expedition. He was a member of the Eastern (originally Northern) Party, which almost perished when they had to spend the winter months in an ice cave far from base camp. He served in the Signal Corps during World War I and subsequently held distinguished academic positions. Each of his 2 sisters married other members of the *Terra Nova* Expedition (Griffith Taylor and Charles Wright).

Tetrabothrius nelsoni
Leiper and Atkinson, 1914

This parasite was collected from the light-mantled sooty albatross, *Phoebastria palpebrata*, and was named after Edward W. Nelson, biologist on the Expedition. Nelson was rich and urbane, and Scott thought him lazy and superficial. He had little impact on the Expedition, but was 1 of the dozen men who passed the second winter under Atkinson's command.

Acanthocephala
Echinorhynchus campbelli
(=*Metacanthocephalus campbelli*)
(Leiper and Atkinson, 1914)

This acanthocephalan species has been transferred to *Leptorhynchoides*, then to *Metechinorhynchus*, and finally to *Metacanthocephalus*. It was found in *Trematodus bernacchi* and was

named after Lieutenant Victor L. A. Campbell, one of the Navy officers on the *Terra Nova* Expedition and Commander of the Eastern Party (originally Northern Party). The survival of this party, sheltering for 7 winter months in an ice cave and returning unaided to base camp, was largely attributed to his leadership and courage. In World War I, Campbell served in the Gallipoli Campaign and won the Distinguished Service Order.

Echinorhynchus rennicki
(=*Leptorhynchoides rennicki*)
(Leiper and Atkinson, 1914)

This spiny-headed worm also infected *Trematodus bernacchi*. Its name, however, is now considered a junior synonym of *Metacanthocephalus campbelli*. The name *rennicki* was in honor of Lieutenant Henry Rennick, who was the hydrographic expert on board the *Terra Nova*. Not members of the Shore Party, he and Pennell were in charge of the ship while Captain Scott was on shore. Rennick died when his ship, HMS *Hogue*, was sunk during World War I.

Echinorhynchus debenhami
Leiper and Atkinson, 1914

This worm, too, was found in the fish *Trematodus bernacchi*. The original name is considered more appropriate than *Leptorhynchoides debenhami*, a synonym that also occurs in the literature. The species was named in honor of Frank Debenham, an Australian-born geologist on the *Terra Nova* Expedition and a member of the Eastern Party. He served in the Infantry in World War I and later became the first professor of geography at Cambridge University. He was a co-founder and first director of the Scott Polar Research Institute.

Nematoda

***Kathleena scotti* (= *Contracecum scotti*)**
(Leiper and Atkinson, 1914)

This roundworm was found in *Diomedea melanophrys*, the mollymauk, or black-browed albatross. The generic name *Kathleena* is now a junior synonym of *Contracecum*. Because of the masculine, rather than feminine or plural, Latin ending in *scotti*, we must assume that the trivial name honors R. F. Scott and not also Kathleen.

The genus is named in honor of Kathleen Bruce Scott. A talented sculptor, the young Kathleen Bruce lived for a time in Paris, where she studied,

informally at least, under Rodin. She subsequently returned to England, where she married Scott in 1908 and gave birth to their son just over a year later. (That son, the late Sir Peter Scott, was the celebrated wildlife artist, naval officer, wildfowl conservationist, Olympic yachtsman, and champion glider-pilot.) Kathleen's artistic background and high-spirited personality were in marked contrast to her husband's conventional discipline and introspection. She did not learn of his death until 11 mo after the event. As the widow of a national hero who would have been knighted, she was dubbed Lady Scott. She had a special friendship with the explorer Nansen, who tried unsuccessfully to persuade her to marry him. Through her sculpture and her social connections, she attained a fulgent but ephemeral fame. Lady Scott worked in a munitions factory in World War I and subsequently married a politician, E. H. Young (the couple later becoming Lord and Lady Kennet).

Robert Falcon Scott, leader of 2 prominent Antarctic expeditions, has been the subject of numerous books and articles and is sufficiently well known to require little comment here. His final (*Terra Nova*) expedition ended in disaster but became the most famous of all Polar expeditions. Among the 5 members who died on the return journey from the South Pole were 4 (Wilson, Oates, Bowers, Scott) after whom helminth species were named. Scott and Wilson had also been twice honored in this way, their names having previously been given to tapeworms collected on Scott's *Discovery* Expedition (*Dibothriocephalus scotti* Shipley, 1907, and *D. wilsoni* Shipley, 1907).

Crassicauda Leiper and Atkinson, 1914

Leiper and Atkinson (1914) erected the generic name *Crassicauda* for *Filaria crassicauda* Creplin, 1829, for specimens that occurred in renal tubules of the hump-backed whale. The name, in apposition to the species group name and also like the cestode *Diphyllobothrium rufum*, is descriptive in nature rather than a patronymic or named after the Expedition vessel.

Terranova antarctica

Leiper and Atkinson, 1914

This ascaridoid nematode was collected from a shark, and its specific name refers to the Expedition's destination. The generic name refers to the commercial whaling ship *Terra Nova*, which Scott bought for his second Antarctic ex-

pedition. It was barque-rigged, renovated, and fitted out under the command of Lieutenant Edward R. G. R. Evans, whose name, together with that of Petty Officer Edgar Evans, is conspicuously absent from these helminth names (Campbell, 1991). In theory, the *Terra Nova* was a sailing ship with auxiliary steam power; in practice, she was a steamship with auxiliary sail.

Other Antarctic Names

The purpose of this article is to treat those helminths described by Leiper and Atkinson that pay recognition to people involved in many capacities in the *Terra Nova* Expedition. As already indicated, other helminths such as *Dibothriocephalus wilsoni* Shipley, 1907, and its junior synonym *D. scotti* Shipley, 1907, are also named after some of the same people. The same can be said of some fishes in the Antarctic region such as the nototheniids *Trematomus scotti* (Boulenger, 1907) (blackfin notothen) and *T. penellii* Regan, 1914 (sharp-spined notothen), the channichthyids *Chionodraco kathleenae* Regan, 1914 (a synonym of *C. hamatus*), and *Chaenodraco wilsoni* Regan, 1914 (spiny icefish), and the artedidraconid *Artedidracon orianae* Regan, 1914 (plunderfish). Scientists apparently shared with others a deep interest in Scott's ill-fated expedition and used the naming of new species as a means of honoring many of the individuals associated with it.

Acknowledgments

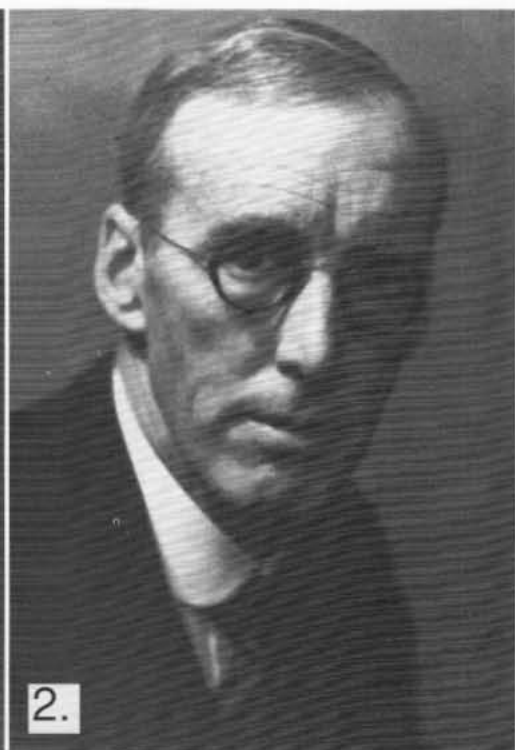
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Figures 1-4. Historical links between helminthology and Scott's Antarctic expedition. 1. E. L. Atkinson. 2. R. T. Leiper. 3. L. E. G. Oates. 4. H. R. Bowers.



Figures 5-8. Historical links, continued. 5. A. Cherry-Garrard. 6. H. L. L. Pennell. 7. H. E. de P. Rennick. 8. S. W. Lashly.



Figures 9-12. Historical links, continued. 9. F. Debenham. 10. T. G. Taylor. 11. C. S. Wright. 12. T. Green. ^{Crean}



Figures 13-16. Historical links, continued. 13. K. Scott and son. 14. The *Terra Nova*. 15. O. Wilson. 16. R. F. Scott.