Trends in
Parasitology

CellPress

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What's in a name? Discovering *Leishmania*

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2 June 2026 marked the centenary of the death of Sir William Boog Leishman, the Scottish physician after whom *Leishmania* was named. However, he was not the first to describe the parasite. In this article, we recount this discovery and explain the etymological conventions that ensured Leishman's name was preserved in scientific history.

Preface

This work was conceived during an excursion to Sir William Boog Leishman's country home in Blairmore, western Scotland, following the British Society of Parasitology meeting in Glasgow in April 2026. Note: as only a limited number of references are allowed, we apologise to the authors of seminal papers not cited and refer readers to several historical papers on this topic [1,2].

Historical notes on leishmaniasis

Leishmaniasis, in multiple clinical manifestations, has been known to humankind for millennia. PCR analysis of Egyptian mummies from a Middle Kingdom tomb (2050–1650 BCE) in Thebes revealed the presence of *Leishmania donovani* (a causative agent of visceral leishmaniasis, VL). Similarly, 'Nile pimple', presumed to be cutaneous leishmaniasis (CL), is described in the Ebers Papyrus (c. BCE 1550, likely copied from earlier Egyptian texts). *Leishmania* sp.-infected macrophages were documented in a Peruvian mummy dated circa 800 BCE, and Latin American pottery from this period portrayed human faces with traits resembling CL and mucocutaneous leishmaniasis (MCL).

The first medically accurate description of CL ('Balkh sore', 'Aleppo boil', 'Sart ulcer', 'Pendeh sore', and various other names) is credited to Avicenna (Ibn Sina, CE 980–1037) in his book *Alkanun Fi El-Tebb,* which was published in CE 1037. These persistent skin lesions were notoriously slow to heal and became known locally as 'Al Okht' ('the little sister'). The first record of CL in English was published in 1756 by the Scottish physician Alexander Russell (1715–1768). Among the first accounts of MCL was Pedro Pizarro's (1515–1602), included in his book 'Relation of the Discovery and Conquest of the Kingdoms of Peru', published in 1571. Regarding VL, one of the earliest accounts of the disease ('kala-azar', black fever in reference to skin darkening in some patients, where 'kala' comes from Hindi for 'black' and 'azar' comes from Persian for 'disease') was from William Twining (1790–1835), who described enlarged spleen, acute anaemia, and irregular fever in patients in Bengal, India, in 1827. Another variant of kala-azar manifests in the form of skin eruptions appearing long after the clinical cure. Sir Upendranath Brahmachari (1873–1946) recognised this distinct clinical outcome and coined the term post-kala-azar dermal leishmaniasis [3].

The discovery of *Leishmania*

So much for the disease. The discovery and naming of its causative agent, however, has been the subject of some controversy. The first report of microorganisms, other than bacteria, in 'Delhi boil' (now known to be CL) lesions is attributed to David Douglas Cunningham (1843–1914), a Scottish doctor working in Calcutta (now Kolkata), who documented parasites infecting host macrophages but misinterpreted them as developing 'spores' [4] (Figure 1), an error perpetuated in 1891 by Sir Robert Hammill Firth (1857–1931), who classified them as Sporozoa.

In 1898, Pyotr Fokich Borovsky (1863–1932), a Russian–Ukrainian surgeon and microbiologist, noted bodies in material from a 'Sart sore' patient in Tashkent (in today's Uzbekistan) and classified them as Protozoa [5] (Figure 1). It is now generally accepted that Borovsky's descriptions were the first accurate depictions of the parasites, although widespread recognition of this fact awaited the translation of his work into English [2]. A prominent Russian parasitologist, Leonid M. Isaev (1886–1964), proposed that *Leishmania* be renamed *Borowskia* [10], but to no avail. The name *Borovskyia* did eventually reach the scientific nomenclature, being assigned to a lineage of monoxenous trypanosomatids, which represent the closest phylogenetic relatives of *Leishmania* [11].

Given Borovsky's description, why did the name *Leishmania* prevail? It is not simply that Borovsky's original paper was published in a relatively obscure Russian-language journal, but also because of the need to follow conventions governing zoological nomenclature. The International Commission on Zoological Nomenclature (ICZN) was founded in 1895 with the remit of creating a stable and consistent system for naming animals (including protists). The convention the ICZN went on to adopt consisted of using the binomial nomenclature system established by Linnaeus in 1758, with the first available, validly published Latinised scientific name generally taking precedence. On 28 November 1903, Sir Ronald Ross (1857–1932), the Nobel laureate credited with discovering *Anopheles* mosquitoes as the vector of malaria, published a short paper in the *British Medical Journal* (BMJ) in which he coined the scientific name *Leishmania donovani* [6]. Borovsky did not publish a Latinised binomial name

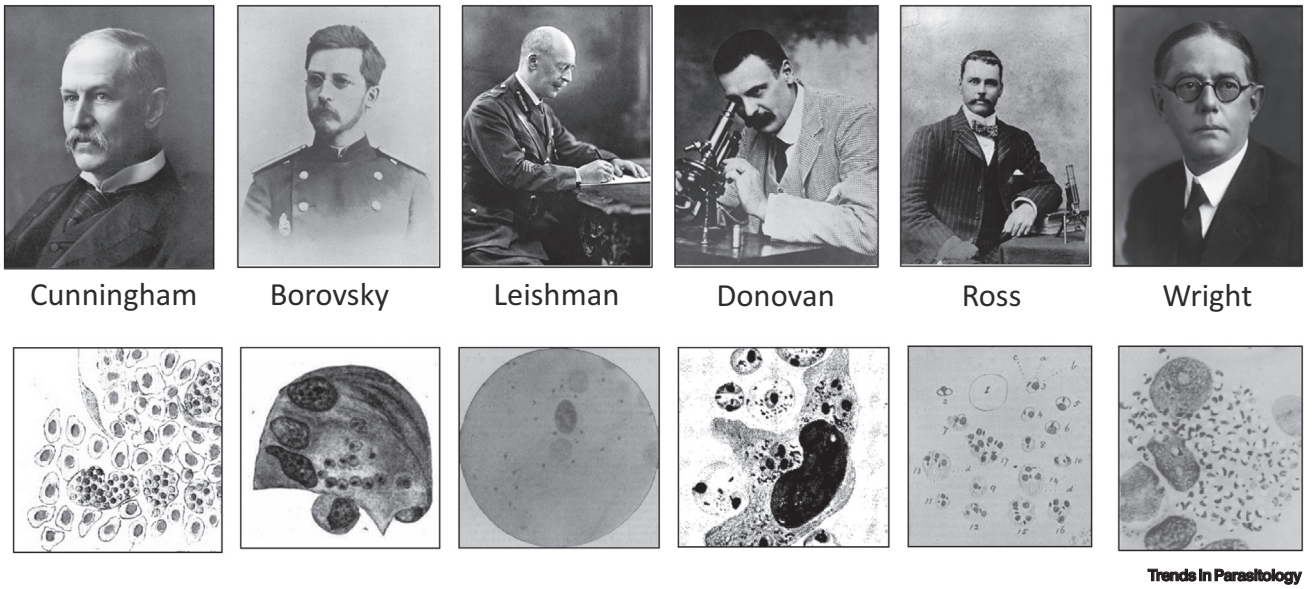


Figure 1. Scientists involved in the discovery of *Leishmania* (top) and their drawings or microscopy images of the parasites (bottom; the drawing or miscroscopy images below each portrait is from that individual). Publications from which these drawings were taken are cited in the text [4–9].

in his paper. Thus, we use the genus *Leishmania* Ross, 1903, and the disease caused by members of this genus came to be known as leishmaniasis.

Controversies

But why did Ross choose *Leishmania*? Sir William Boog Leishman (1865–1926) was a graduate of the University of Glasgow before serving in the Army Medical Service. He was posted to India, where he spent some time at the Dum Dum garrison and armoury near Calcutta. There, many soldiers presented with a febrile illness that became known as 'Dum Dum fever' because of its local prevalence. It was suspected to be related to kala-azar. The cause of kala-azar was unknown, although its severity made it a major concern for the authorities. Doctors, including Leonard Rogers (1868–1962) and later, in 1898, Ronald Ross himself, were dispatched to investigate. Despite the absence of *Plasmodium*, the intermittent rather than periodic fever, splenomegaly, and failure of quinine treatment, both men regarded kala-azar as a severe and atypical form of malaria, as did many doctors at the time.

Meanwhile, Leishman returned to Britain and took up a post in pathology at the Army Medical School. There, in 1900, using a modified and improved variation of Romanowsky's staining technique, he identified small intracellular bodies in the spleen of a deceased soldier (private JB of the 2nd Royal Irish Rifles Regiment), who had died of Dum Dum fever after returning to Britain. These parasites contained two highly distinctive stained structures, now known to be the nucleus and the kinetoplast (Figure 1). Three years elapsed before Leishman published these findings in the BMJ on 11 May 1903 in a paper entitled 'On the possibility of the occurrence of trypanosomiasis in India' [7]. The two stained structures he had noted resembled similar entities seen in trypanosomes and, having seen similar bodies in a laboratory rat that had died from trypanosome infection in 1902, Leishman believed they were degenerate trypanosomes.

On 17 June 1903, Charles Donovan (1863–1951), an Irish officer of the Indian Medical Service in Madras (now Chennai), documented the presence of similar bodies in splenic biopsy tissue and blood from a living 12-year-old boy displaying symptoms of kala-azar. Donovan correctly identified the Leishman bodies as the aetiological agents of kala-azar and published a brief letter outlining his findings in the BMJ on 11 July 1903 [8] (Figure 1). Donovan used Leishman's title to draw attention to the fact that he did not consider the bodies to be degenerate trypanosomes, implying a new parasite. This immediately stirred questions of priority, even though neither Leishman nor Donovan had described the species using a Latinised binominal name, as had also been the case for Borovsky. In September 1903, Donovan sent some of his original slides to Ross in Liverpool and to Charles Louis Alphonse Laveran (1845–1922) and Félix Mesnil (1868–1938) at the Pasteur Institute in Paris. The French scientists mistakenly identified the protozoan as a member of the taxonomic order today known as the Piroplasmida (phylum Apicomplexa) and gave it the scientific name *Piroplasma donovani* [12]. Upon receipt of Donovan's

letter, Ross recognised the similarity between the observed bodies described by Leishman and Donovan and published his opinion in the BMJ on 14 November 1903. He used the term Leishman–Donovan body in an effort to give credit to both scientists [13]. The Leishman–Donovan body, however, is not a Latinised binomial term. A couple of weeks later, in the November 28th edition of the BMJ, Ross followed up with a second short paper apologising for not having noted Leishman's original observation published 3 years earlier in 1900, reiterating his belief that the parasites were not trypanosomes, and crucially offering the Latinised binominal name *Leishmania donovani* [6] (Figure 1). He thus offered *Leishmania* as a new genus name while retaining the species name proposed by Laveran and, in doing so, crediting both investigators. Importantly, the BMJ was a weekly publication with a fast turnaround time. This was not the case for other journals. The American pathologist James Homer Wright (1869–1928) published his thorough description of the parasites he had found in a specimen of tropical ulcer 'Delhi sore' from an Armenian girl in the *Journal of Medical Research* in December 1903 and named the parasite *Helcosoma tropicum* [9] (Figure 1). This parasite was later renamed *Leishmania tropica*, as Ross's genus name published on 28 November 1903, took precedence under the nomenclatural convention. Remarkably, the margin of priority may have been as little as 3 days, as the day of publication of the December 1903 issue of the *Journal of Medical Research* is not included in the citation, but may have been 1 December 1903.

Concluding remarks on nomenclature

Ross was famously sensitive regarding credit for scientific discoveries. His public disagreements with Italian investigators Grassi, Bignami, and Bastianelli over the proof of mosquito transmission of malaria are legendary. Sir Patrick Manson (1844–1922), 'the Father of Tropical Medicine', was also anxious to bag British priority, for example, urging Ross to secure priority over continental rivals in his malaria transmission work, warning in 1895 that French and Italian researchers might 'pooh-pooh it at first, then adopt it, and then claim it as their own'. Similar disputes arose elsewhere, for example, between Scotsman Sir David Bruce (1855–1931) and Italian Aldo Luigi Mario Castellani (1874–1971) over the causative agent of sleeping sickness (*Trypanosoma brucei*), despite the fact that trypanosomes had been documented prior to the published reports of Bruce or Castellani [14]. It seems plausible that in the case of *Leishmania*, Ross was stung into action by anxiety that Laveran and Mesnil might be credited with naming the parasite, leaving Leishman's contribution unrecognised.

Under the ICZN rules, scientific names must be Latinised and consist of a genus and species epithet, but their content is otherwise at the discretion of the author. This system itself has recently run into a controversy as it represents a Eurocentrism that stems from the colonial era and would seem potentially unfair in a world of multiple languages and cultures, although—by the same token—there must be a globally agreed system and, given that the system did stem from Europe, the case for priority acceptance seems compelling [15]. Genus names may honour individuals [e.g., *Leishmania* discussed here, *Giardia* (after Giard), *Theileria* (after Theiler)] or describe morphology [e.g., *Trypanosoma* ('screw-bodied'), *Schistosoma* ('split-bodied'), and *Plasmodium* ('little-bodied')] or other characters. Likewise, species names can honour people (e.g., *donovani*, *mansoni*, and *brucei*), places (e.g., *gambiense* and *japonicum*), physiological traits (e.g., *vivax*), host species (e.g., *bovis* and *equiperdum*), disease symptoms (e.g., *ulcerans*), and so on. Irrespective of this, once validly established, names are generally fixed and can only be changed under limited conditions. This rigidity has implications for names now considered problematic. For instance, there have been calls to reconsider *Trypanosoma brucei rhodesiense*, named after Rhodesia (now Zimbabwe), itself derived from the British colonialist Cecil Rhodes. However, ICZN rules make such changes difficult unless formal taxonomic justification exists, and hence the beetle *Anophthalmus hitleri*, the wasp *Entedononecremnus stalini*, and the moth *Neopalpa donaldtrumpi* are all considered valid names.

For now, therefore, given Ross's dash to post his nomenclature in the *British Medical Journal* of 28 November 1903, the genus *Leishmania* will stick, irrespective of discoveries by others prior to that time.

Acknowledgements

We thank Dr Mahmudova (Isaev's Research Institute of Parasitology, Samarkand) for access to historical materials related to Borovsky's research. This work was supported by the European Regional Development Funds (project 'Centre for Research of Pathogenicity and Virulence of Parasites' CZ.02.1.01/16_019/0000759 to V.Y.). S.R. acknowledges financial support provided through the Indian National Science Academy (INSA) Senior Scientist Fellowship (INSA/SP/SS/2024) awarded by the INSA.

Declaration of interests

The authors declare no competing interests.

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https://doi.org/10.1016/j.pt.2026.08.007

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References

1. Steverding, D. (2017) The history of leishmaniasis. *Parasit. Vectors* 10, 82
2. Hoare, C.A. (1938) Early discoveries regarding the parasite of Oriental sore (with an English translation of the memoir by P. F. Borovsky: "On Sart sore." 1898). *Trans. R. Soc. Trop. Med. Hyg.* 32, 67–92
3. Brahmachari, U.N. (1922) A new form of cutaneous leishmaniasis—dermal leishmanoid. *Ind. Med. Gaz.* 57, 125–127
4. Cunningham, D.D. (1885) On the presence of peculiar parasitic organisms in the tissue of a specimen of Delhi boil. *Sci. Mem. Med. Off. Army India* 1, 21–31
5. Borovsky, P.F. (1898) On Sart sore. *Rus. Mil. Med. J.* CXCV, 925–941 (in Russian)
6. Ross, R. (1903) Further notes on Leishman's bodies. *Br. Med. J.* 2, 1401
7. Leishman, W.B. (1903) On the possibility of the occurence of trypanosomiasis in India. *Br. Med. J.* 1, 1252–1254
8. Donovan, C. (1903) On the possibility of the occurrence of trypanosomiasis in India. *Br. Med. J.* 2, 79
9. Wright, J.H. (1903) Protozoa in a case of tropical ulcer ("Delhi sore"). *J. Med. Res.* 10, 472–482
10. Isaev, L.M. (1933) P.F. Borovsky and the discovery of the causitive agent of cutaneous leishmaniasis. *Med. Parazitol. (Mosk.)* 1, 277–280 (in Russian)
11. Kostygov, A.Y. and Yurchenko, V. (2017) Revised classification of the subfamily Leishmaniinae (Trypanosomatidae). *Folia Parasitol.* 64, 020
12. Laveran, C.L.A. (1903) Note sur les corps trouvés dans le Kala-azar. *Bull. Acad. Med.* 50, 238–240 (in French)
13. Ross, R. (1903) Note on the bodies recently described by Leishman and Donovan. *Br. Med. J.* 2, 1261–1262
14. Steverding, D. (2008) The history of African trypanosomiasis. *Parasit. Vectors* 1, 3
15. Jiménez-Mejías, P. *et al.* (2024) Protecting stable biological nomenclatural systems enables universal communication: a collective international appeal. *Bioscience* 74, 467–472