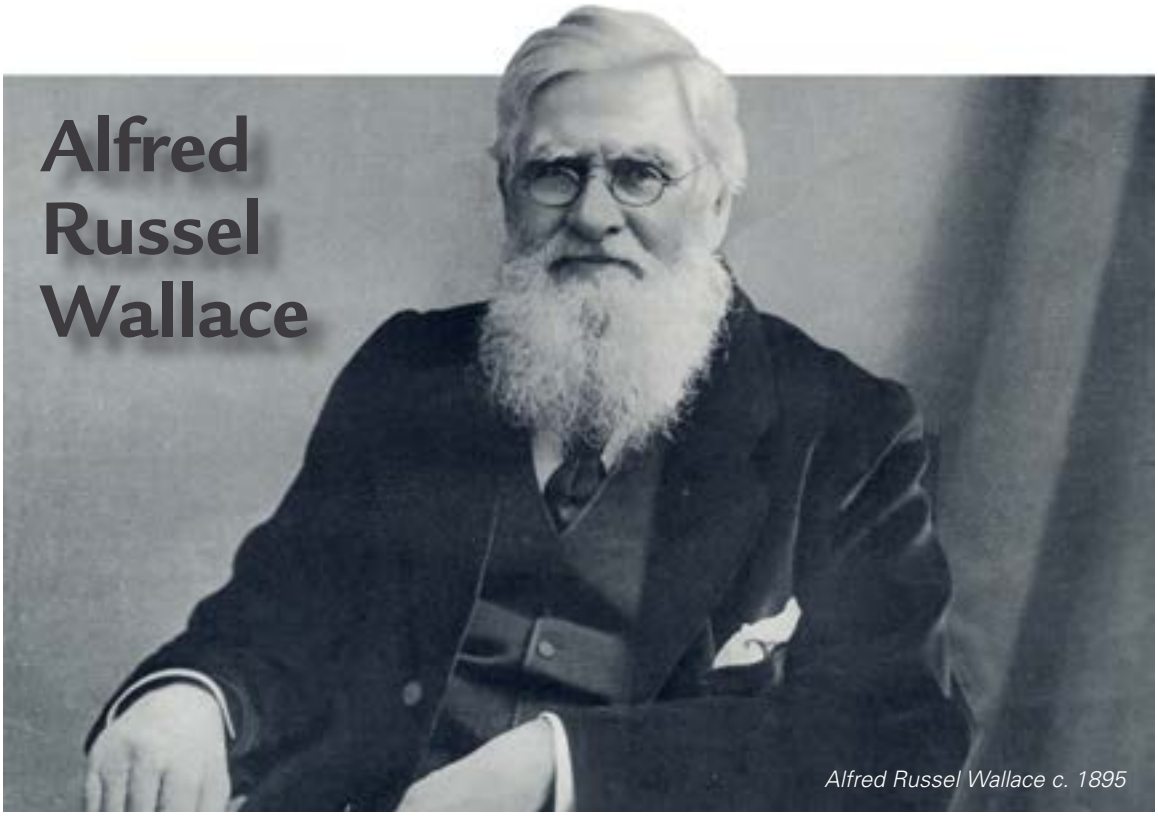
Alfred Russel Wallace

James Williams



Alfred Russel Wallace c. 1895

Alfred Russel Wallace (1823–1913) isn't a name many people know. As a scientist he was interested in lots of different things, from how different species came into existence to the question of whether ghosts really do exist. His greatest achievement was to come up with a theory of evolution suggesting that natural selection was how new species came into being. The theory of evolution is usually just credited to another great naturalist – Charles Darwin. The intriguing thing is that it was Wallace who sent his own theory of evolution to Charles Darwin asking if it was good enough to be published.

Young Wallace

Wallace was born on the 8th January 1823 at Kensington Cottage near Usk, Wales. He was the eighth of nine children.

When Wallace was five, his family moved to Hertford where he attended the local Grammar School. He was taught arithmetic, algebra, English grammar, geography, French and classics – but no science. Science in those days was not a subject studied in schools.

He left school at the age of 13 and joined one of his brothers, William, a surveyor. When work was scarce, Wallace practised his surveying skills (good training for fieldwork as a scientist). He wandered the countryside and, using a botany book, learned to identify many of the common plants he found.

For a while he taught at Leicester Collegiate School. Here he met another naturalist, Henry Walter Bates (1825–1892) and the two men became good friends.

In search of the Origin of Species

Using money saved from various work projects Wallace, with Bates, travelled to the Amazon. Unlike Charles Darwin, Wallace set out with the idea of coming up with a theory about the origin of species. During his travels he collected specimens of many new species. He also produced the first detailed map of the Rio Negro.

The trip lasted four years, but ended in tragedy. Wallace's younger brother, Herbert, had travelled to the Amazon to become a collector. Soon after arriving, he contracted yellow fever and died. Wallace was heartbroken and decided to pack his collection and head home.

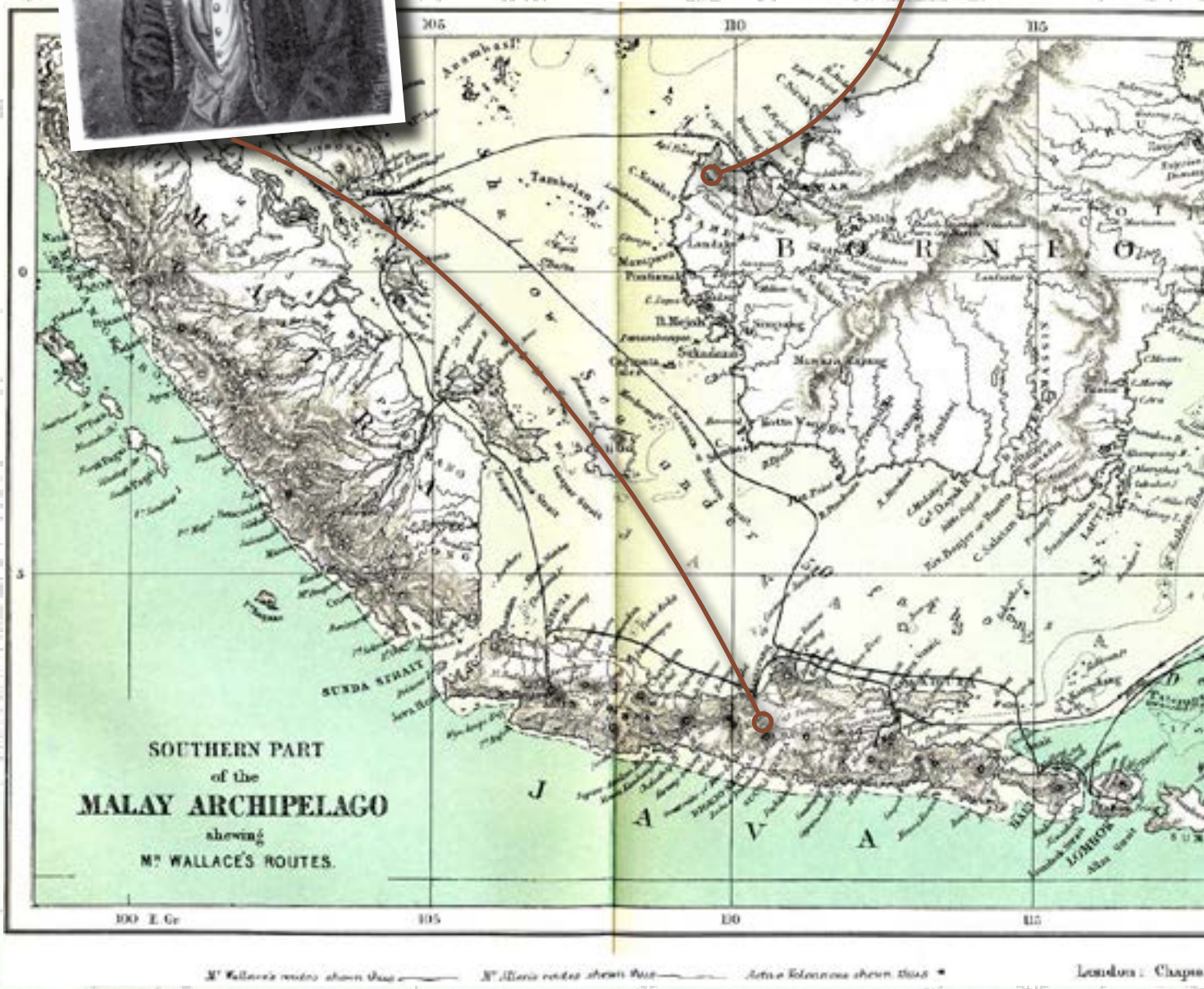
Twenty-six days into the voyage, part of the ship's cargo, balsam packed into wooden kegs, caught fire. The ship sank and all the cargo was lost, including all of Wallace's collections. He saved a few drawings of fish and palm trees, and the thin calico suit he was wearing. After 10 days adrift, the survivors were rescued.

ARW and the Malay Archipelago

In 1854, aged 31, Alfred Russel Wallace set off on an eight year journey of exploration of the Malay Archipelago (now Malaysia and Indonesia). He collected over 100 000 specimens, including thousands of species unknown to science. During this time, he came up with his theory of evolution.

Illustration of a native of Java, from ARW's book *The Malay Archipelago*

Santubong in Sarawak where ARW wrote the first paper in which he mentions evolution. At this stage (September 1855), he understood the result of evolution but not yet how it might work.



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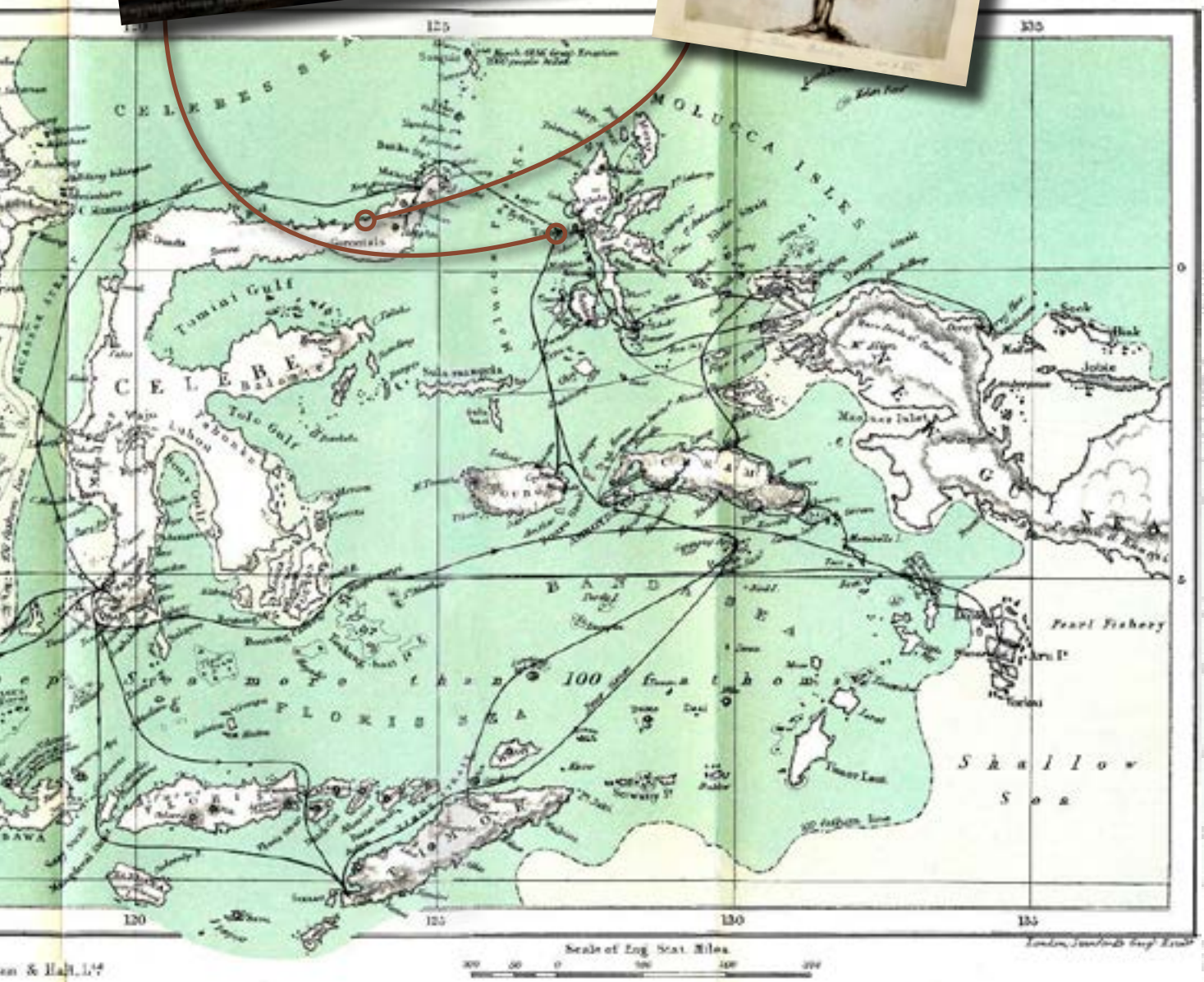
The Island of Ternate in the Northern Moluccas. From here ARW sent Darwin his famous 'Letter from Ternate', including an article about evolution. The ideas in the letter came to Wallace whilst he was suffering from malaria. He wrote:

Then it suddenly flashed upon me that this self-acting process would necessarily improve the race, because in every generation the inferior would inevitably be killed off and the superior would remain—that is, the fittest would survive ... The more I thought over it the more I became convinced that I had at length found the long-sought-for law of nature that solved the problem of the origin of species.

For lots more information about Wallace's life and work see the Wallace Memorial Fund's website http://wallacefund.info/

Drawing by ARW of a sugar palm on Celebes (now Sulawesi) from *The Malay Archipelago*



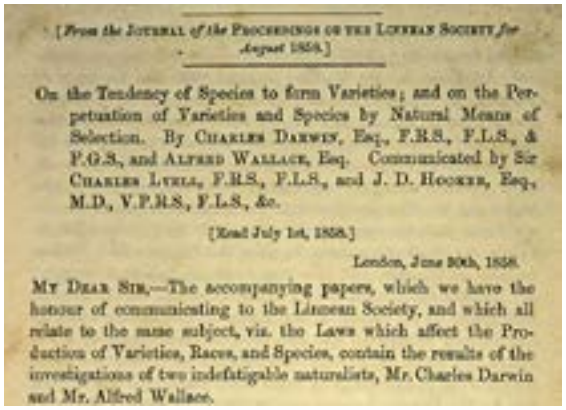
Wallace's theory of evolution

In February 1858, while suffering from malaria, Wallace was suddenly struck by an idea of how evolution works. His idea was remarkably similar to the idea of natural selection which was separately being developed by Charles Darwin. The following June he sent an essay outlining his ideas to Darwin.

This caused Darwin a great deal of anguish. How could he publish his theory of evolution knowing that Wallace had hit upon the same idea? Darwin's friends, the geologist Charles Lyell and the botanist Joseph Hooker came to his rescue.

In July 1858 both men's ideas were presented to the Linnean Society of London and in August a scientific paper containing Wallace's and Darwin's ideas was published. Darwin then set out to write his now famous book, On the Origin of Species, published in November 1859.

Wallace was unaware of what was happening back in London. Yet at no point did he ever complain that 'his' idea had been stolen. In fact he felt honoured to have been published alongside Darwin.



[From the JOURNAL of the PROCEEDINGS OF THE LINNEAN SOCIETY for August 1858.]

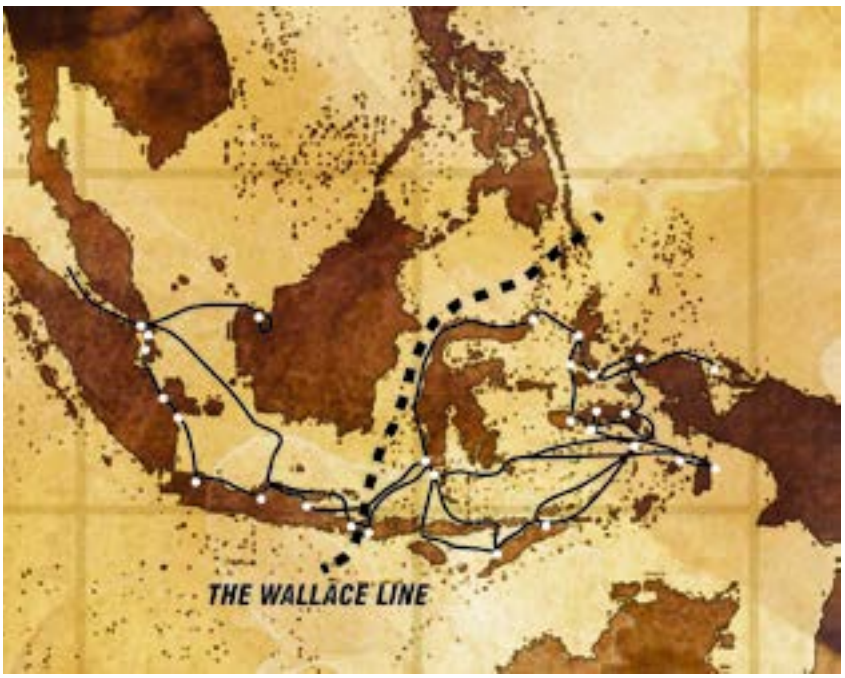
On the Tendency of Species to form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection. By CHARLES DARWIN, Esq., F.R.S., F.L.S., & F.G.S., and ALFRED WALLACE, Esq. Communicated by Sir CHARLES LYELL, F.R.S., F.L.S., and J. D. HOOKER, Esq., M.D., V.P.R.S., F.L.S., &c.

[Read July 1st, 1858.]

London, June 30th, 1858.

MY DEAR SIR,—The accompanying papers, which we have the honour of communicating to the Linnean Society, and which all relate to the same subject, viz. the Laws which affect the Production of Varieties, Races, and Species, contain the results of the investigations of two indefatigable naturalists, Mr. Charles Darwin and Mr. Alfred Wallace.

Darwin and Wallace's joint 1858 paper on natural selection



A modern map of ARW's travels. He drew the 'Wallace Line' separating two regions with very different populations of plants and animals.

Psychics and spiritualism

While in Leicester, Wallace discovered 'psychical research' and 'mesmerism'. He found that he was good at hypnotising people. This led to an interest in spiritualism. When he returned from the Malay Archipelago he attended séances, witnessed door 'rapping', 'tapping' and table movements. He also claimed to have seen these under 'test conditions'.

At first he thought that reports of mediums contacting the dead and séances were the ravings of madmen. But having witnessed some of the phenomena in person, he was more persuaded. He recorded his observations in a letter which he sent to TH Huxley, another well-known scientist who frequently defended Darwin's ideas. Huxley wrote back:

"I am neither shocked nor disposed to issue a commission of lunacy against you. It may be true, for anything that I know to the contrary, but really I cannot get up interest in the subject."

Wallace wasn't trying to persuade other scientists that spiritualism was true. What he wanted to do was encourage scientific investigations of the phenomenon.

Alfred Russel Wallace was one of the great Victorian naturalists. The science of biology owes him a great debt of gratitude.

A spirit photograph featuring Alfred Russel Wallace and the 'spirit of his mother', taken on 14th March 1874.

James Williams is a lecturer in science education at the University of Sussex. Thanks to Dr George Beccaloni of the Wallace Memorial Fund for supplying the images used in this article.