

# Oxford Reference

## OVERVIEW

### Patrick Maynard Stuart Blackett

(1897—1974) physicist

## QUICK REFERENCE

(1897–1974) British physicist

Blackett, the son of a London stockbroker, attended the Royal Naval College at Dartmouth. After serving with the navy in World War I, during which he fought at the Battle of the Falklands and Jutland, he entered Cambridge University, resigned his commission, and decided to become a scientist. He worked in the 1920s with Ernest Rutherford at the Cavendish Laboratory and, in 1933, was appointed professor of physics at London University. In 1937 he moved to Manchester, returning to London in 1953 to take the chair at Imperial College where he remained until his retirement in 1963. During World War II he worked on numerous advisory bodies and from 1942 to 1945 was director of operational research at the admiralty.

In 1921, as Blackett was beginning his research career, Rutherford assigned him the task of using a cloud chamber to discover what happened to a nitrogen atom after it was bombarded by alpha particles. Over four years Blackett took some 23,000 photographs containing some 400,000 alpha particle tracks in nitrogen; amongst these he found eight sets of branched tracks in which he identified the residual atom as an oxygen isotope. Blackett published his discovery of the atomic transmutation of nitrogen into oxygen in 1925.

Blackett continued with the Wilson cloud chamber and began, in collaboration with the Italian physicist Giuseppe Occhialini (1907–1993), to use it to detect cosmic rays. As the appearance of cosmic rays is unpredictable it was standard practice to set up the chamber to take a photograph every 15 seconds, producing a vast amount of worthless material for analysis. To avoid this Blackett introduced in 1932 the counter-controlled chamber. Geiger counters were so arranged above and below the chamber that when a cosmic ray passed through both, it activated the expansion of the chamber and photographed the ion tracks produced by the ray. Using this device they confirmed in 1933 Carl Anderson's discovery of the positron. They also suggested that the positron was produced by the interaction of gamma rays with matter, in which a photon is converted into an electron–positron pair. The phenomenon is known as pair production.

After the war Blackett's research interests moved from cosmic rays to terrestrial magnetism. Using new sensitive magnetometers his group began a major survey of the magnetic history of the Earth. By 1960 they could report that there had been considerable change in the relative positions of the continents over the past 500 million years, thus providing further support for the doctrine of continental drift.

Blackett was also active in public affairs and a noted opponent of nuclear weapons. In 1948 he was awarded the Nobel Prize for physics for "his development of the Wilson cloud chamber and his discoveries therewith in the field of nuclear physics and cosmic radiation." He was raised to the British peerage as Baron Blackett in 1969. **Show Less**

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