

Solutions

2.1 Any two: it challenged the idea that God made all animals and plants; insufficient evidence at the time of publication; the mechanism of inheritance and variation was unknown for 50 years.

2.2 Each characteristic is determined by 'units' passed on unchanged to descendants; genes.

2.3 From parts that have not decayed, because a condition for decay is absent; parts replaced by minerals as they decay; preserved traces such as footprints, burrows and rootlet traces.

3.1 Fossils are the remains of organisms from millions of years ago found in rocks; their sequence shows how organisms have changed/developed over time – evolution; evolutionary trees built from fossils show relatedness. Certainty is impossible because many early life forms were soft-bodied and left few traces; and many of those traces were destroyed by geological activity.

3.2 Bacteria reproduce rapidly and mutations occur continuously, producing new strains; a mutation may give resistance, so the antibiotic does not kill that bacterium; it survives and reproduces, so the resistant population rises and spreads – people are not immune and no treatment works. Measures: doctors do not prescribe antibiotics for non-serious or viral infections; patients complete the course so all bacteria are killed; agricultural use of antibiotics is restricted.

3.3 Wallace independently proposed the theory of evolution by natural selection; he published joint writings with Darwin in 1858; this prompted Darwin to publish *On the Origin of Species* in 1859; Wallace's own evidence – gathered worldwide, e.g. warning colouration and speciation – supported the same theory.