

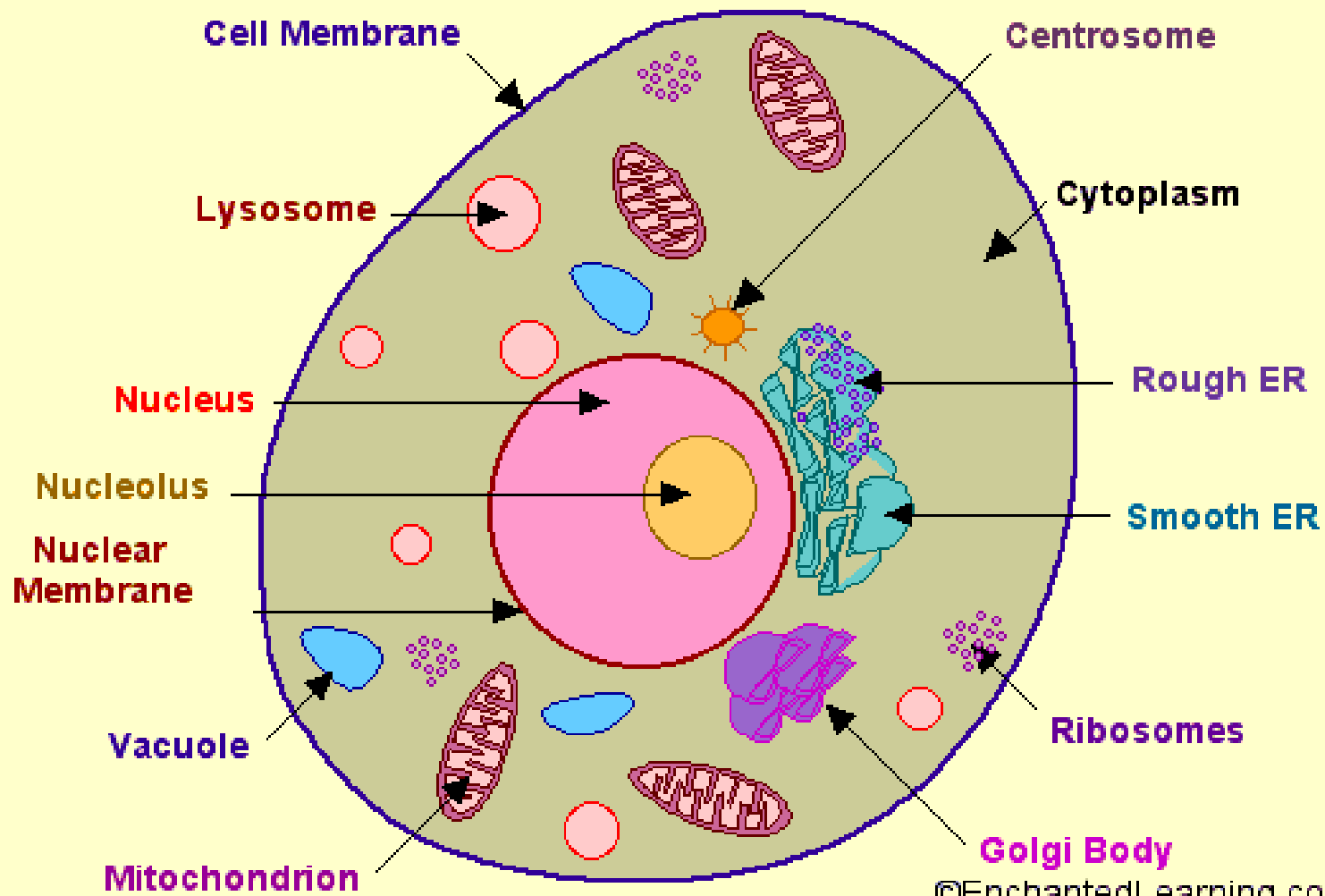
Chemistry 224

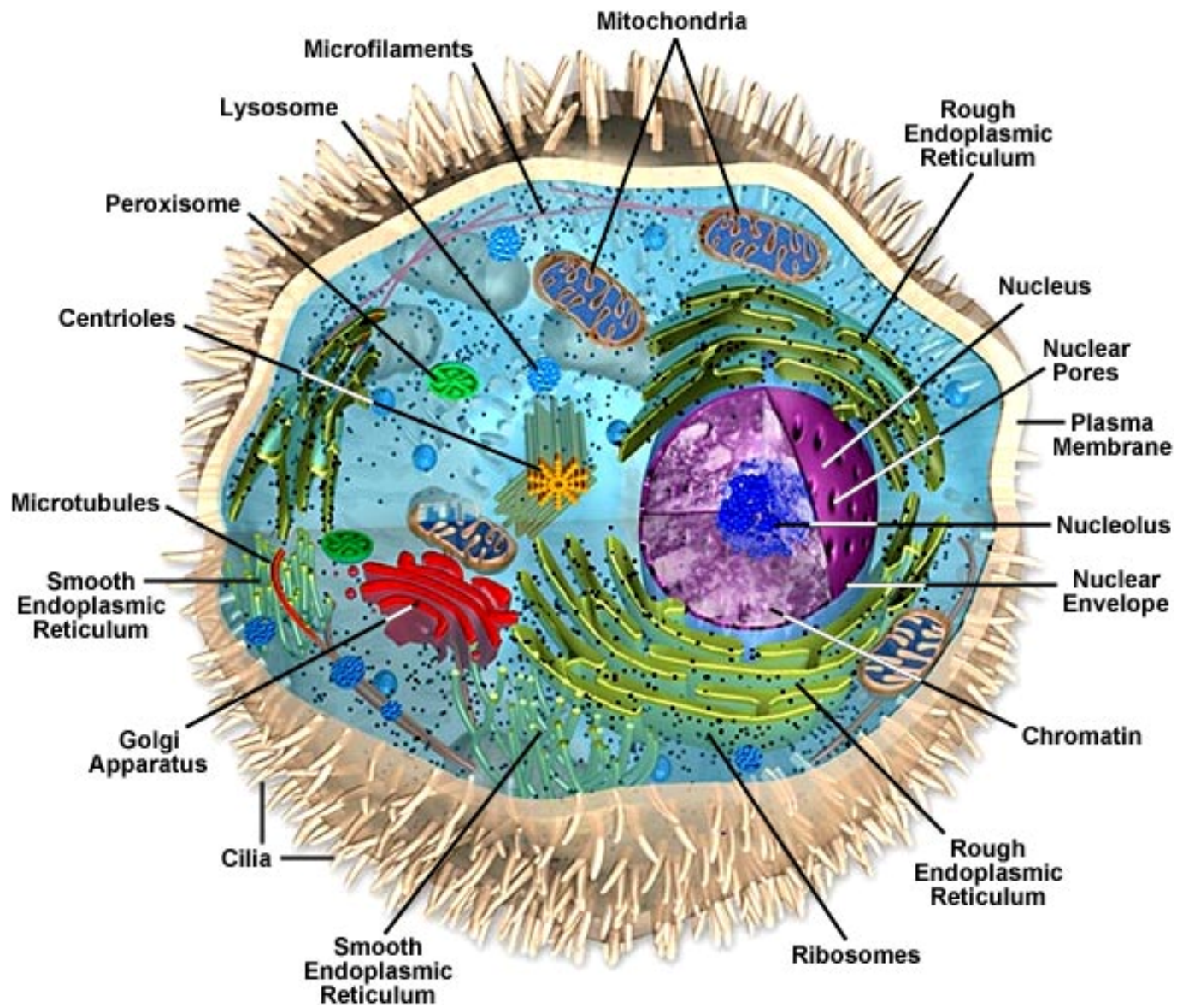
Environmental Toxicology

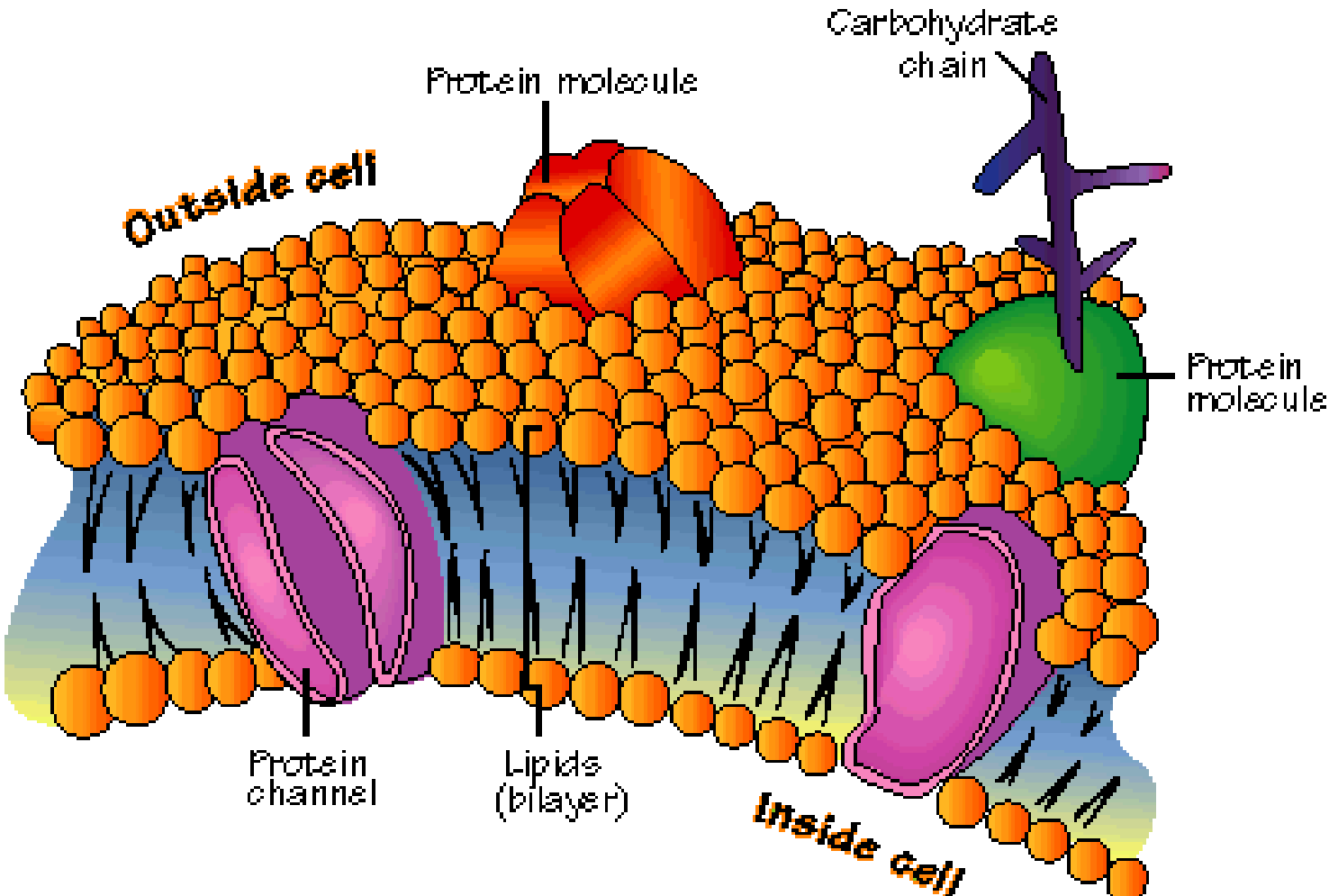
Lecture Two
22 August 2007

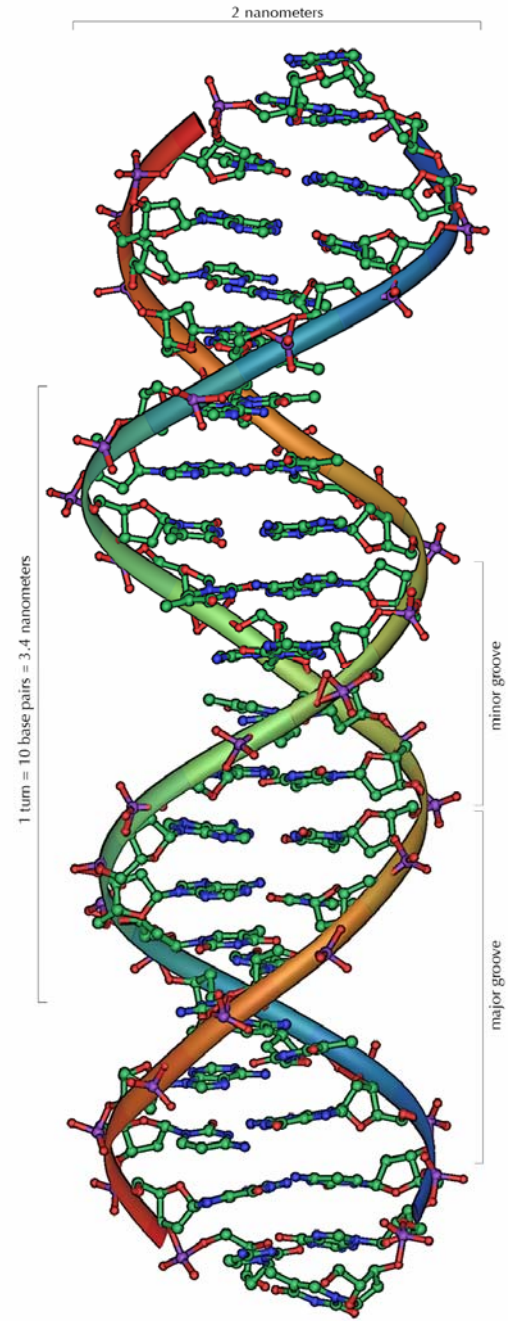
Professor Ian Shaw, Pro-Vice-Chancellor,
College of Science
email: ian.shaw@canterbury.ac.nz

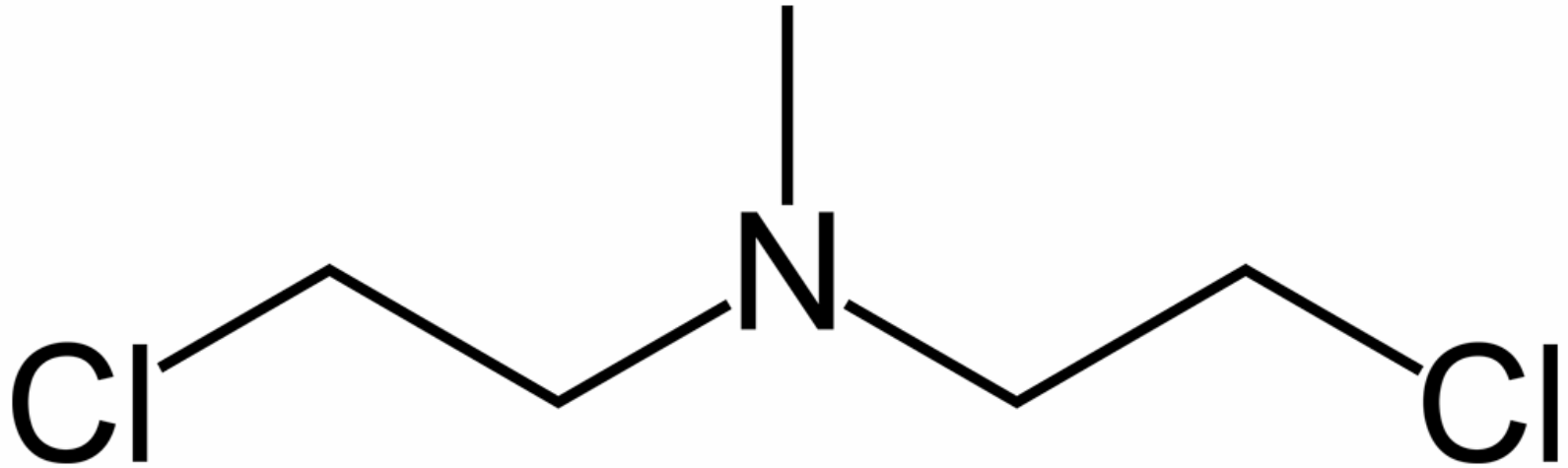
Cross-Section of an Animal Cell



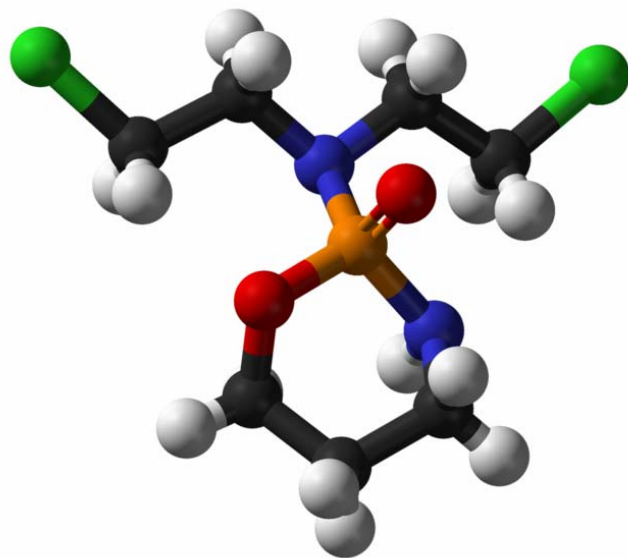
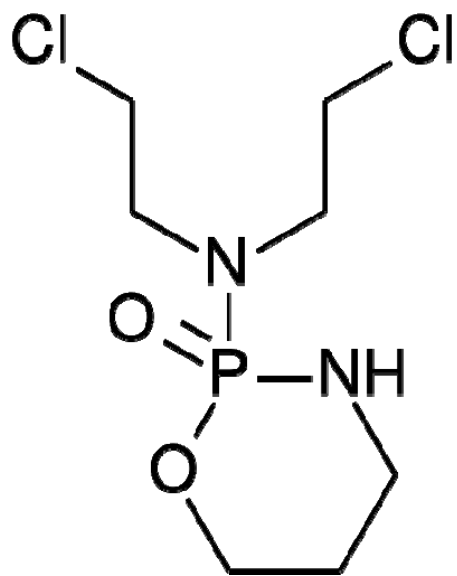




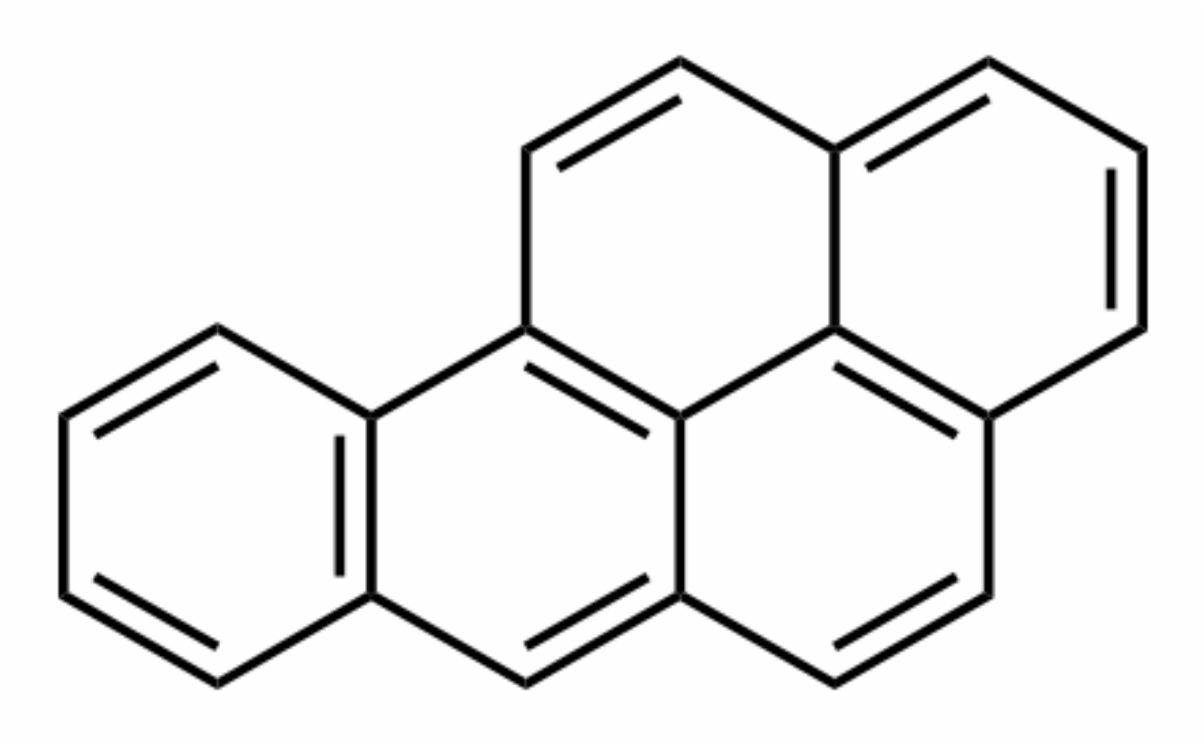




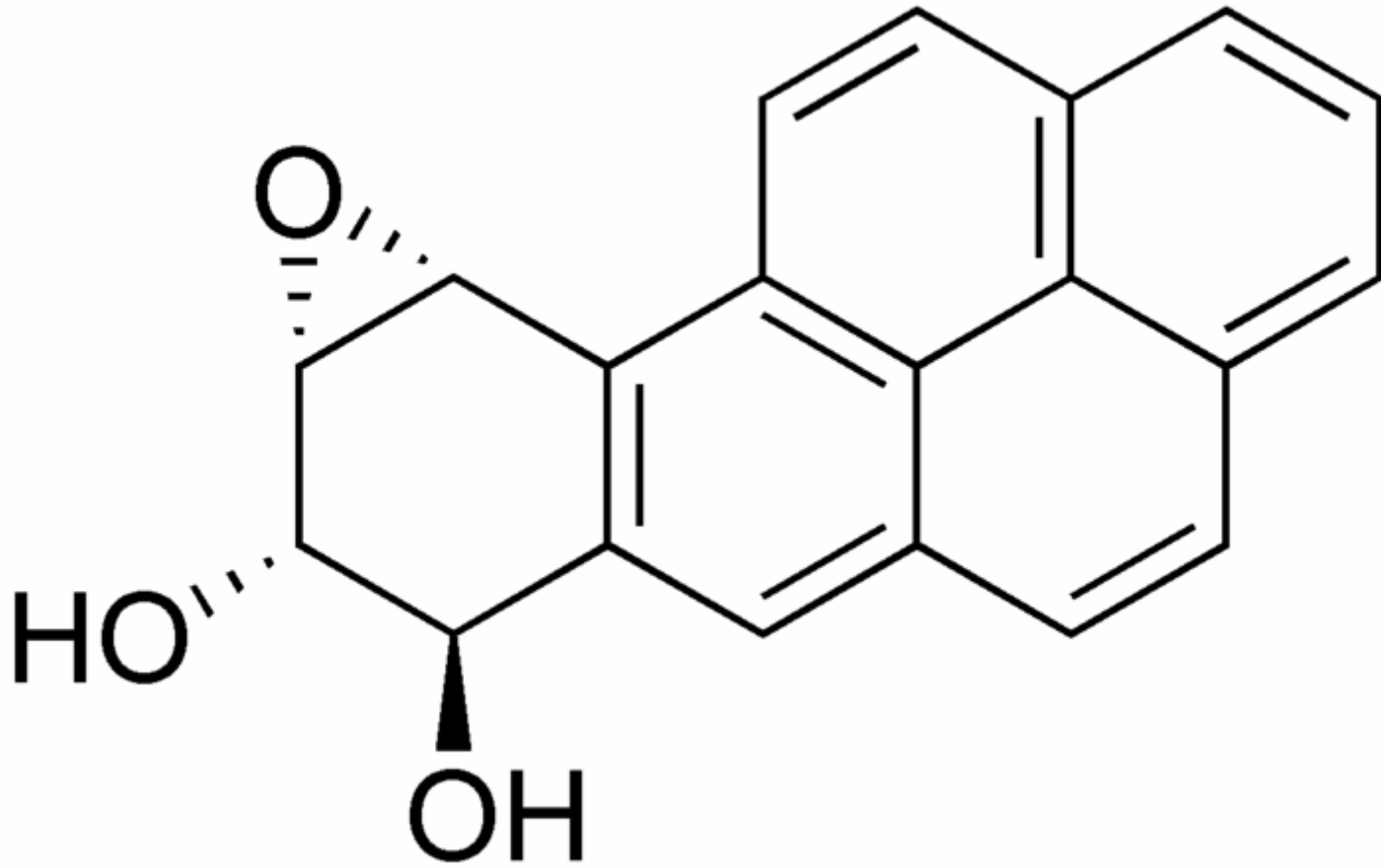
Nitrogen Mustard



Cyclophosphamide



Benzo[A]pyrene



Benzo[A]pyrene Epoxide

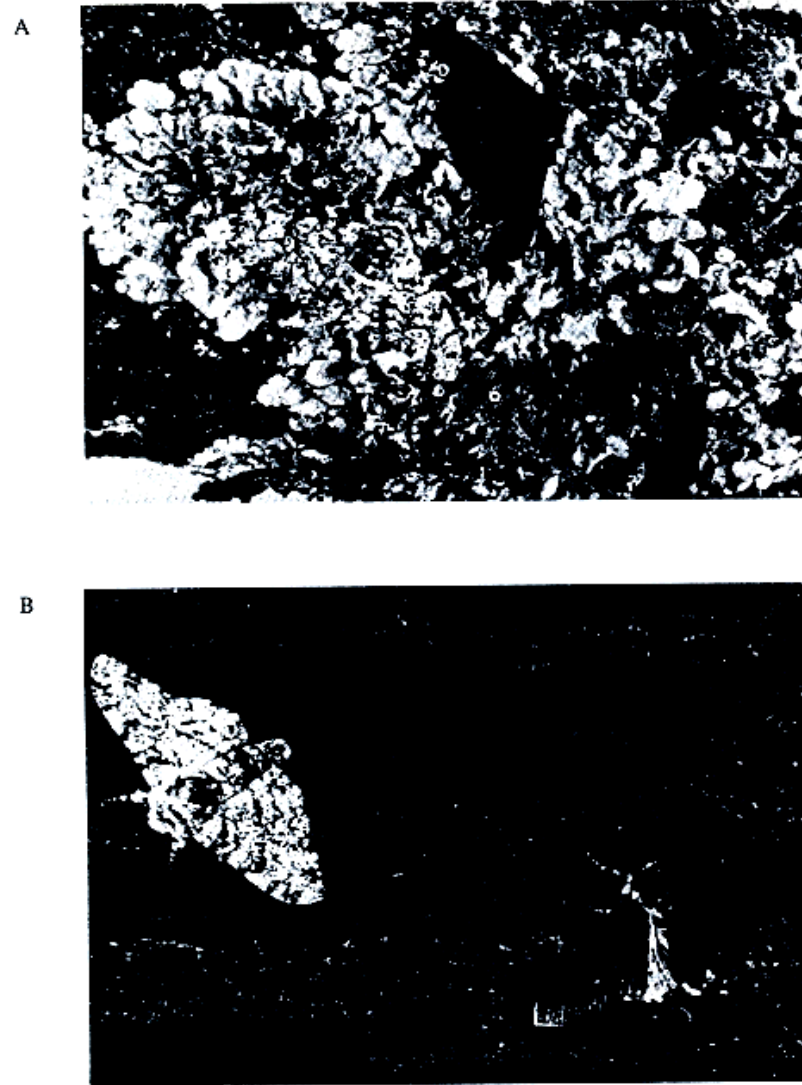


Figure 1.4 The peppered and melanic forms of *Biston betularia* on lichen-covered bark (A) and bark with carbon deposits (B). This shows clearly how well the melanic form is camouflaged on dark bark and the peppered form on lichen-covered bark. Reproduced from *Biology – a Functional Approach* by M.B.V. Roberts, with kind permission of Thomas Nelson Ltd, Sunbury-on-Thames, UK.

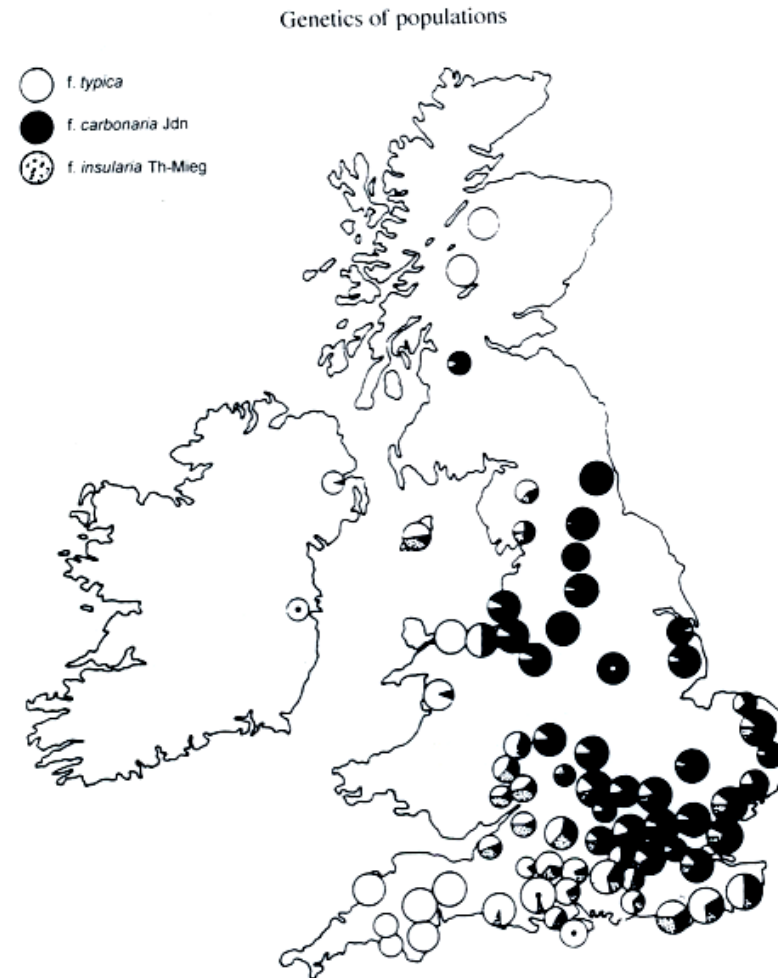


Figure 1.6 Distribution of the peppered and melanic forms of *Biston betularia* in Britain showing that the melanic form was commonest in and around industrial areas. From H. B. D. Kettlewell (1973), *The Evolution of Melanism with Special Reference to Industrial Melanism in the Lepidoptera*, Clarendon Press, Oxford.

England might be rather disappointing because so many buildings are covered with tarpaulin and plastic sheeting during the removal of this unsightly blackness. But what about the pollutants that we cannot see?

It is possible to trace back through many thousands of years the emission of invisible toxic gases. Combustion produces CO_2 , NO_2 and SO_2 . All are toxic by