

# Chemistry 224

## Environmental Toxicology

Lecture One  
20 August 2007

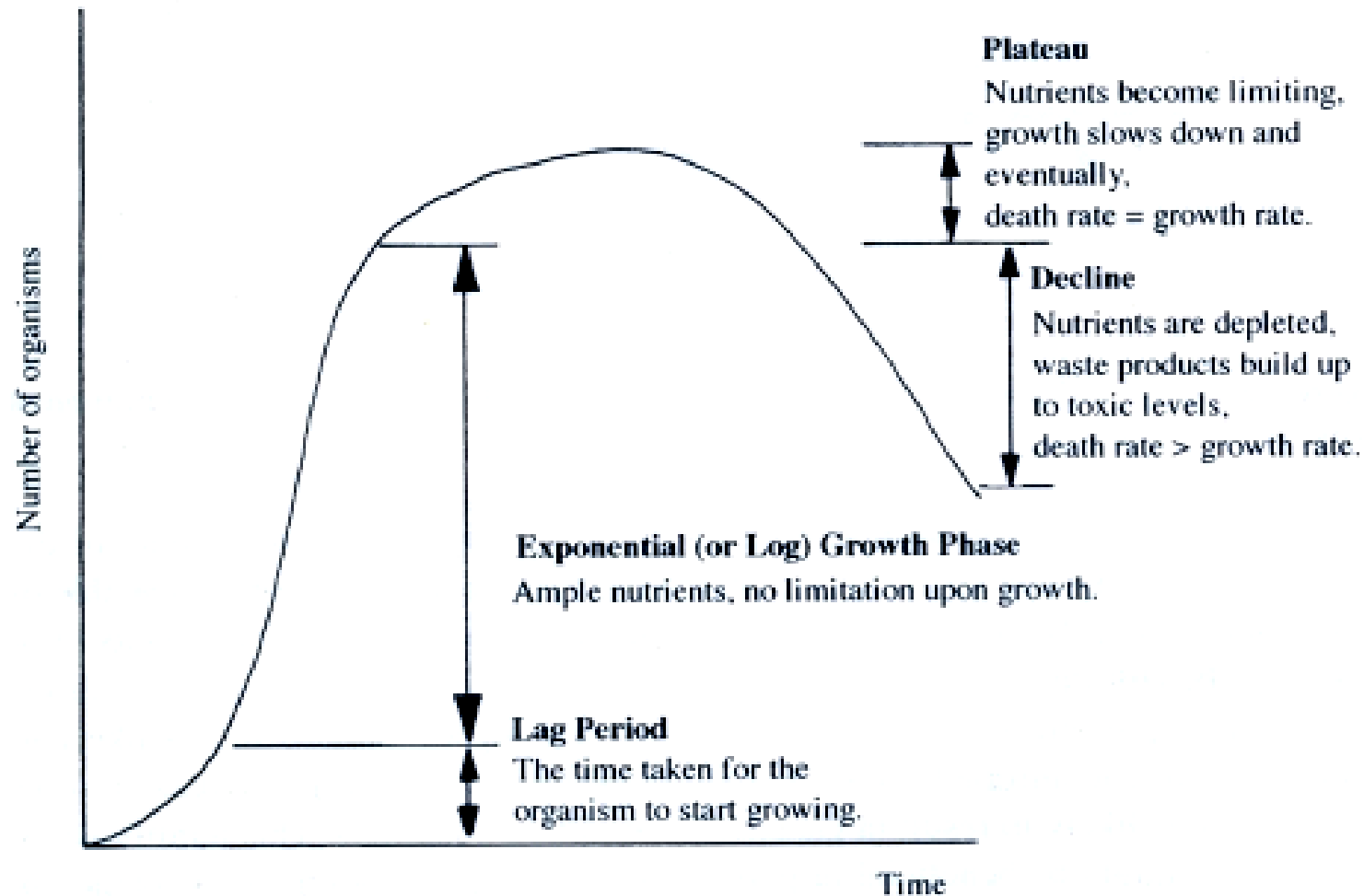
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# **Principles of Environmental Toxicology**

**Ian Shaw & John Chadwick**

**Taylor & Francis 1998**

*Principles of Environmental Toxicology*



**Figure 1.3** Graphical representation of the growth phases of a bacterial liquid culture. This equally well represents the population kinetics of any other species, including humans.

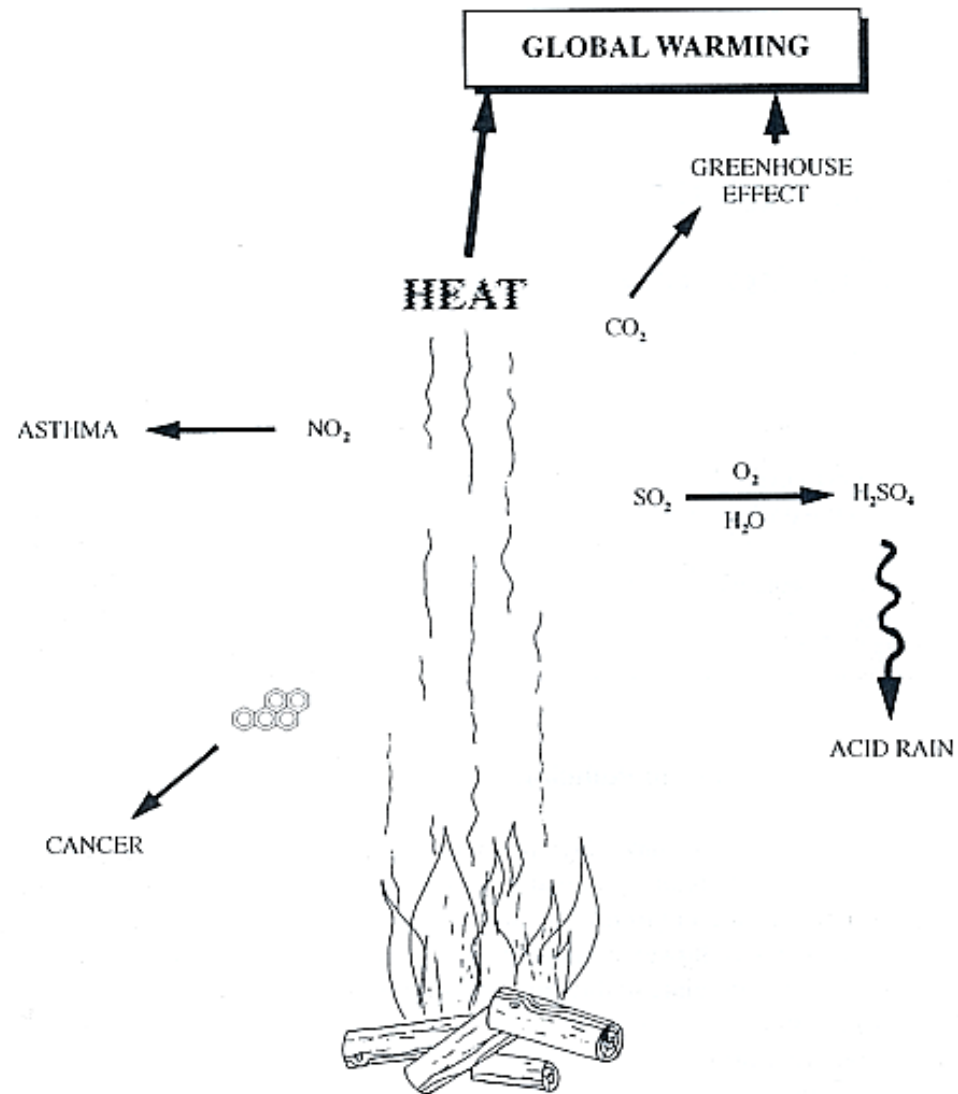


Figure 1.1 Generation of pollutants from fire.



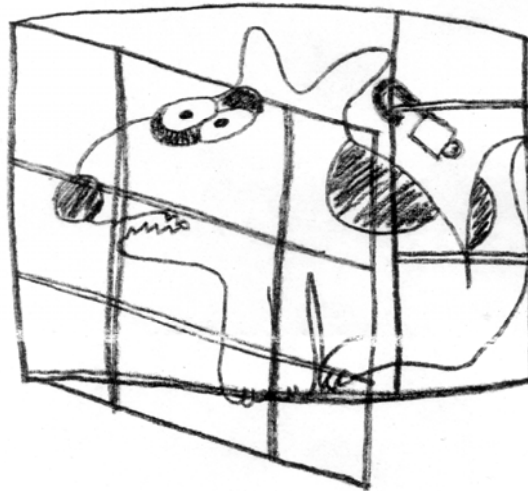
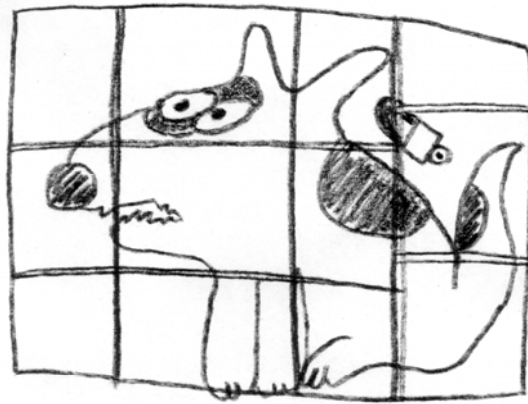
***“All things are poisons,  
there is nothing that is not a poison,  
it is the dose that makes a thing safe”***

**Paracelsus 1493 - 1541**

**Risk = Hazard x Exposure**

**Hazard = Intrinsic Danger**

**eg: KCN High Hazard  
0.0001% KCN Low Risk**



**Hazard**

- 
- High Hazard
  - Low Exposure
  - Medium Risk

**Risk**



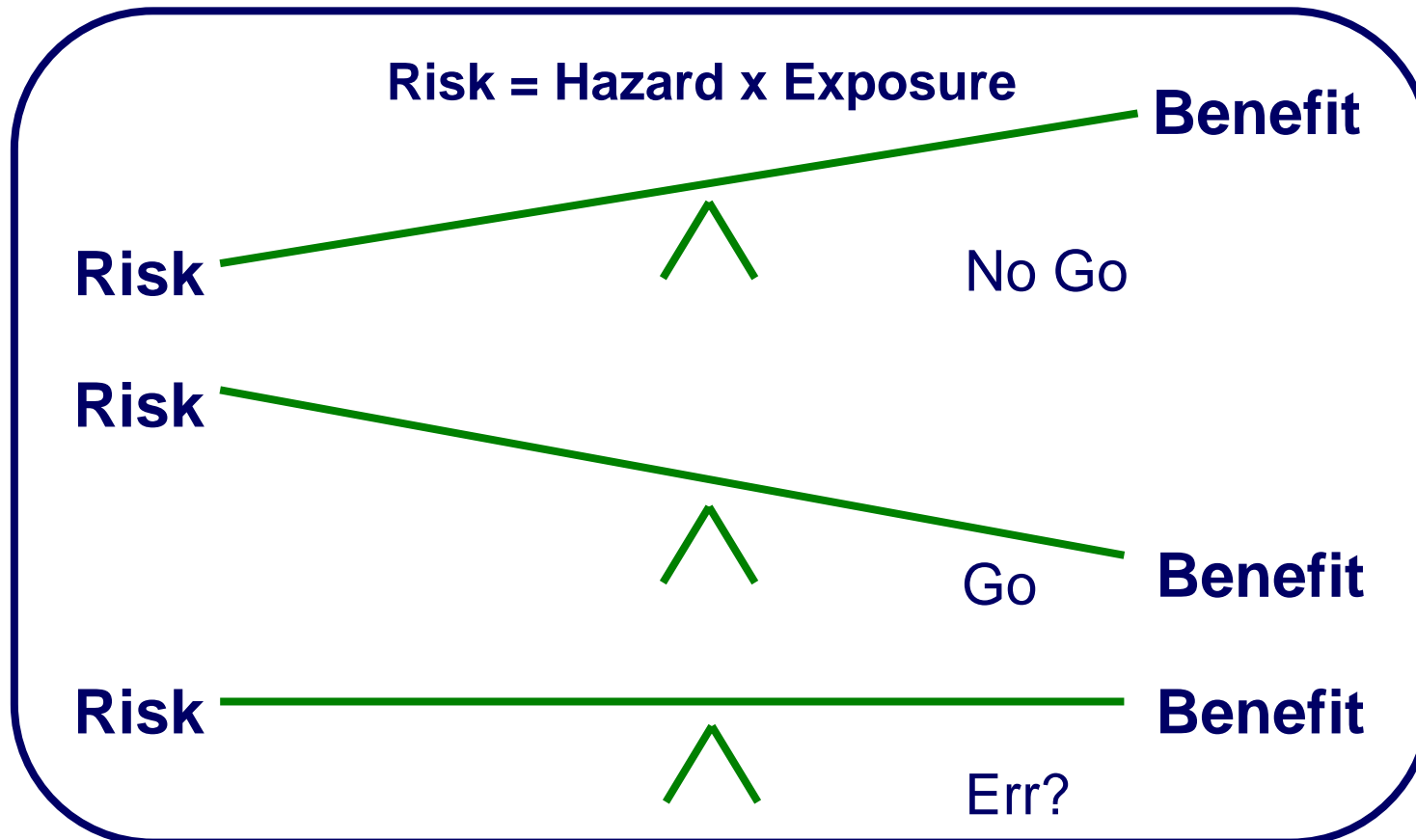
- High Hazard
- High Exposure
- High Risk



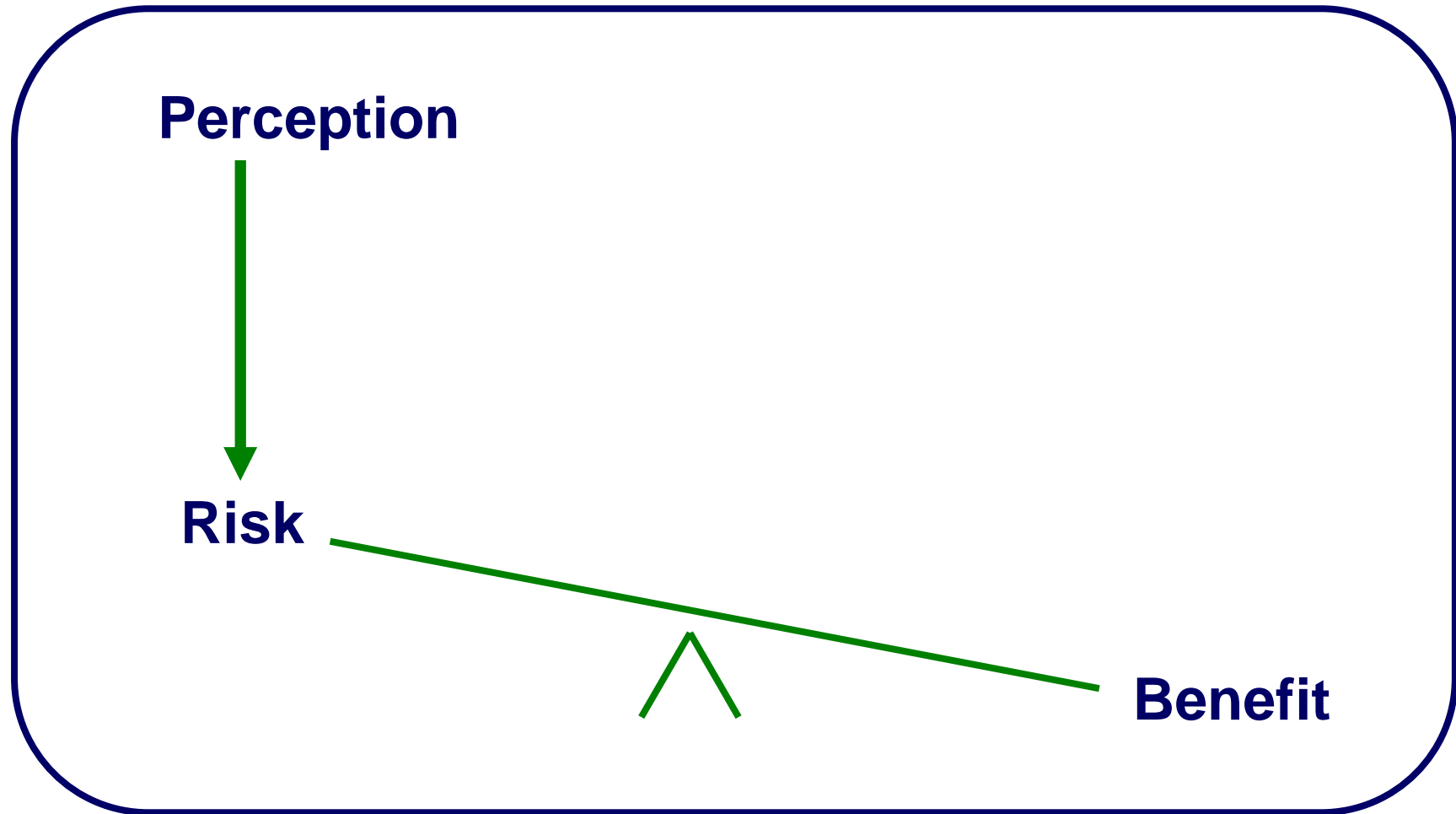
- Low Hazard
- High Exposure
- Medium Risk

**Exposure**

# The Risk: Benefit Balance



# Perceived Risk



**Statement:** Residents of a small community observed that several malformed children had been born there during each of the past few years. The town is in a region where agricultural pesticides have been used during the past decade. It is very likely that these pesticides were the cause of malformations.

<b>Responses (%):</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Don't know</b>
<b>Toxicologists</b>	<b>22.2</b>	<b>59.3</b>	<b>4.3</b>	<b>1.2</b>	<b>13.0</b>
<b>Lay people</b>	<b>3.9</b>	<b>23.4</b>	<b>39.5</b>	<b>9.0</b>	<b>24.2</b>

**Taken from Paul Slovic's The Perception of Risk, Earthscan Publications Ltd., London, 2000.**

# Life is Getting Less Risky

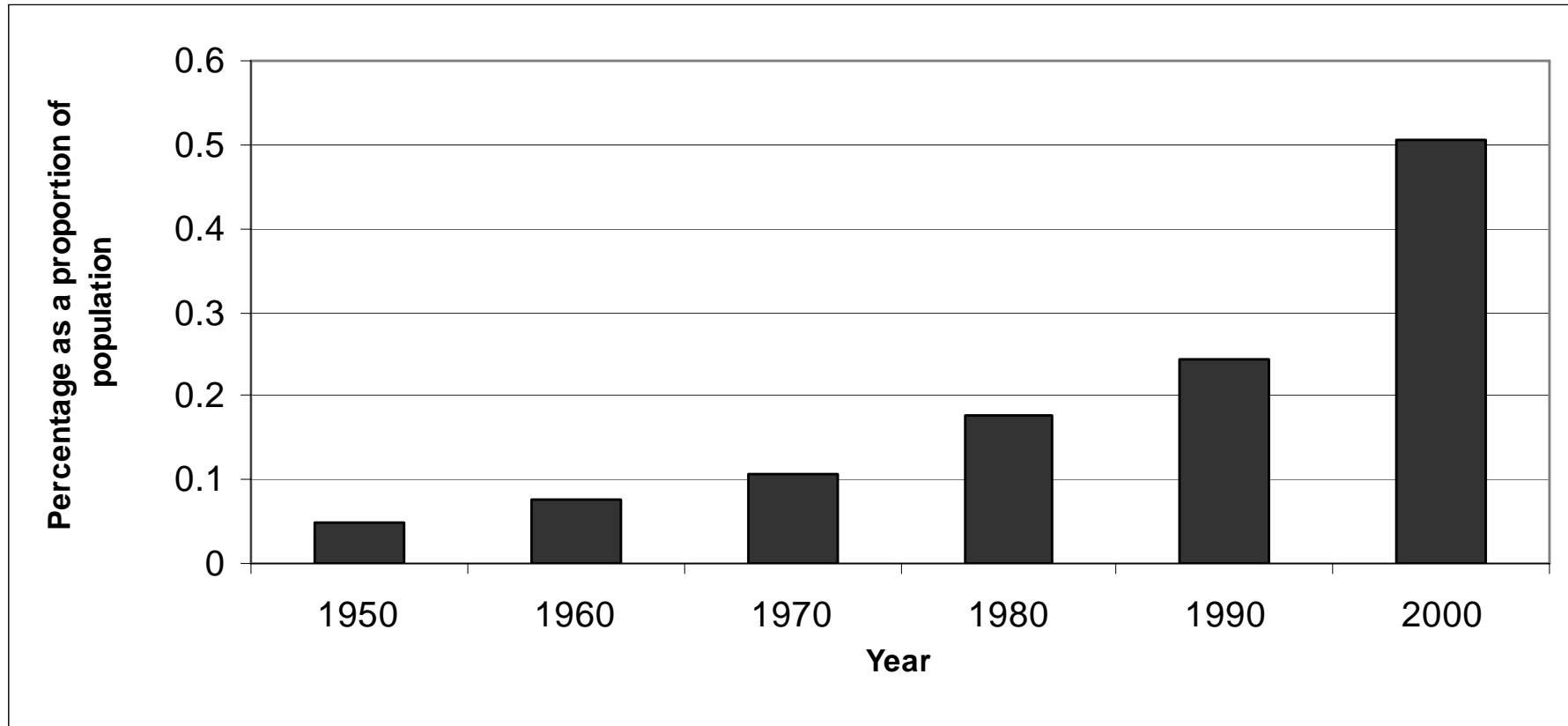


Fig. 2-9. The number of 100-year birthday celebratory telegrams sent by the Queen of England. This shows that a greater proportion of the population are living beyond 100 years so life must be getting less risky.

From: Shaw IC, *Is It Safe To Eat?* Springer-Verlag, 2004

# **Rachel Carson**

**Biologist  
Writer  
Ecologist**

**(1907 – 1964)**



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