

A Seal of Approval – 4

Last time we saw some of the adaptations, or **alterations** within kinds of seals, e.g. of **an organ**, by which seals are **enabled** to function **most efficiently** in their environment. In a similar way mankind has adapted wheeled vehicles, powered by the internal combustion engine, for use in various circumstances. An **ordinary roadworthy automobile** is generally more than sufficient for use by the **civilian operator**.

- But for use by certain branches of **the police**, an ordinary car must be **modified** with a specially designed **police package**. The **designer**, with a good **knowledge** of automotive engineering - and with input from an **experienced** driver - has expended **mental effort** to prescribe a series of **modifications** to that car. His efforts have been directed towards **the goal** of producing a vehicle with superior power, manoeuvrability and safety features by the addition and/or replacement of various operational parts in the original car.

In many other cases it is necessary to produce **the required vehicle** directly from the start - **grader** for levelling the ground in road-making, **tanker truck** for transporting milk and fuel, **scissor lift** to raise workmen high above the ground. Each vehicle has been designed for a particular **purpose**. Creation of the vehicle has required **mental effort** to establish the **specifications** for the vehicle, and from there to provide details of the various **features** which are **needed** to make it work as efficiently as possible.

- In many cases the part played in the **creation** of a new **man-made item** can be too easily forgotten. But a good reminder can occur in a **pharmaceutical pill**, trifling in **size** but prodigious in **price**. A very small proportion is in the material - the **main cost** is for the **immense human effort** in **creating** the product, at the current average of US\$1 billion per item.

Why should it be thought that **no mental effort** has been expended in the creation of **living things**, such as the seal? **The eye** of a seal is equally well adapted for seeing both **underwater** and in **air**. The **cornea**, the transparent circular outer covering at the front of the eye, has a **flattened centre** where refraction of light is **nearly equal** in both water and air.

- Seals also have a **highly specialized** iris - the coloured membrane with an opening in its centre (the pupil) which varies to control the amount of light reaching the retina (the light sensitive area at the back of the eye). The **iris** in seals is associated with **much more muscle tissue** and a greater density of **blood vessels** than in most other animals.

The unusually strong **muscle** in seals, which **controls** the size of the **pupil**, provides a very **large range** in the amount of **light** reaching the back of the eye. This is particularly the case in **elephant seals** which move from **sunny** beaches to **near darkness** during their deep dives.

- The tissue on the outer surface of the **cornea** includes **keratin**, a group of strong, fibrous proteins which are also the main ingredient in feathers, claws, hair and horns. This provides **increased protection** for the eye, while the **extra thickness** of the tough white **outer layer** of the eyeball, which is continuous with the cornea, adds sufficient strength to **prevent implosion** of the eye during deep dives.

Harp seals, with other seals which live in the **bright** and snowy environments of the **polar ice**, have **corneas** that are designed to better endure the high levels of **ultraviolet radiation** without ill effects, and so do not experience **snow blindness**.

- And so from the **specialization** of the eyes alone it is clear that this animal has been **consciously designed** for the function which it performs. More next time, God willing.