



## **Wellcome Film Project**

### **Venomous Snakes (Medical Aspects)**

**Wellcome Film Unit, London, 1950.**

**Script: Dr CJ Hackett.**

**Direction; Photography; Editing: Douglas Fisher.**

**Narrator: Carleton Hobbs.**

**The co-operation of the following is gratefully acknowledged:**

**Dr HW Parker, Keeper of Zoology, British Museum (Natural History).**

**Mr JW Lester, Curator of Reptiles, London Zoo.**

**Dr CH Kellaway, FRS, Director-in-Chief of Research, Wellcome Foundation.**

**Colour**

**Duration: 00:11:03:00**

**00:00:00:00**

**<Opening credits>**

**<Carleton Hobbs narrates over various shots of snakes>**

Venomous snakes are found in many parts of the world and the dangers from their bites are often exaggerated. Much accurate scientific work has been carried out in this field but it has not always removed the superstitions of popular fancy. The application of modern knowledge will greatly reduce the danger of snake bites. In a limited time it is impossible to consider in detail all aspects of this subject, but the characteristics of the different groups of snakes and their venoms and the principles of adequate treatments should be widely known and are dealt with in this film.

**<Hobbs over close shots of snakes head>**

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All venomous snakes have two or more teeth on the upper jaw, specially adapted for the injection of venom. For this purpose, these teeth are enlarged and canalised. The venom-secreting glands lie below and behind the eyes and are connected by ducts to the fangs. In striking, they are compressed by muscles, and the venom is forced through the fang.

### <Hobbs over diagrams listing snake families, interspersed with close shots of snake skulls>

All snakes belong to the suborder Serpentes, of the order Squamata. The Serpentes are divided into eight families, of which two contain all the venomous species. These are the Colubridae and Viperidae. The Colubridae are subdivided into three groups. The Aglypha are without fangs and are not venomous. The second group, the Opisthoglypha, have fangs at the back of the maxilla; these snakes are not very venomous and are not usually dangerous to man. The third group, the Proteroglypha, are the front-fanged snakes; these comprise the Elapinae which include the cobras, kraits and mambas and the Hydrophinae or sea snakes. This is the skull of the Indian cobra – the fangs are at the front of the maxilla. Two or three smaller maxillary teeth are generally found behind them. On the upper surface of the head there are nine large scales or shields, this is characteristic of the Colubridae.

The other family, the Viperidae, are divided into the Viperinae or the true vipers, or the Crotalinae, comprising the pit vipers and rattlesnakes. Snakes of this family have large, well-developed front fangs and no other maxillary teeth. In biting the fangs are rotated forward or erected. The head is flattened and often triangular and the upper surface is usually covered with many small scales. This is the head of a Russel's viper. The Crotalinae have all the features of the true vipers but in addition they have a loreal pit on the side of the face between the eye and the nasal opening; this is a heat receptor for the perception of warm-blooded prey in darkness. For comparison, this is the skull of a python which is non-venomous. It has many back-pointing teeth on the maxillary, palatine and pterygoid bones, but no fangs.

**00:04:21:19**

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<Hobbs over shots of various snakes, alternating with intertitles>

<Intertitle>

**A Back Fanged Colubrid**

***Thelotornis Kirtlandii***

**(Hallowell, 1844)**

**South Africa**

The Kirtland tree snake is an opistoglyph colubrid; it has back fangs and the characteristic head shield pattern. It is a slender arboreal snake with a sharp snout and is not very dangerous to man.

<Intertitle>

**A Hydrophine**

***Pelmis Platurus***

**(Linn. 1766)**

**Indian Ocean**

The sea snakes, or Hydrophine, may be very venomous. They have flattened or shaped tails. This is a sea snake which is found in the Indian or Pacific Ocean.

<Intertitle>

**An Elapine**

***Naja Naja***

**(Linn. 1758)**

**India**

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The Indian cobra is an Elapine; only cobras possess hoods. The head is small, the neck is not well-defined and the body and tail are long. When angry, it raises its head to strike and expands its hood by spreading its anterior rim. Some Indian cobras have distinctive markings on the back of the hood; other cobras have no mark at all.

<Intertitle>

### **A Viperine**

***Bitis Gabonica***

**(D. and B. 1854)**

### **Africa**

The Gaboon viper belongs to the Viperine or true vipers. Its head is large and triangular and its neck is well-marked. This snake lives on small mammals and it is usually sluggish until aroused when it strikes rapidly. Like all vipers, it has a short, stout body, and a short, stumpy tail. Against its natural background of grass and sand, it may be difficult to detect. The full richness of its colour is apparent for this viper has recently cast its skin. As it moves, the pattern on the side of its body gives a curious appearance of legs.

<Intertitle>

### **A Crotaline**

***Crotalus Horridus***

**Linn. 1758**

### **North America**

The banded timber rattlesnake is one of the Crotaline or pit vipers. The rattle is seen in only two genera of pit vipers – *Crotalus* and *Sistrurus*. In contrast to the elevated striking position of the cobra, vipers make their attack from a lower level.

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### <Hobbs over shots of snake venom being extracted from snake, then table showing action of venoms>

Snake venom is secreted as a specialised saliva whose active agents are certain protein enzymes. Its purpose is to immobilise the prey and aid in its digestion.

The typical action of the venoms of the Colubridae is neurotoxic with paralysis; while that of the Viperidae is cytolytic with haemolysis, haemorrhage and tissue destruction. Clotting of the blood may also be altered. These differences are not always so well defined and in some species there is considerable overlapping.

Following colubrid bites, paralysis may develop, and if death occurs it is from respiratory paralysis. After viper bites there is extensive tissue destruction around the bite, and damage to the cardiovascular system with intravascular haemolysis and haemorrhage; death may be delayed for several days.

### <Hobbs over close shot of snake's mouth and bite patterns>

A venomous snake may be recognised by the presence of fangs which may be partly hidden in folds of mucus membranes. To recognise the bite of a venomous snake, first fang punctures should be sought. This dental impression from an Elapine, made by Dr N Hamilton Fairley, shows the fang punctures and marks of the small maxillary teeth. The palatine and pterygoid teeth marks are seen on each side of the midline.

### <Intertitle>

## Treatment of Snake Bite

### <Hobbs over shots of how to treat snake bites>

Ideal treatment is the early intravenous administration of an adequate dose of a specific antiserum. In practise, immediate first aid measures are essential. A tight

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tourniquet should be applied at once to restrict all blood flow to and from the limb, and the patient made to lie down. The bitten area is then thoroughly washed to remove venom on the surface of the skin. Incisions are made through the fang marks and in Viperine bites, near by, to allow some venom to escape with the blood and serum. To encourage this escape of venom, suction is applied, either by mouth or by suction cup; this is maintained intermittently for some hours. The experiment has shown that lethal doses of venom can be removed in this way. The tourniquet must be briefly loosened every ten or fifteen minutes. In viper bites the tourniquet should be applied only tightly enough to restrict the venous return from the limb. The tourniquet alone may save lives in the case of viper bites, but will only postpone death after lethal doses of colubrid venom. Bites on parts where a tourniquet cannot be used, should immediately be excised and suction applied.

Antiserum, as soon as it is ready, is injected into a vein above the tourniquet and in viper bites also around the bite itself. General measures to combat shock, paralysis, haemorrhage or secondary infection may also be required.

To summarise the steps in the practical treatment of snakebite:

### <Hobbs narrates over list of treatments for snakebite>

A tourniquet is immediately applied. The bitten area is washed and incised and suction is applied. As soon as antiserum is ready, it is injected and any other effects of the venom and secondary infection are treated.

<End credits>