

A CASE IN SOUTH AFRICA OF OCULAR MYIASIS IN MAN DUE TO THE FIRST-STAGE LARVAE OF THE NASAL BOT FLY OF THE SHEEP (*OESTRUS OVIS L.*)

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On 16 October 1959 one of the members of the staff of the Veterinary Research Institute at Onderstepoort while walking within the grounds of the institute at about 11 a.m. experienced sudden intense irritation in the right eye and complained of feeling a moving object under the upper lid. Upon examination a small white maggot-like larva was clearly discernible moving fairly rapidly over the sclera. Attempts at irrigating the sclera with normal saline with the object of washing out the larva failed to remove it and it was finally extracted by means of a pair of fine-pointed forceps. The irritation, however, persisted and the patient stated that he was aware of further movement over the sclera, especially the medial canthus. As superficial examination failed to reveal any further larvae present, and by this time a fairly severe conjunctivitis had set in he was advised to consult an ophthalmologist. Upon the patient's arrival at the consulting room the affected eye was subjected to close scrutiny.

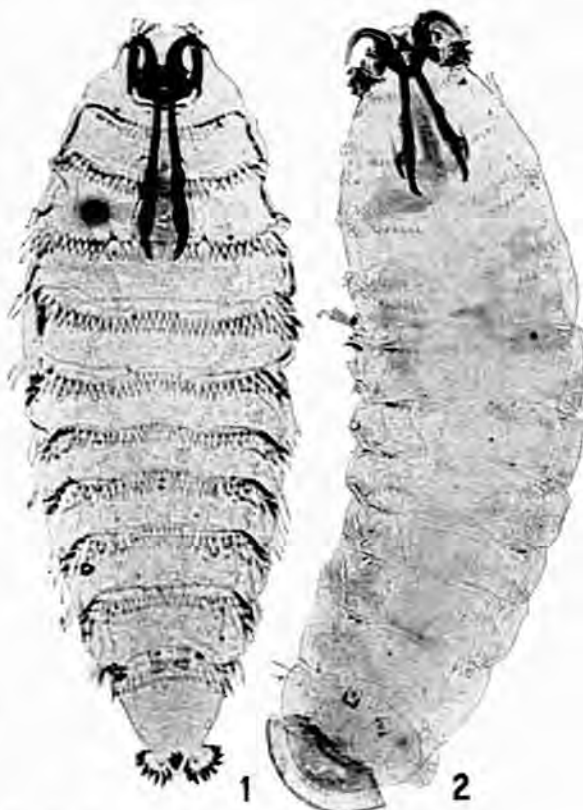
With the naked eye nothing could be detected. On  $\times 16$  magnification with the corneal microscope and slit lamp the larvae could be seen clearly in the upper and lower fornix, hiding in the conjunctival folds. As soon as they were exposed by manual eversion of the conjunctival folds they moved away from the light at a speed of 1 cm. in two or three seconds to disappear in another fold of the fornix.

The larvae are about 1 mm. long and  $1/3$ rd of a mm. wide, and of a slightly fleshy colour. They have a number of hooks which hold tightly to the conjunctiva. They prefer to hide in the upper fornix.

After a local anaesthetic was instilled into the eye, irrigation was attempted with a plastic bottle. A strong stream of water was squirted into the fornix several times but with no success. Removal was then accomplished with the aid of the slit lamp and  $\times 16$  magnification. Small non-tooth forceps were used to catch each larva as it passed the eye field. Eight larvae were removed.

One larva removed from the eye was mounted and examined microscopically; it proved to be a typical first-stage larva of *Oestrus ovis* (Fig. 1).

It is of interest to record that at no time was the patient aware of the presence of an adult fly, the first indication being the irritation and the awareness of movement over the sclera. The method by which the larvae could have been introduced into the eye remains an open question; the patient gave us the assurance that he had had no contact with sheep during the course of the morning. Large numbers of sheep are present at Onderstepoort and infection among them by the larvae of the nasal bot fly is a common occurrence. It was finally concluded that the living larvae had been introduced into the eye by an adult fly unknown to

Fig. 1. *Oestrus ovis*. First-stage larva.Fig. 2. *Gedoelstia cristata*. First-stage larva.

the patient, according to the habit displayed by the species in attacking sheep, where it has been observed that the female fly hovers near the nostrils of the animal and darts in to deposit living larvae on the external nares without actually alighting.

A perusal of the literature has revealed that infection of man is a common occurrence in countries bordering the Mediterranean sea. Sergent (1952), in summarizing the occurrence of oculonasal myiasis in man due to *O. ovis* in Algeria, appears to have been the first to record the infection, as far back as 1907, and mentions that it is a quite common occurrence in the mountainous regions where the human population is large in relation to the sheep population, but rare where the reverse is the case. Favier (1958) records a case of oculonasal myiasis from the same area (Southern Oranais). Keiser (1949) describes the first case

in man from Switzerland. Mazina (1948) describes a case of acute proptosis which resolved when the larva of *Oestrus ovis* had appeared through a fistula in the upper lid. Infestation of a socket and nasal cavity after an enucleation was recorded by Martino (1947).

James (1947) records the infection in America. Basu *et al.* (1953) record 4 cases in man from India, where the strikes occurred on the nostrils. Pampiglione (1958) carried out extensive investigations and reports upon the condition as being of common occurrence particularly among shepherds; in Sardinia, of 414 human cases investigated 50% had been attacked and of these 77% were in shepherds; in Italy 101 shepherds were interviewed, of whom 85.6% reported having experienced one or more infections. This author records infection by the larvae of *Oestrus ovis* in the upper respiratory tract involving oral, nasal, tonsillar, pharyngeal, laryngeal and aural as well as ocular myiasis.

Among the records cited, the authors have stated that in cases where treatment or mechanical removal of the larvae had not been applied the infection cleared spontaneously after the lapse of 3-10 days and in no case did the larvae develop beyond the first stage nor did there appear to be any tendency on the part of the larvae to penetrate deeply into the tissues.

#### GEDOELSTIA LARVAE

Of a somewhat different nature is an infection among domestic stock, including sheep, cattle and horses, which has been the subject of investigation for some years in the western dry regions of the Union of South Africa and eastern parts of South West Africa. This infection, which has been referred to locally by the Afrikaans name of *uitpeuloogsiekte* (bulging eye disease), occurs in epizootic form only when, owing to drought as a rule, intermingling of game animals, blue wildebeest (*Connochaetes taurinus* Burch.) and hartebeest (*Alcelaphus caama* Curr.) with domestic stock occurs. First-stage larvae of two oestrid flies, *Gedoelestia hassleri* Ged. and *G. cristata* Rod. & Beq. have been recovered from various organs of the stock and appear to be definitely associated with the epizootic condition. One human infection has been recorded from the Kuruman district, where a specimen of *G. cristata* was captured after it had deposited large numbers of larvae in the external ear.

In the cases recorded in stock the first-stage larvae (Fig. 2) have been recorded from the anterior chamber of the eye, the coronary arteries, and the lungs, where they have been associated with extensive thrombus formation and inflammation of the surrounding tissues along fairly clearly defined tracks. Similar inflammatory tracks had been noted in the meninges and brain tissues, although attempts at recovering larvae from these situations have as yet yielded negative results.

In contrast to the habits of the first-stage larvae of *Oestrus ovis*, which display little or no tendency to penetrate into tissues, the larvae of the *Gedoelestia* species exhibit similar tendencies to those of the warble flies, Hypoderma species, which commonly

attack cattle in Europe and America, penetrate into the subcutaneous tissue, and migrate extensively to remote regions of the body. The larvae of *Gedoelestia* appear to penetrate deeply into the tissues in the vicinity of the situations in which they are deposited, generally the conjunctiva, and in this way apparently enter the blood stream, which would account for their presence in the situations noted. In their definitive hosts, namely, wildebeest and hartebeest, they occur normally in the frontal sinuses of the head, where they undergo two edyses and are expelled after reaching the third stage, to undergo pupation in the ground and ultimately produce adult flies. In a number of wildebeest which have been examined recently it appears to be a regular finding that first-stage larvae can be recovered from the subdural space in the region of the olfactory lobes of the brain, having gained entrance presumably via the turbinate bones and ethmoid meatus (Basson 1959). In all cases, however, no evidence of destruction of tissue or the presence of inflammatory reactions has accompanied the finding of the larvae in these situations, which would appear to indicate that this may constitute a normal phase of their development cycle in these animals.

#### Conclusion

The human infection with *Oestrus ovis* recorded here appears to be the first case encountered in the Union of South Africa so far as medical literature is concerned, although the species is widespread in this country (du Toit 1956), and demonstrates the importance of scrutinizing all irritated eyes with a high magnification in the fornix. By this method this condition may be discovered more frequently, especially in sheep areas with many flies, even under normal hygienic conditions.

#### SUMMARY

A South African human case of infection of the eye with the first-stage larvae of the nasal bot fly of the sheep (*Oestrus ovis*) is described. This appears to be the first case recorded in the Union.

The literature recording similar cases in other parts of the world is cited.

Reference is made to myiasis with *Gedoelestia* species in blue wildebeeste and hartebeest, which occasionally occurs in epidemic form in sheep, cattle and horses, and has been recorded in one case in man in the Kuruman district.

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