Confirmation of the gender of the last captive Thylacine

Stephen R. Sleightholme

Project Director - International Thylacine Specimen Database, 26 Bitham Mill, Westbury, BA13 3DJ, UK.

Corresponding Email: DrSleightholme@aol.com

ABSTRACT

The gender of the last captive thylacine (*Thylacinus cynocephalus*) or Tasmanian tiger has been a point of debate since its death at the Beaumaris Zoo in Hobart, Tasmania on the night of the 7th September 1936. Recent detailed examination of a single frame from the historic motion film footage taken by Dr David Fleay in 1933 has confirmed that the thylacine was male.

Key words: Thylacine, Tasmanian tiger, *Thylacinus cynocephalus*, Gender, Beaumaris Zoo

"All truths are easy to understand once they are discovered; the point is to discover them".

Galileo Galilei

Introduction

The Thylacine or Tasmanian tiger (*Thylacinus cynocephalus*) was the largest marsupial carnivore to have existed into modern times. The last known captive specimen died at the Beaumaris Zoo on the Queens Domain in Hobart on the night of the 7th September 1936. The minutes of the Hobart City Council Reserves Committee[1] for the 16th September 1936 record the event:

> *"The Superintendent of Reserves reported that the Tasmanian tiger died on Monday evening last, 7th instant, and the body has been forwarded to the Museum".*

It is said that when the body arrived at the Tasmanian Museum the skin was deemed to be in such poor condition that no effort was made to preserve it[2]. Elias Churchill, a timber cutter and trapper, is acknowledged by most authors (Sharland[3], Paddle[4], and Moeller5) as its captor, Churchill having snared the thylacine in the Florentine Valley in 1933. In the absence of a skin or any skeletal remains6, the gender of the last captive thylacine has been the focus of debate since its death.

Debate

The Australian zoologist Dr David Fleay[7] filmed and photographed the last thylacine to be exhibited at the Beaumaris Zoo on the 19th December 1933 and made reference on a number of occasions that his subject was male. In an article published in the Australasian newspaper on the 20th January 1934, and only one month after his visit to Beaumaris, Fleay notes:

> *"First & foremost is a fine male marsupial wolf, actually the sole member of its kind in captivity today. The big fellow in the zoo was not a safe companion inside his enclosure, and while photographs were being taken Mr Reid[8] had to ward him off continually with a paling".*

The Argus newspaper of the 17th January 1934, reported that the thylacine Fleay had photographed was male:

> *"The pictures obtained at Hobart by Mr. David Fleay include studies of the male marsupial wolf or tiger".*

In an illustrated article entitled "*Strange Animals of Australia,*" published in the September 1963 edition of the National Geographic magazine, Fleay states:

> *"Early observers marvelled at the creature's huge jaws, opening almost to the ears. Some idea of this is conveyed in the photograph I took of the last one in captivity. This male specimen, fed on horsemeat and hungry for variety,*

1 Reserves Committee, Minute Books (1924 – 1937) Hobart City Council [Archives Office of Tasmania].

2 No records exist to confirm that the body of the last captive thylacine was ever delivered to the Tasmanian Museum.

3 Sharland, M.S.R. [letter dated 17 December 1972] Thylacine Papers - Queen Victoria Museum & Art Gallery.

4 Paddle, R.N., "The Last Tasmanian Tiger; The History and Extinction of the Thylacine", Cambridge University Press, (2000).

5 Moeller, H. [letter dated 11 November 2007]. Although Moeller credits Churchill as the captor of the last thylacine he also stated that more research was needed to confirm this.

6 Sleightholme, S. & Ayliffe, N., "International Thylacine Specimen Database", Fourth Revision, DVD-Rom; Master copy: Zoological Society of London, (2011).

7 Dr David Howells Fleay (1907 – 1993).

8 Arthur Reid was the Head keeper at the Beaumaris Zoo [Domain Site].

sided up to me as I knelt in his cage and slyly attempted to add my leg to his bill of fare".

The opposite point of view, championed by Bob Paddle in his book *The Last Tasmanian Tiger - The History and Extinction of the Thylacine,* was that the last captive specimen was female. Paddle contends that none of the known photographs or indeed the Fleay film footage provide any indication that the thylacine was male. He notes that the scrotal sac of the male thylacine is pendulous and normally fairly evident when the animal is relaxed, and argues that it is reasonable to assume that the absence of such an obvious sign of maleness implies that the thylacine was female. Paddle states with reference to the Fleay film and to the photographs he credits as being those of the last captive specimen:

"At this stage it is worth introducing the idea that if the last thylacine specimen was genuinely called 'Benjamin'[9], then a dreadful accident must have happened to him in his youth. Male mammals frequently display important sexual characteristics in the vicinity of their hind legs. Although male thylacine possessed a pouch in which the testes were often carried, they were never permanently hidden from view. There is no evidence of the presence of testes in any of the surviving film or still photographs of the last thylacine specimen, these records suggest, in parallel with the size and shape of the head and body, that the last thylacine specimen was a mature, but still relatively young, adult female".

Anatomy

Frank E. Beddard (1891), prosector to the Zoological Society in London, dissected a male thylacine[10] and described both the brain and scrotal pouch in the Proceedings of the Zoological Society. Beddard was surprised to find a rudimentary pouch present in the male but recalled that Sir Richard Owen had observed this feature many years previously. Reginald I. Pocock (1926) in his paper "*The External Characteristics of Thylacinus*" published in the Proceedings of the Zoological Society states:

"The function of the scrotal pouch is to prevent the violent swinging of the scrotum which would take place if there was no restraint upon its movement when the thylacine was in swift pursuit of its prey. That injury to the testes might result from this swinging is suggested by the length and slenderness of the stalk like proximal portion of the scrotum by which the globular, testicular distal portion is suspended from the abdomen. Although in the Thylacinus the scrotal pouch both in its structure and position recalls the mammary pouch of the female, it is doubtful, in my opinion, if the two can be regarded as homologous structures".

The scrotal sac of the thylacine was sparsely covered with hair, possessed numerous sweat glands, and unlike that of its placental counterparts sat in a rudimentary cup-like pouch positioned anterior to the penis and centrally between the rear legs.

Figure 1. Preparation of the scrotal sac and pouch of the male thylacine Specimen: NMA 1984.0010.0706 MacKenzie Collection. Photo courtesy: National Museum of Australia. Source: International Thylacine Specimen Database [2011].

This can be clearly seen in a "wet" specimen of the scrotal sac within its pouch in the collection of the National Museum of Australia (see Fig.1). The cremaster muscle supported the scrotum by contracting and holding it tight against the body during cold weather and at times of stress, but relaxing and allowing the scrotum to fall when the weather was warm or after periods of strenuous activity. The pouch would have offered protection to the scrotum when hunting and undoubtedly had a role to play in thermoregulatory function. Contraction of the cremaster would also occur during moments of extreme fear, possibly to prevent injury to the testes when dealing with a fight or flight response.

Fleay's film evidence

Fleay's historic film footage of the last captive thylacine runs for 45 seconds[11] during which time the subject is seen seated, walking around the perimeter of its enclosure, yawning (exposing its impressive gape), sniffing the air, scratching itself (in the same manner as would a dog),

9 There is no evidence to support the belief that the last captive thylacine was named Benjamin.

10 Thylacine exhibited at the London Zoo from 14th November 1884 until 5th February 1890.

11 Source copy - http://www.naturalworlds.org/thylacine/films/flv/film_5.htm.

and lying down. At first view, there is as Paddle advocates, no evidence to suggest the animal is male. David Fleay entered the thylacine enclosure at the Beaumaris Zoo accompanied by the Head Keeper Arthur Reid to record his short film and to take a series of photographs. The presence of a stranger in such close proximity, together with all the cumbersome camera equipment, would no doubt have stressed the thylacine. As stated earlier, Fleay received a bite to his buttock from the thylacine during filming. The bite and the wide gape response seen on the film were guarded warnings that his presence was not welcome. In periods of stress, the scrotum would have been held tightly in the pouch and this would make casual observation of gender difficult. Assuming this to be so in the Fleay film, it would be improbable for evidence of gender to be observed when the thylacine was walking around its enclosure. This narrows the sections of film to two or three short sequences when the thylacine was either seated or lying down where evidence of gender could be sought. In one of these sequences, comprising 36 frames and commencing 18 seconds into the film (duration 1.5 seconds at 24fps), the thylacine is observed in a seated position in the act of displaying its gape. At this point its lower abdomen is clearly visible (see Fig.2, I - VI).

Figure 2. (I –VI) Seated gape sequence of 6 stills. Film courtesy: David Fleay Trustees

When frame III is enlarged the scrotum can clearly be seen, confirming the thylacine to be male (see Fig.3a). Using Microsoft Office® Picture Manager® the frame was then over exposed (20%) and the contrast increased (45%) so that the outline of the individual testes is discernable (see Fig.3b).

Figure 3. Enlargement (a) and overexposure (b) of Frame III with scrotum circled. Film courtesy: David Fleay Trustees

Conclusion

After going unnoticed for 77 years, the evidence provided by a short sequence of stills from Dr David Fleay's 1933 film, provides conclusive proof that the last captive thylacine was male.

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