

APHTHAE EPIZOOTICAE AMONG THE WISENTS (*BISON
BONASUS* L.) AND THE CROSS-BRED WISENTS (*BISON
BONASUS* L. × *BISON BISON* L.) OF THE ROYAL
ZOOLOGICAL SOCIETY "NATURA ARTIS MAGISTRA"
AT AMSTERDAM IN THE AUTUMN OF 1937

BY

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When in the summer of 1937 foot-and-mouth disease began to prevail among the cattle of Holland and spread rapidly in spite of extensive measures taken by the Dutch Veterinary Government Inspection, it was to be expected that also those animals in the Zoological Gardens, susceptible to this disease, would be affected.

Experience gained during earlier extensive foot-and-mouth-disease epizooticae has proved that this disease, singularly contagious for ruminants, could not be prevented notwithstanding the secluded spot occupied by these animals in the Zoological Gardens.

Perhaps it would have been possible to prevent infection by closing the Gardens to the public and forbidding the attendants to communicate with the outside world, but this could not very well be done for comprehensible reasons.

In "Artis" the way by which the infection of 1937 invaded the Gardens was easily traced. One of the attendants lives on a small farm, where foot-and-mouth disease had broken out already long before it was discovered in the Zoo. For personal reasons, irrelevant to this case, he had kept this quiet from the management. From September 6th till September 10th this attendant was on night-duty with the pregnant wisent-cow "ARTISINA" (when gestation is drawing to a close, an attendant is constantly on duty with these rare animals) and further from September 13th till September 21st he was on duty in the cow-house which is situated quite close to the wisent-enclosure, while from September 23rd till September 27th he was again on night-duty with the pregnant wisent-cow.

Since the same attendant also acted as a deputy in the kangaroo-house in the immediate vicinity of the mouflon- and tedal-reservations foot-and-mouth disease broke out here too. It was also easy to make out by which way the other animals which all showed to a more or less serious degree the symptoms of foot-and-mouth disease (loss of appetite, stiffness, dribbling) have been

infected (American bisons, Livingstone's eland antelopes, naked-eared deer, red brockets, fallow deer and one red deer (though this last case was doubtful)). As a matter of course also most of the other ruminants in the cow-house have been attacked (African and Indian buffaloes and one gayal; only the bantengs or sondaic oxes, the zebu's or domestic humped oxes, the watoossicattle, two Indian buffaloes and one gayal remained unattacked while one African buffalo with the above mentioned red deer were put down amongst the doubtful cases).

The courses of the foot-and-mouth disease of these animals however are left here out of regard.

As early as September 23rd a certain stiffness was observed with the wisent-cow "ARTISINA" while occasionally the typical smacking sound which the animals make with their mouths during the forming of blisters on the tongue and the mucous membrane was heard by the attendant.

On September 24th symptoms also appeared with the bastard "WIESJE" residing in the cow-house. This animal, too, showed stiffness when walking and profuse salivation (foam at the mouth). With these patients bodily examination was impossible.

In connection with the difficult temper of "WIESJE" and the great number of animals in the enclosures isolation was hardly possible. The cow stayed in the enclosure separated by a railing from the other enclosures, populated with kindred animals, and refused to enter the shed in which it was to be isolated.

The calf, expected from the cow "ARTISINA", was born on September 27th 1937, immediately therefore after the cow had sustained the infection. Since it is known that especially new-born calves succumb to the disease and because it was of great importance for us to save this calf—which was christened "ARSÈNE" and registered as N° 288 in the Pure Breed Register of the International Society for the Preservation of the Wisent—it was subcutaneously injected a few hours after its birth already with 100 cc. of highly immune serum against aphthae, kindly supplied to us by the Government Serum Institute of Rotterdam. It did not cause the slightest inconvenience to the young animal. These injections were repeated each time with 100 cc. of serum on October 8th and 20th, November 1st, 13th and 25th and December 7th and 20th.

In catching the calf which was therefore separated from its mother a few moments before, ever growing difficulties were met with. Injecting large quantities of serum under the tight skin had its technical difficulties, but the good results obtained with calves in infected cow-houses when using the serum of the Government Serum Institute were again corroborated; the calf remained completely healthy and gained weight quite normally, whereas all the animals in the adjacent enclosures were ill and the calf was polluted through the railing by the strongly foaming animals. The immunity acquired is of a short duration only, so that administering the remedy was continued long after the last case of foot-and-mouth disease had recovered.

The progress of the epizooty which made many victims among the cattle of Holland owing to the malignant nature of the virus was watched with great anxiety by the management of the Zoo. Among the seven thorough-bred wisent were the old bull "SCHALJAPIN" and the cow "ARTISINA" which was, as already mentioned, in an advanced stage of pregnancy. With these animals, bodily treatment, in casu injections, treatment of inflamed parts of the mouth and administering of medicine was out of the question. The only things one could do was dieting them and taking rigorous hygienic measures. All this made the epizooty very undesirable.

Every day the symptoms of the foot-and-mouth-disease infection observed with the various animals were recorded with the greatest accuracy in the daily reports in which all particulars of the inhabitants of the Zoo are taken down. In this way it became possible to get a general review of all the facts concerning the wisents and bastard-wisents as recorded during the epizooty.

A synopsis follows below, first of the thorough-bred wisents, then of the cross-bred wisents, each species in chronological order of occurrence of symptoms of the foot-and-mouth-disease infection.

A. THE THOROUGH-BRED WISENTS

I

"ARTISINA" ♀. N° 218 of the Pure Breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on July 12th 1932.

We may assume, with practically absolute certainty that this wisent was the first to experience a slight infection without pronounced symptoms on September 23rd. The next day already the animal did not show any more symptoms of foot-and-mouth disease.

II

"BEATRICE" ♀. N° 20 of the Pure Breed Register of the International Society for the Preservation of the Wisent. Born in Berlin on July 21th 1915.

On September 27th the animal had no appetite but no further symptoms of foot-and-mouth disease were observed.

III

"BERND" ♂. N° 192 of the Pure Breed Register of the International Society for the Preservation of the Wisent. Born in Berlin on July 10th 1930.

On September 27th this bull also showed loss of appetite. Stiffness when walking was not observed neither was foaming at the mouth. On October 5th the animal was normal again, rolled in the sand and had an excellent appetite.

Although it may be assumed that it was a case of foot-and-mouth disease I put it down amongst the doubtful cases.

IV

"ARLETTE" ♀. N° 259 of the Pure Breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on May 30th 1936.

September 30th. The cow started to foam at the mouth and had no appetite.

October 3rd. The cow was emaciated and weak.

October 6th. The appetite returned.

October 9th. The cow even ate some hay.

October 12th. Normal food was supplied again.

October 13th. The abnormal salivation disappeared. Animal recovered.

V

"SCHALJAPIN". ♂ N° III of the Pure Breed Register of the International Society for the Preservation of the Wisent. Born in Scharbow on November 6th 1919.

Although it may be assumed that this colossus had gone through more than one foot-and-mouth-disease infection he was the only one that died of the effects of this disease, i.e. severe septic enteritis. Treatment of the animal was out of the question as it would not allow any one to touch it.

October 1st. The first symptoms of foot-and-mouth disease, lassitude and stiffness, were observed.

October 3rd. The bull only took some water with some linseed-meal and was smacking and foaming, colour of the flowing saliva light-red, somewhat bloody. The conjunctivae were badly inflamed, with white discharge.

October 4th. The animal was very listless, smacked continuously, discharging slime mixed with blood. Discharge of yellowish slime from the eyes.

October 5th. Condition the same; defaecation difficult: a little hard dry faeces.

October 6th. A little wound on the base of the nose (ruptured blister?). The foaming decreased.

October 7th. The foaming increased.

October 8th. The foaming decreased. Eyes improving, with less discharge.

October 9th. See above.

October 10th. Thin faeces, mixed with intestine slime.

October 11th. The foaming had stopped. The animal still refused food, its emaciation was striking.

October 12th. The animal ate a little linseed-cake and drunk linseed-meal mash.

October 13th. Very little appetite, intake of linseed-meal mash was not nearly sufficient.

October 15th. Strong slime-discharge from the nose.

October 16th. General condition much better, the animal was more thriving though still smacked while chewing, but had no slime-discharge. It ate a few lettuce leaves, tomatoes, bananas, white bread and some hay. Thin faeces.

October 17th. The animal ate very little but drunk 5 litres of milk diluted with 5 litres of water. Normal faeces without the red glow.

October 18th. The animal drunk well and ate some hay but refused lettuce, bananas, tomatoes, bread and carrots. It walked stronger.

October 19th. It drunk milk diluted with water and also took some sugarpulp.

October 20th. It drunk the same mixture of milk and water and ate a little pulp.

October 21th. It drunk 9 litres of unskimmed milk, ate $\frac{1}{4}$ pail of pulp and one or two acorns.

October 22th. It drunk 8 litres of unskimmed milk, took about 1 K.G. crushed oats and barley; refused linseed-cake.

October 23rd. It drunk 6 litres of unskimmed milk, ate $\frac{1}{2}$ K.G. of additional food (bran, barley, oats) but refused pulp.

October 24th. It drunk about 6 litres of milk diluted with water, ate $\frac{1}{2}$ K.G. of additional food.

October 25th. It drunk 12 litres of milk diluted with water, ate almost no additional food.

October 26th. It drunk the same as on the previous day, ate a little hay but no additional food.

October 27th. It drunk about 11 litres of milk diluted with water, ate $\frac{1}{4}$ K.G. oat-meal porridge, refused additional food and hay.

October 28th. It drunk 8 litres of milk, 6 litres of water and ate some oat-meal porridge; showed general condition of weakness, could not rise, eyes dim.

October 29th. It died at about 1 p.m. The post-mortem examination showed a septic enteritis.

VI

"ARTEMIS" ♀. N^o 260 of the Pure Breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on June 14th 1936.

October 3rd. The cow showed the first symptoms of foot-and-mouth disease: loss of appetite, dribbling, inclination to lie down and stiffness.

October 9th. It ate again a little hay.

October 11th. It was still foaming.

October 12th. Ditto.

October 13th. It stopped foaming.

October 14th. Appetite much better.

October 15th. The cow was put again on full food. Entirely recovered.

VII

"ARCOMES" ♂. N^o 244 of the Pure Breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on September 18th 1934.

October 6th. The bull showed the first symptoms of foot-and-mouth disease: dribbling and stiffness.

October 7th. Discharge of the conjunctivae, but less pronounced than was the case with "SCHALJAPIN".

October 9th. General weakness, emaciation was very pronounced.

October 10th. The animal was foaming strongly.

October 12th. Ditto.

October 13th. Ditto.

October 15th. The animal was still foaming but the stiffness was decreasing.

October 16th. The foaming was restricted to the dribbling of slimy saliva. General condition greatly improved: the animal was more thriving and butting.

October 17th. The foaming still went on; the animal took a little food.

October 18th. Normal food supplied again.

October 19th. The animal was still dribbling a little.

October 20th. The foaming had stopped.

October 22nd. In the enclosure of "ARCOMES" and the two cross-bred wisents "MIEPJE" and "SIENTJE" again some flakes of foam were observed. As none of these three animals however showed any more foaming it was not possible to make out by which of the three these flakes were produced and as besides also all other symptoms of foot-and-mouth disease had disappeared it is very doubtful if these flakes of foam had still anything to do with foot-and-mouth disease. Even on November 7th some foam was still observed in this enclosure but that the animals were still labouring under the foot-and-mouth disease was out of the question.

B. THE CROSS-BRED WISENTS

Only the cows of the cross-bred wisents are incorporated in classes as the bulls of the cross-bred wisents are of no value for the breeding.

Class I: ♂ *Bison bonasus* L. × ♀ *Bison bison* L.

Class II: ♂ *Bison bonasus* L. × ♀ (♂ *Bison bonasus* L. × ♀ *Bison bison* L.); *a.s.o.*

I

"WIESJE" ♀. Cass. I. N° 64 of the Cross-breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on April 19th 1930.

September 24th. The cow showed the first symptoms of foot-and-mouth disease: stiffness and dribbling. As already stated it refused to enter the shed in which it was to be isolated.

October 1st. The foaming and salivation had stopped and the lost appetite returned.

October 3rd. The appetite was satisfactory again. Animal recovered.

II

"STIENEKE" ♀. Class I. N° 86 of the Cross-breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on August 14th 1931.

September 25th. The cow, residing in the same enclosure as "WIESJE" and "BERND", was observed to suffer from foot-and-mouth disease.

October 3rd. The animal almost ceased from foaming and began to eat again.

October 5th. The animal still ate sparingly and showed from time to time some foam at the mouth.

October 9th. It was still foaming and had no appetite worth mentioning.

October 10th. It began to eat some hay.

October 11th. Normal quantity of food supplied again. Animal recovered.

III

"SIENTJE" ♀. Cass II. N° 133 of the Cross-breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on March 29th 1934.

October 6th. The cow, residing in the same enclosure as "MIEPJE" and "ARCOMES", showed the first symptoms of foot-and-mouth disease.

October 10th. The cow was still dribbling.

October 11th. Ditto. Moreover discharge from the eyes.

October 12th. The cow was still foaming.

October 13th. The foaming was very slight.

October 15th. Ditto. Legs stiff.

October 16th, 17th, 18th. Normal quantity of food supplied again. Appetite satisfactory.

October 21st. Though the foaming had ceased completely the legs were more stiff than ever.

October 22nd. See: "ARCOMES", October 22nd.

IV

"MIEPJE" ♀. Class II. N° 143 of the Cross-breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on May 3rd 1935.

October 7th. The cow, residing in the same enclosure as "SIENTJE" and "ARCOMES", showed stiffness.

October 10th. It was foaming.

October 11th. Ditto. Moreover discharge from the eyes.

October 12th. The cow was foaming to an excessive degree.

October 13th. The foaming had almost stopped.

October 17th. The appetite returned.

October 18th. Normal quantity of food supplied again.

October 22nd. See: "ARCOMES", October 22nd.

V

"LIENTJE" ♀. Class II. N° 198 of the Cross-breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on August 16th 1936.

October 10th. The cow ate no additional food, was foaming and smacking and lost much saliva from the nose.

October 11th. Ditto. The cow is apathetic.

October 12th. The foaming was very pronounced. The animal was put in the same enclosure with "DAVID" and notwithstanding the distemper butted playfully for a while.

October 13th. It was still foaming.

October 17th. It was hankering for food again.

VI

"DAVID" ♂. ♂ *Bison bonasus* L. × ♀ (♂ *Bison bonasus* L. × ♀ *Bison bison* L.) N° 199 of the Cross-breed Register of the International Society for the Preservation of the Wisent. Born in Amsterdam on December 12th 1936.

The course of the foot-and-mouth disease of this bull was almost the same as that of "LIENTJE".

October 15th. It was still foaming strongly but the legs were less stiff.

October 21st. Normal quantity of food was supplied again.

Chronological order of occurrence of symptoms of the foot-and-mouth-disease infection.

	<i>Disease broke out on</i>	<i>Recovered on</i>	<i>Died on</i>
W = wisent C = cross-bred wisent			
"ARTISINA" (W)	Sept. 23rd/24th	Sept. 25th	
"WIESJE" (C)	Sept. 24th	Oct. 3rd	
"STIENEKE" (C)	Sept. 25th	Oct. 11th	
"BEATRICE" (W)	Sept. 27th	Sept. 28th	
	(doubtful case)		
"BERND" (W)	Sept. 27th	Oct. 5th	
	(doubtful case)		
"ARLETTE" (W)	Sept. 30th	Oct. 13th	
"SCHALJAPIN" (W)	Oct. 1st	—	Oct. 29th
"ARTEMIS" (W)	Oct. 3rd	Oct. 15th	
"ARCOMES" (W)	Oct. 6th	Oct. 22nd?	
"SIENTJE" (C)	Oct. 6th	Oct. 22nd?	
"MIEPJE" (C)	Oct. 7th	Oct. 22nd?	
"LIENTJE" (C)	Oct. 10th	Oct. 17th	
"DAVID" (C)	Oct. 10th	Oct. 21st	