

**Necropsy Report**  
**Killer Whale (Orcinus-orca) Kilroy**  
Age 13 yrs — SeaWorld of California

**Name:** Kilroy (male)

**Species:** Killer Whale (Orcinus orca)

**Source:** wild capture, February 1967, Yukon Harbor, WA, USA, age: est. 2 yrs

**Deceased:** 5:10 a.m., 09-23-1978, SeaWorld of California, age: est. 13 yrs

**Reported cause of death** (per NMFS MMIR data): Gangrenous Pneumonia

**Necropsy info:**

Preliminary diagnosis- Lanny H. Cornell, DVM , Lynn A. Griner, DVM (1978):  
Overwhelming septicemia and gangrenous/mycotic pneumonia.

Diagnosis- Lanny H. Cornell, DVM , Lynn A. Griner, DVM (1978):  
Gangrenous pneumonia, pulmonary edema and mycotic myocarditis.

**Notes:** Prior to reforms of the Marine Mammal Protection Act (MMPA) in 1994, holders of marine mammals for public display were required to submit necropsy reports (animal autopsy reports) for deceased animals, making the documents available to the public and scientific community. Presently, marine mammal parks in the U.S. are only required to provide a “cause of death” to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) which maintains Marine Mammal Inventory Reports (MMIR). Details of marine mammal deaths are now a closely guarded secret at U.S. entertainment facilities.

The Orca Project acquired the following documents from the National Marine Fisheries Service (U.S.A) via the Freedom of Information Act for deaths that occurred prior to implementation of the 1994 MMPA changes.

For more information visit [www.theorcaproject.com](http://www.theorcaproject.com)

Necropsy, Autopsy, Veterinarian, NOAA, NMFS, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, MMIR, Marine Mammal Inventory Report, MMPA, Marine Mammal Protection Act, Killer Whale, Orca, Shamu, Death, Die, SeaWorld, San Diego, California, Kilroy

SEA WORLD, INC.

SAN DIEGO, CALIFORNIA

NECROPSY REPORT

*pre-Act  
reported P26*

PATH. NO.: SW 78054

IMAL NAME: Kilroy

I.D. NO.: KW 72

NUS/SPECIES: Orcinus orca

SEX: M F

TE/TIME OF DEATH: 9/23/78 5:10 a.m.

TE/TIME OF NECROPSY: 9/23/78 (P.M.)

INICAL HISTORY PRIOR TO DEATH:

ROSS NECROPSY FINDINGS:

IGHT: 4,130 lbs.

LENGTH: 558 cm

GIRTH:

Integument: The ventral aspect and distal tips of the fluke are moderately abraded. There is a moderate to severe slough over most of the dermis. There are rubbing abrasions on the mandibular ventrum.

Respiratory System: The region just proximal to the bifurcation of the trachea is lined with a white, cheesy thick substance which emits of foul odor. The trachea is filled with a pink, frothy foam. The mucosa is markedly hyperemic. The lungs are gray-tannish brown with a mottled appearance and are very edematous. The capsule is smooth but the parenchyma is lumpy. The lungs are meaty, heavy spongy and exude a yellow mucosal substance from the parenchyma and bronchioles. On cut section there is moderate to severe congestion with moderate consolidation in both distal regions. The left lung has a green-brown gangrenous area about 4 cm. x 8 cm. x 5 cm. and has a much more extensive degree of consolidation.

Digestive System: There is a whitish-gray thick necrotic appearance to the oral mucosa. The esophagus reveals no significant lesions. The forestomach is partially filled with ingesta. The mucosa is white, thickened and easily peeled off the submucosa. The glandular stomach reveals no significant lesions. The small intestine reveals no significant lesions and the lumen is filled with a yellow-green mucoid ingesta with a normal mucosa. The large intestine reveals no significant lesions and the lumen contains a brown mucoid ingesta with a normal mucosa. The liver is dark reddish-black, moderately enlarged with moderately swollen edges. On cut section there is severe congestion, a dark nutmeg appearance and the parenchyma is moderately friable.

Urinary System: The kidneys are tan-brown, firm with normal lobulation, shape, size and consistency. On cut section there is moderate congestion and the lobules reveal no significant lesions. The bladder reveals no significant lesions.

Musculoskeletal System: There is a severe generalized weight loss. In the region dorsal to the skull and cervical vertebra the musculature is pale brown instead of the normal dark red.

Endocrine and Exocrine System: The pancreas reveals no significant lesions. The adrenal glands are brown-tan, firm, of normal shape and consistency. On cut section there is moderate darkening at the corticomedullary junction.

Lymphatic System: The mandibular, prescapular, mediastinal and bronchial lymph nodes are moderately enlarged, firm and gray-tan. On cut section the parenchyma is gray-brown with very dark black areas in the medullary region. The spleen is purplish-red, soft and moderately enlarged. On cut section there is evidence of severe congestion.

Cardiovascular System: The pericardial sac is moderately to severely distended with about 1 liter of a yellow cloudy seromucoid fluid. The myocardium appears to be flaccid, especially the right side. The myocardium is pale brownish-red and on the cut section there are numerous small (about 2 mm - 15 mm in diameter) focal white firm lesions throughout the left ventricle, chordae tendineae and interventricular septum. The valves reveal no significant lesions.

Reproductive System: No significant lesions.

Nervous System: There are numerous dural adhesions on the cerebrum. Also there is moderate subdural hemorrhage and meningeal inflammation. There is moderate to severe subdural hemorrhage on the cerebellum and brain stem. There is moderate to severe hyperemia over the dorsum of the cerebellum and the cerebrum. The brain was formalized and will be histologically sectioned for further examination.

BY: 

SEA WORLD, INC.

SAN DIEGO, CALIFORNIA

NECROPSY REPORT

PATH. NO.: SW 78054

ANIMAL NAME: Kilroy

I.D. NO.: KW 72

GENUS/SPECIES: O. orca

SEX: M X F

DATE/TIME OF DEATH: 9/23/78 5:10 a.m.

DATE/TIME OF NECROPSY: 9/23/78 (P.M.)

CLINICAL HISTORY PRIOR TO DEATH:

Abnormal behavior and anorexia were noted about 8/15/78. Examination and lab work were done and treatment was instituted. Increased respiratory rate, dyspnea and a foul odor from blow hole were noted. Treatment was continued with little improvement. Condition and activity continued to decline and tube feeding was implemented. Animal died on 9/23/78.

GROSS NECROPSY FINDINGS:

WEIGHT: 4,130 lbs.

LENGTH: 558 cm

GIRTH: \_\_\_\_\_

Cardiovascular System: Both right and left ventricles appear to be dilated. The musculature was somewhat flacid. On incision of the myocardium, especially of the left ventricle, and in the chordae tendineae, numerous pale to white areas were observed. These lesions were firm, suggestive of scar tissue. They were sometimes nodular and could be seen on the endocardial surface. The larger lesions were seen in the interventricular septum. Lesions were not observed in the right ventricle. The atria appeared normal.

Respiratory System: The right lung was edematous. A great deal of froth, guineous fluid came from the trachea and bronchi. Incision of the lung, especially in the posterior or diaphragmatic portion of the dorsal part of that lobe, several small abscesses were observed. There also appeared to be multiple areas of bronchopneumonia. Some portions of the lung were extremely dark in color, congested. The lung itself was very edematous. The left lung had a large number of focal areas of necrosis and gangrene. They were seen in nearly all portions of the lung. The more severe lesion was located in the diaphragmatic dorsal aspect of the lung. A lesion that was situated ventral to the trachea and bronchi indicated a lesion of perhaps longer

uration. It was pale, appeared to be fibrous. The other lesions, especially those in the dorsal aspect of the lung were believed to be fairly recent. They could best be described as irregular areas of necrosis and what appears to be gangrene.

Hematopoietic System: The mediastinal and bronchial lymph nodes are juicy, perhaps somewhat congested or hemorrhagic. There also appears to be perhaps small areas of necrosis or fibrosis. Other lymph nodes such as the prescapular were showing similar lesions.

Digestive System: The liver is pale in color, cuts with moderate ease. There is perhaps some autolysis. The liver, though, is somewhat remarkable by its paleness of color. The genital system, both right and left kidneys were extremely pale, blanched and usually the hyler portion of each of the lobules was pale to yellowish in color. No growth lesions were observed in the organ. No further lesions were observed.

PATH. NO. SW 78054

I.D. NO. KW 72

SITES:

<u>N/TISSUE</u>	<u>STAGE</u>	<u>SPECIES</u>	<u>DESCRIPTION</u>
found.			

URES TAKEN:

<u>N/TISSUE</u>	<u>I.D.</u>
lung	
lung	
kidney	
kidney	
er	
cardial fluid	

HISTO TAKEN:

liver	cardiac muscle
lung	skeletal muscle
kidney	eyes
spleen	
pancreas	
adrenal gland	
lymph node	

DIAGNOSIS: Overwhelming septicemia and gangrenous/mycotic pneumonia. (Waiting for histo and bacteriology for confirmation.)

BY: LYNN GRINER DVM PhD

P2

10-12-78

HISTOPATHOLOGY REPORT ON "KILROY" .. KILLER WHALE #72 SEAWORLD, SAN DIEGO

**CARDIOVASCULAR SYSTEM:** The heart: Sections of the heart reveal that many of the myocardial fibers are thin, apparently with some atrophy, and such fibers are frequently separated by areas of connective tissue, indicating that there has been some myocardial degeneration and scar formation. These lesions are rather widely scattered in the sections being examined. The lesions however of greatest significance are those of a myocarditis, which are characterized by necrosis, degeneration of myocardial fibers and a minimal infiltration of polymorphonuclear leukocytes and lymphocytes. The most striking feature of the lesion is the presence of numerous mycotic or yeast bodies. Most of the cells are spherical or ovate in shape and vary greatly in size. In addition to the yeast-like organisms, mycelia can be seen. It does appear that some of the mycelia are septate. Sections stained by the PAS method, failed to supply additional clues as to the identity of the organisms. Candidia should probably be considered as one of the micro-organisms; however, there may be more than one mycotic agent.

**RESPIRATORY SYSTEM:** The lung: There is considerable variation in the lesions observed from various sections of the lung. They range from areas of necrosis, with gangrene of the lung, to other portions of the lung that are severely congested and contain a few neutrophils but are near normal. In between these extremes it can be seen that portions of the lung are extremely edematous. In the gangrenous lung there are large areas of frank necrosis, in which can be seen many colonies of bacteria, both bacilli and cocci. Polymorphonuclear leukocytes have infiltrated the tissue, especially near the junction with viable pulmonary tissue, and there are also zones of congestion and hemorrhage. In the areas of severe pulmonary edema, all alveoli and bronchi are greatly distended with homogeneous, eosinophilic staining material, presumed to be plasma. Moderate numbers of granulocytes are present and occasionally small colonies of bacteria. It is very interesting to note the absence of mycotic or yeast-like organisms in the pulmonary tissue.

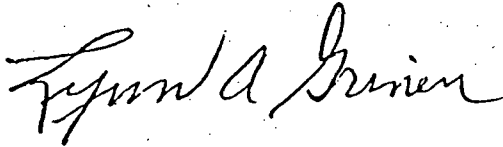
**DIGESTIVE SYSTEM:** The liver: There has been considerable autolysis of the liver. Colonies of bacteria are frequently observed, both in the parenchyma and in the central veins. They can also be found in and around the bile ducts. It is believed that a good portion of these bacteria are post mortem proliferating cells.

**HEMOPOIETIC SYSTEM:** The spleen is characterized by an obvious paucity of lymphocytes. The germinal centers do not appear to be active. The lymph sinuses are distended. Sections of the spleen also reveal that there is a suppression of lymphopoiesis. This would indicate that the immune status of the animal had been reduced. Colonies of bacteria can also be seen in these tissues.

**UROGENITAL SYSTEM:** The kidney: The sections examined indicate that the kidneys are normal, with the exception of some autolysis.

DIAGNOSIS: Gangrenous pneumonia, pulmonary edema and mycotic myocarditis.

COMMENTS: The absence of the fungi or yeast in other tissues would indicate that the myocarditis is of a separate disease entity. PAS stains were made of the heart sections but they failed to help differentiate or identify the organism. I am taking some photo micrographs which I will supply to you, along with the slides, at a later date.



Lynn A. Griner, D.V.M., Ph.D



ality

stances of stranding, death, etc.

ernal description (carcass condition, wounds, scars, pigmentation, color)

; photo record: Drawings (on Second Page)

th or baleen counts: Upper left Upper right Lower left Lower right

meter largest tooth Color of baleen

ments (wear, etc).

EXTERNAL MEASUREMENTS

TRUCTIONS:

measurements, except those marked with an \*, are taken in a straight line parallel to the body axis. The marked ones are taken point to point. Indi- if done otherwise. Measure to the center of the apertures. Measurement shown by number on the drawings on the second page. Fill out a separate for fetuses.

Units of Measure (Metric System Preferred) cm

- Tip to: 1) apex of melon 25 2) angle of mouth 61 3) center of eye 66 4) posterior margin of blowhole 81 5) ear 91 6) posterior extremity of throat grooves N/A 7) pectoral flipper (anterior insertion) 110 8) dorsal fin base center 275 9) dorsal fin tip 332 10) center of umbilicus 245 11) center of genital slit 330 12) center of mammary slit 356 13) anus 374 14) fluke notch (total length) ventral 558 15) rostral, at apex of melon 16) at eye 17) immediately behind pectoral flipper 18) maximum distance from snout tip 19) at anus 20) midway anus to fluke notch Peduncles 21) height, midway anus to fluke notch\* 54 22) thickness, same place\* 23) projection lower jaw beyond upper reversed (state if reversed) 6 24) distance of eye to ear 28

- 28) Eye aperture length 6 29) Blowhole lengths Right 5.5 Left 5 30) Blowhole maximum width 11.5 31) Diameter of ear opening Right PP Left PP 32) Diameter of head between eyes\* Throat & Ventral Grooves 33) number Throat Ventral (between pees) 34) maximum length 35) minimum length Mammary Slit 36) number 2 37) length Right 1.1 Left 1.8 38) distance between them 4.2 39) Genital slit length 36 40) Anal slit length 6 41) Distance between anal and genital slits (males) 30 Flipper 42) anterior length\* (right) 101 43) posterior length 80 44) maximum width\* 52 Dorsal Fin 45) height\* 72 46) base length 73 Fluke 47) width tip to tip\* 164 48) right lobe, tip to notch\* P2

Weights (Units Used \_\_\_\_\_)

act Carcass \_\_\_\_\_ Muscle \_\_\_\_\_ Blubber \_\_\_\_\_  
cera \_\_\_\_\_ Bone \_\_\_\_\_

Internal Measurements, Observations, Etc.

ernal Organs, etc: Weights, and/or measurements (L/W/D) and/or Remarks:

ubber: depth at midlength:

Middorsal 6 cm Midlateral 4.5 cm Midventral 5 cm

cle

ural Cavity

ominal Cavity

ohrahm

. Cavity

Sacs, Nasal Sinuses

oid 2.5 lbs.

us

nx, Trachea, Bronchi

s, Right 49 lbs.

Left 59 lbs.

rdium

t 35 lbs..

Bladder, Bile Duct

r 100.5 lbs. The liver is very pale

en 2 lbs.

reas

nals, Right

Left

ys, Right 13.5 lbs. kidney

Left 13 lbs.

Nodes

s

act (general comments)

agus

(Distinguish fore, main and pyloric: include condition and quantity in contents description).