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### Cape tulip control

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# *Actinomycosis and Actinobacillosis*

By J. SHILKIN, B.V.Sc., H.D.A., Senior Veterinary Surgeon.

**A**CTINOMYCOSIS and actinobacillosis, commonly known as "lumpy jaw" and "wooden tongue" respectively, are chronic infective diseases which are most commonly encountered in cattle, occasionally in pigs, and much less frequently in the other domestic animals and man. They are characterised by the presence of tumour-like swellings and exude pus containing yellow sulphur-like granules. These swellings are commonly found in or on the jawbones and tongue, but may be found on occasions, in other parts of the body such as the lungs, liver, spleen, etc.

For a number of years it was generally believed that the particular type of fungus (*Actinomyces bovis*), commonly referred to as the "ray fungus" from its manner of growth, was the causative organism of actinomycosis or "lumpy jaw," but it has since been determined that this organism plays little or no part in the disease. It is now considered that several forms of bacteria produce the condition chiefly one known as *Actinomyces*, or *Streptothrix israeli*. *Bacillus pyogenes* may also produce a somewhat similar condition in the jaw.

Actinobacillosis or "wooden tongue" is generally caused by an organism known as *Actinobacillus lignieresii* while a similar condition which sometimes occurs in the udders of cows, is almost solely caused by the organism known as *Staphylococci pyogenes aureus*.

## METHOD OF INFECTION

The method of infection is not fully understood. The fungus previously regarded as causative is found on the soil and grass, and it was considered that it gained entry on grass seeds such as barley grass. Since it has been found, however, that this fungus is non-pathogenic, and that infection is due to other bacteria, ideas regarding methods of infection have had to be revised. It is now considered that the organisms responsible may commonly be present

in the upper air passages and intestines, and that when conditions are favourable, such as through loosening of teeth, or laceration of gums, cheeks, mucous membranes of the bowel walls etc., they gain entry to the tissues and become established.

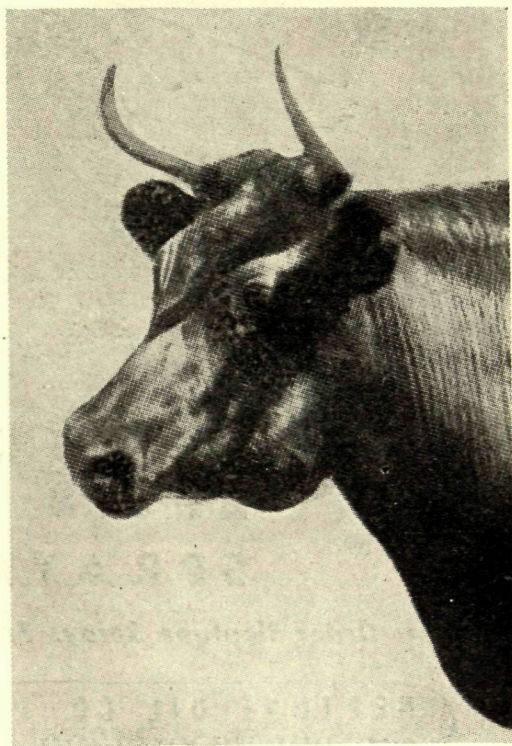


Fig. 1.—A typical case of "Lumpy jaw."



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## SYMPTOMS

The commonest lesion of actinomycosis is found in the bones of the jaw, either upper or lower. The spongy tissue of the bones is replaced by tumour-like formations consisting largely of connective tissue. Pus is formed in the pockets of the diseased tissue and in appearance it is granular, thick and yellow, greyish-yellow or greenish-yellow in colour. The framework of the bone is partially softened and the growth of inflammatory tissue separates the outer layers of the bone from each other, so that the bone appears distended.

In the early stages the swelling is hardly perceptible, but with the progress of the disease, large swellings may develop with masses of affected tissue appearing through the skin or along the gums. At the same time adjacent tissues such as the submaxillary or parotid lymph glands or the tissues of the throat may be involved, and the resultant swelling may interfere with respiration.

Whilst the swelling is small there is usually little interference with the health of the animal. Later, however, the swelling may make eating difficult or almost impossible, and swelling in the throat region may so interfere with respiration as to cause the animal considerable distress. At this stage there is marked loss of condition, increasing weakness, followed by death.

The commonest lesions of actinobacillosis are in the tongue or surrounding tissues in the mouth or throat. In the tongue the earliest evidence of the disease is usually found in the top of the organ just in front of the ridge. It is here that penetrating grass seeds from the feed are most likely to become lodged, enabling the causative organisms to gain entrance. A greyish-yellow ulcer may first develop at this site on the surface, or deep seated abscesses, which are not visible, may develop in the tissues of the tongue itself.

As the disease progresses the tongue becomes increasingly stiff and sore, the entire muscle of the organ being infiltrated with fibrous tissue and small abscesses ranging from the size of millet seeds to that of small walnuts. Eating becomes difficult, and the tongue protrudes from the mouth.

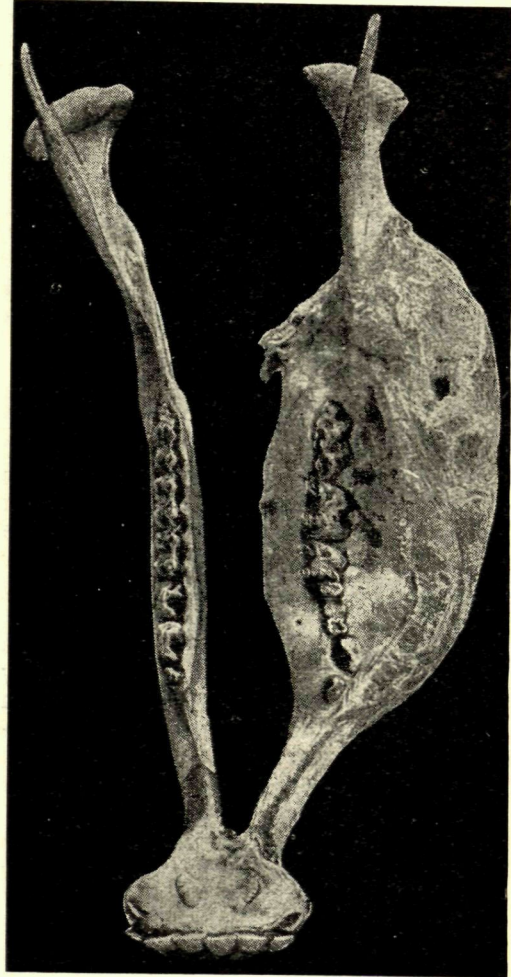


Fig. 2.—Skeleton of the lower jaw of a bullock suffering from actinomycosis, showing how the growth of inflammatory tissue separates the layers of bone from each other and distends the jawbone.

## DIFFERENTIAL DIAGNOSIS

It is possible to confuse actinomycosis with grass seed abscess and tuberculosis of the head and throat. However,



grass seed abscesses have a rapid development and cause considerable pain due to the acute inflammatory reaction, whereas both actinomycosis and tuberculosis are slow-developing conditions with little or no pain being apparent. Where the abscess resulting from grass seed penetration has become chronic there may be considerable difficulty in differentiating the condition. Tuberculosis can be differentiated from both conditions by means of the tuberculin test. In the case of both actinomycosis and T.B., where the abscess or abscesses have broken the outside skin and are discharging, healing does not take place. An occasional abscess may close up temporarily only to open again in a variable period. Grass seed abscesses, once open and draining well, will usually clear up even without treatment.

### **TREATMENT OF ACTINOMYCOSIS**

Actinomycosis may be treated under some circumstances by surgical means involving removal of the growth. In the majority of cases, however, the disease would be too far advanced for surgery by the time the condition was observed.

For many years iodine preparations have been used both by mouth and by intravenous injection, but results with actinomycosis have been rather disappointing, and most cases of the disease eventually find their way to the butcher.

Recent experimental work with some of the newer antibiotics, particularly streptomycin, have been encouraging, and it is possible that early treatment with some of them will save many affected animals.

### **TREATMENT OF ACTINOBACILLOSIS**

Treatment of actinobacillosis with iodine preparations has given better results than those experienced with actinomycosis. Potassium iodide is given in the drinking water in doses of 1/6 to 1/3 ounce daily for adult cattle. This

is continued for from 2 to 4 weeks, but watch must be kept for symptoms of iodism or iodine poisoning. These include nasal and eye discharges, skin eruptions, falling of the hair and loss of condition. If any of these symptoms be noticed, the iodine administration should be discontinued for six or seven days and then recommenced.

Intravenous administration of sodium iodide is more effective than the administration of potassium iodide by the mouth, but should preferably be administered by a veterinary surgeon. One injection will frequently result in a complete cure in a matter of weeks.

The organism is only slightly sensitive to penicillin, but the sulphonamide drugs, particularly sulphapyridine, sulphamezathine, and sulphathiazole, appear to have a marked effect against it, and it is possible that further work will indicate a satisfactory farm treatment using one of these drugs.

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## **CAPE TULIP CONTROL**

**S**TRONG measures will be taken this season to control the spread of Cape Tulip in Western Australia.

There is ample evidence to show that the spread of Cape Tulip has been due, to no small extent, to the movement of infested farm produce particularly hay and chaff. The movement of any declared noxious weed from one district to another is a contravention of the Noxious Weeds Act and a ban will be placed on the movement of hay or chaff containing seeds or corms of Cape Tulip.

In districts where the weed is firmly established over large areas, a degree of control is the most that can be expected in the immediate future and the immediate programme will be directed against preventing distribution from these areas. In other localities where only small patches of the weed exist, eradication is possible and efforts will be made to this end.