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MATERIALS FOR DETERMINING THE AGE OF REINDEER BY THEIR TEETH

reindeer herding natives it is not necessary for them to recognize the reindeer by other characteristics fairly accurately for up to a year.
By C. A. Gruiner

In recent times there have frequently appeared papers and notes on reindeer management, insufficiently proven, superficially treated, impractical and ill-founded.

To such conclusions of A. Mishin. Of the reported species in the deer family p. 8-30, by A. F. Mishin, "A study on determining the age of reindeer by the incisors of the lower jaw". The author ventures to publish, having at his disposal a collection of 42 lower jaws of reindeer but at the same time not having sufficient observations, but only on the basis of the indications of the veterinarian, Colntsyra and on that of some natives. He boldly produced ill-founded conclusions.

I, myself, have a collection of more than 200 lower jaws of reindeer gathered personally at various locations in the north (on a required annual journey). The material is being gradually collected and at the moment it is premature to publish. But the incorrect conclusions of A. F. Mishin compel releasing of some of this material. I will not at present go into it in great detail.

I will attract attention here only to the gross error, completely inadmissible. Here is what he says: "according to our observations, they, that is, the 8 incisors of the reindeer (with which it is born) seem to be permanent and possess the ability for natural growth and development." It is to be supposed that the period of replacement of the so-called milk incisors by permanent ones is absent.

All this is certainly incorrect. Thus, it is not at all to be supposed as Mishin imagines it. The teeth of mammals are as a rule diphyodont. That is, they have two generations, deciduous and permanent. Three permanent molars grow in directly on each side. All the remaining teeth: incisors, canines and premolars, are replaced. First occur the deciduous teeth, later they are replaced by the permanent. This is the situation in the majority of mammals and in all the living order of ruminants without exception. Among the mammals exceptions to the rule are encountered only as follows:

- 1) species of whales, 2) in marsupials, 3) pi 4) insectivores, and
- 5) in rodents.

In Monophyodonts, that is animals that have only the permanent dentition, such takes place either by atrophy of the milk dentition in embryonic life, or by means of replacement of such before birth, as for example the guinea pig where the milk teeth are replaced before birth.

In all ruminants the replacement of milk teeth occurs after birth and reindeer present no exception to this rule. If Mishin noted no replacement and according to his opinion the teeth seem to be permanent in reindeer this demonstrates only the deficiency of his observation! As regard the

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The first part of the report is a general overview of the project. It describes the objectives, the scope of the work, and the organization of the report. The second part is a detailed description of the methodology used in the study. This includes a discussion of the data collection methods, the statistical analysis techniques, and the software used for data processing.

The third part of the report presents the results of the study. This section is divided into several sub-sections, each corresponding to a different aspect of the research. The first sub-section discusses the overall findings, while the subsequent sub-sections provide a more detailed analysis of specific results. The final part of the report is a conclusion and a list of references. The conclusion summarizes the main findings and discusses their implications. The references list the sources of information used in the study.

The overall structure of the report is as follows: 1. Introduction, 2. Methodology, 3. Results, 4. Conclusion, 5. References. The report is written in a clear and concise style, using simple language and avoiding unnecessary technical details. The use of headings and sub-headings helps to organize the information and makes it easier to navigate. The report is a valuable resource for anyone interested in the topic of the study.

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reindeer herding natives it is not necessary for them to observe such for they recognize the reindeer by other characteristics fairly accurately for up to a year.

In actual fact the replacement of milk teeth occurs after birth and the actual process of replacement is shown very clearly in the accompanying photographs. The progress of the permanent incisors which push out the deciduous incisors may be noted. This photograph sufficiently refutes the hurried conclusions of A. Mishin. Of the reported species in the deer family the time of replacement is varied but as a rule with all the deer it is the deciduous teeth that appear first (after birth). Then subsequently the milk teeth drop out and are replaced by the permanent ones. This is the rule without exception. The deer belong to the order Artiodactyla and the sub-order of Ruminants and like all ruminants change their teeth. But the teeth of these deer differ in one way from other ruminants. A characteristic feature is the occurrence of upper canines whereas livestock, sheep and goats do not have upper canines. Upper canines occur in the greater part of deer species that have been described, and in the males of some species they attain great development. With such it may be noted that the smaller the antlers the larger the canines. For example, in the Muntjac, the antlers are not large but the canines are visible. In musk deer they do not have antlers at all and the canines are strongly developed and curled. The dental formula in the deer family is thus:

Deciduous: 0/4, 0/0, 3/3 ---
Permanent: 0/4, 1/0, 1/1, 6/6

In the reindeer the canines do not protrude through the membrane of the upper gums but on the skull they are seen clearly and quite recognizable.

All have 8 incisors distributed in an arch on the lower jaw. It may be seen that there are, as in cattle, a first, second, third and fourth incisor*. The incisors of deer are not firmly embedded in the alveoli but are loosely moveable. This mobility makes it so that the unprotected membrane of the upper jaw is not wounded by the incisors. When the lower jaw of the reindeer is boiled the incisors easily fall out. In each incisor is easily distinguished a root, crown and neck. The crown of the first incisor is triangular but more elongated in the other three. The labial surface is a smoothly convex curved surface.

In the 3 1/2 month old fawn all the incisors are still deciduous. Replacement begins probably after six months and by 10 months all the milk incisors are replaced by permanent ones. Colntsyia did not know of this and Mishin disregards it and plainly repeats the incorrect advice of Colntsyia. There is no doubt that reindeer are no different with respect to the replacement of milk teeth, and cannot be distinguished in this respect from other ruminants and the majority of mammals. It would have been better only to be observant and not rush to conclusions with little experience and a limited collection. The sharp distinction between the milk incisors and the permanent ones may be seen

in the accompanying photograph. Replacement by the cutting through and gradually pushing aside of the milk teeth by the permanent is clearly seen in the available preparation, a photograph of which is enclosed. The results of my observations are strengthened by the assembled collection and likewise confirmed by the observations of the American veterinarian Hadwen in Alaska. In his report, written together with Palmer, one can read on p.4 the following:

"At birth the calves have 8 deciduous incisors, 12 molars and 4 more cutting through the gums. At 10-12 months the deciduous incisors all drop out and the permanent ones are substituted. The deciduous (temporary) incisors are smaller, thinner and more flat and narrow than the permanent ones. At the end of the first year 4 more molars come in, thus bringing the total to 20 in the jaws. In the second year appear 4 more molars so that altogether by the third summer the reindeer has 8 permanent incisors and 24 molars, totalling 32. In the second summer wear on "i1" begins and by the third summer all the incisors are being worn. By the fourth year they begin to separate away from one another. Wear continues till the 15th year. By the fifteenth year the incisors are worn down to little stumps and completely separated from one another."

There is no doubt that the milk incisors have been replaced by the time the reindeer is one year old, and after another year have been evened off. Full replacement of the incisors in the yearling, as a matter of fact, indicates the precociousness of the reindeer compared to other ruminants and to horses.

<u>Number of dec. incisors at birth</u>	<u>Appearance of all Dec. incisors</u>	<u>Complete replacement by perm. ones</u>
Camels 0	10 mos.	6 yrs.
horse 0	10 mos.	5 yrs.
cattle 0	15 days	4 1/2 yrs.**
sheep and goats 0	25 days	3 1/2 yrs.
Red deer 8	--	2 yrs.
reindeer 8	--	1 yr.

**Sooner in the precocious breeds.

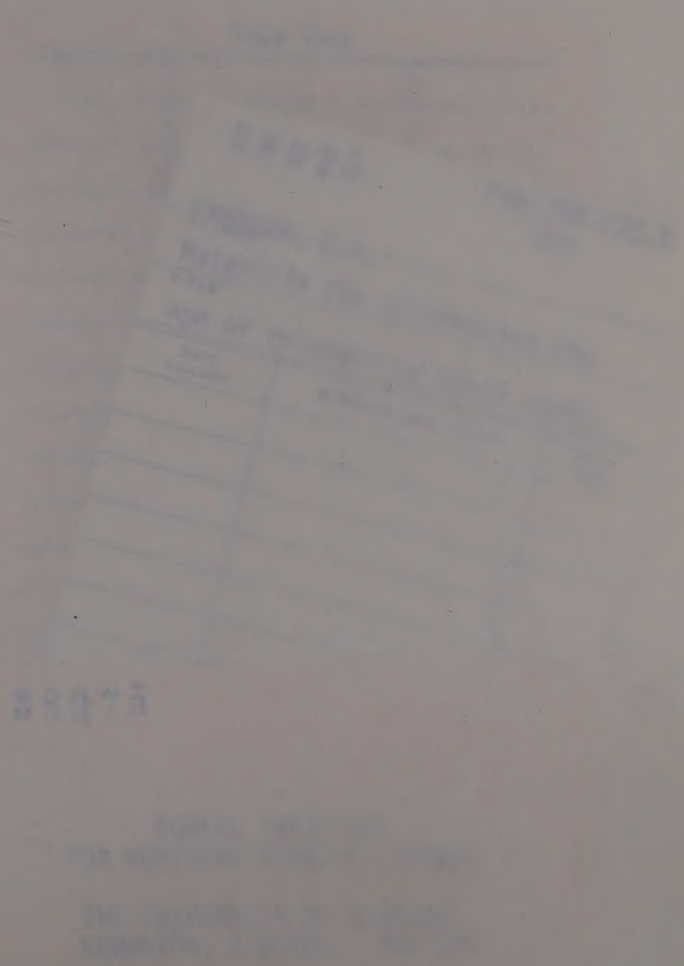
The precociousness of the reindeer as compared with other ruminants and with other species of the deer family may be seen. This precociousness should be brought to the attention of zoological technicians who hastily determined the time of significant initial calving. Generally, in herds, significant fertilization occurs when the females are 1 year, 5 months old and which initially calve when they are exactly at their second year. To separate them artificially at this time is not necessary. There is no danger in such early first births. On the contrary, it is owing to this precociousness that a herd of reindeer may be doubled in a short time.

In view of the accepted idea that already in the jaws of a yearling reindeer there has occurred complete replacement of the deciduous teeth by the permanent ones, then the idea of their precociousness and the importance of initial births in the second summer will also be comprehensible.

* (translators note)

first incisor = zatsep, second incisor = srednee vnutri

third incisor - srednee vneshnii, fourth incisor = okpaika



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AUTHOR

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