BRIEF COMMUNICATION

THE TIME OF FOALING OF THOROUGHBRED MARES

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The length of pregnancy in the mare is known to be influenced both by the genotype of the foetus and the environment of the mother. The heritability of gestation length is 36% (Rollins & Howell, 1951), and male foetuses are carried longer than females (Uppenborn, 1933; Mauch, 1937). Mares mated between December and May have pregnancies that are on average 10 days longer than those of mares mated at other times of the year. This seasonal influence alone accounts for 44% of the observed variance in gestation length, and it appears to be independent of nutritional factors (Howell & Rollins, 1951).

In addition to these genetical and environmental factors that control the day of parturition, there appear to be other environmental factors that can even influence the hour of birth.

The time of rupture of the chorio-allantoic membrane was recorded in 501 thoroughbred mares foaling at three public studs in the Newmarket area during 1960–66. All the foalings occurred during the months of January to June, and the mares were all kept under similar conditions of management. The hourly incidence of foalings and the stud routine are shown in Text-fig. 1. It is obvious that the great majority of foalings take place at night; 86% occur between 19.00 and 07.00 hours. The maximal incidence is between 22.00 and 23.00 hours, and the distribution about this maximum is markedly skewed.

These results are almost identical to those obtained in Poland (Zwolinski & Siudinski, 1965), and to the limited observations made in Sweden (Bane, 1961). Zwolinski & Siudinski (1965) also observed that as the nights became shorter in the summer, the frequency of foalings per hour of darkness actually increased. This, together with the fact that semi-wild mares in the New Forest also seem to foal at night (Davenport, personal communication), suggests that light is the controlling environmental factor.

However, husbandry factors may also be important. At the University of Bristol Veterinary Field Station, students were in close attendance on thirteen mares immediately prior to foaling. Under these conditions, the circadian rhythm was abolished, and more mares foaled by day than by night (seven between 07.00 and 19.00 hours; Messervy, personal communication).

The mechanisms whereby these genetical and environmental factors are able

to control the time of parturition cannot be understood until we know what initiates normal labour. It is interesting that a similar, though much less pronounced, circadian rhythm in the time of birth is well recognized in women (Malek, Gleich & Mály, 1962; Kaiser & Halberg, 1962) and pigs (Deakin & Fraser, 1935). It is also seen in mice, where the rhythm can be reversed by reversing the periods of light and darkness (Merton, 1937; Svorad & Šáchová, 1959), and in the Chinese hamster (Yerganian, 1958). However, in cows there seems to be little variation in the frequency of parturition throughout the 24 hr (Richter, 1933), and in sheep and golden hamsters births are commonest during the daylight hours (Lindahl, 1964; Rowell, 1959).

TEXT-FIG. 1. Time of foaling of throughbred mares.

For animals that do not give birth to their young in a nest, one would imagine that the process of parturition must have been subjected to a particularly heavy selection pressure. Thus any circadian rhythm is likely to have been of some adaptive significance. Whilst births at night offer the greatest chance of concealment from predators, this may be largely offset by the fact that night is the time of greatest predator activity. It would be interesting to know what factors led the horse to develop such an efficient mechanism for concentrating births into the hours of darkness.

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