color blind, and considerably less than even that they would both be normal.

As to the conditions of the subject's grandparents (I 1 and 2, 3 and 4), which are not stated, it is possible only to conjecture, though it is apparent that both the grandmothers must have been either color blind or heterozygous for the defect. The grandfathers might have been color blind or not as far as the data go. Nothing further can be said about the paternal grandparents, but the subject's mother having had normal vision it is possible to say that if his maternal grandmother (I 4) was color blind her husband must have had normal vision, whereas if she had nor-

mal vision he must have been color blind. That is, to give the results obtained (heterozygous normal daughter and color blind son) the mating must have been $N- \times n$ or $n- \times Nn$.

It would have been interesting if he had noted the condition of his brother-in-law (III 1), that is, the husband of his color-blind sister (III 2). It was a foregone conclusion that all her sons would have defective vision since she herself was color blind, but any daughters would have served as an index to the father's condition, since their vision would have corresponded to his. As it is, he may or may not have been color blind.

THE GESTATION OF THE CARABAO

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LITTLE is known about the breeding habits of the carabao (*Bos bubalus*), since these animals are on the range most of the time. They rarely go under shelter except during the busy season of harvesting, when they are tied close to the house of the farmer, under a light bamboo and cogon or nipa shed, and are fed on sugar-cane leaves or rice straw. While the crops are growing, the carabaos are used in cultivating the crops, and are grazed on vacant lots, on paths overgrown with grass, or on the roadside. At these times breeding is not likely to occur, as these animals are herded more or less individually by the children of the farmers.

After harvest, all the carabaos in the neighborhood have the run of all the fields in common, since fenced areas are rather rare in the Philippines, and it may be presumed that it is at this period when breeding occurs. Carabaos mature later than cattle, bulls hardly breeding regularly before three years of age, and cows usually bringing their first

young at five, sometimes at four, but rarely before that. Under such conditions it is impossible to determine the exact gestation of the carabao, and an inquiry among the farmers elicits a variety of answers ranging from nine to thirteen months or more.

With the acquisition of a small herd of these animals by the College of Agriculture, the cows were kept separate from the bull from the start, and observations were made on their estrum. The period of estrum of these animals is very obscure, and the only way we succeeded in breeding them was by attempted matings of them at frequent intervals.

The figures obtained so far, while few, are significant, inasmuch as they are fairly uniform. Due to the reasons mentioned above, observations on the period of gestation of this animal will probably never become numerous. At the College we estimate that we lost about half a year on an average for each cow observed by not knowing the exact time when each cow should be bred, due to the obscurity of estrum.

CARABAO COW WITH THREE DAYS OLD CALF. (Fig. 13.)

The Philippine carabao is essentially the same as the buffalo or water buffalo of India, China, Java, and other oriental countries, except for slight variety differences as to size and shape of horn, color and texture of skin, and slight differences in conformation. The writer examined the literature from the

above countries but has not come across any observations pertaining to this question.

The animals observed so far are as follows:

The gestation of the carabao, therefore, is approximately 320 days, or forty days more than the cow (280),

Animal.	Date bred.	Date calved.	Sex of calf.	Period of gestation
Cow No. 1.....	June 24, 1918.....	May 14, 1919....	Female.....	324 days.
Cow No. 2.....	Jan. 5, 1918.....	Nov. 19, 1918....	Female.....	318 days.
Cow No. 4.....	Jan. 6, 8, 10, 1918...	Nov. 30, 1918....	Male.....	324-328 days.

and twenty days less than the mare (340).

Observations were also made on the period of estrum immediately following parturition, and this gave us:

This period was determined by trying, every two days after calving, to mate the animals. These latter figures are simply offered as observations and may not hold true in every instance.

Animal	Date of calving	Date of first estrum	Lapse of time after calving
Cow No. 2.....	November 19, 1918....	Jan. 12, 1919.....	54 days
Cow No. 4.....	November 30, 1918....	Jan. 23, 1919.....	54 days