the tubes in a bowl of ice. We have found that the sample can be stored in this way for some time before use without prejudicing the tissue culture part of the experiment.

An example of the results obtained by this method is shown in Fig. 1, demonstrating the chromosomes of a cow of the Santa Gertrudis breed.

This method has also been successfully applied to blood samples from the dog, the horse, and from man; but it would appear that there is no advantage over simpler methods used in these species. Although the separation of the white cells from the erythrocytes is not complete, it should be appreciated that it is not necessary to remove all red blood cells from the sample in order to obtain successful tissue culture. Therefore, the insistence on an exact technique for preparation of pure white cell suspensions is superfluous. Another advantage of the method is that satisfactory suspensions of white cells in terms of number can be prepared from fairly small blood samples, for example, 2 ml. This is considerably less than the amount of blood usually drawn in standard work with human beings. Although this point is unimportant for the larger animals, it is very important when dealing with animals such as the cat, where the routine sample of 10 c.c. would be quite impossible to obtain.

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Preparation of Bovine Chromosomes

Certain problems have induced us to prepare the chromosomes of bovine leucocytes. Using the methods of other authors[1–3] the following technique was adopted:

20·0–40·0 ml. blood were collected from the jugular vein of an ox, to which was added 2·0–4·0 ml. heparin solution (200 mg heparin, 100 mg streptomycin, 10,000 units penicillin, 100·0 ml. of a 0·85 per cent saline solution) or an appropriate amount of 'Vetren' or 'Thrombovetren' (Promonta, Hamburg). This was put in a vessel containing 0·12–0·24 ml. phytohæmagglutinin *P* or 0·4–0·8 ml. phytohæmagglutinin *M* (Difco), well mixed, stored for 20 min in a refrigerator, centrifuged afterwards for 10 min at about 900*g* and the leucocyte-layer obtained. (Bovine erythrocytes were not agglutinated by phytohæmagglutinin.)

A leucocyte-suspension of 1,000–1,200 cells/mm^3 was prepared in 20 per cent homologous plasma and 80 per cent '*TC* medium' 199 (Difco). 10·0 ml. of the suspension were filled in each of 3 culture vessels and incubated at 37° C. 48–72 h later 1·0 ml. of a 0·04 per cent colcemid solution was added to the culture with the highest colour deviation towards yellow, kept for another 3 h in the incubator, cells centrifuged off, and put in a 0·95 per cent sodium citrate solution at 37° C and maintained for 20 min at 37° C. After this the cells are again centrifuged off, five times washed with a mixture of 1 part glacial acetic acid and 3 parts absolute alcohol (fixative) and the cells in sufficient density suspended in the fixative. One drop of this was placed on an iced moistened slide, air dried for 30 min, dyed in a 2 per cent orcein-solution and solidly covered.

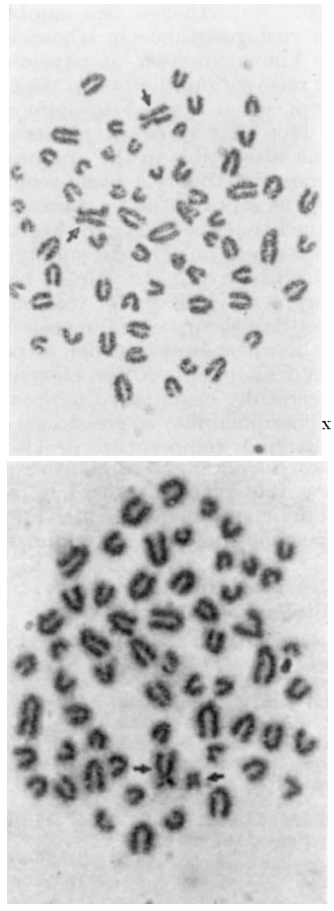

Fig. 2. Chromosomes of a male ox

Leucocytes of 4 males and 7 females were examined and 20 complete mitoses were counted of each animal. Figs. 1 and 2 show the normal diploid chromosomal rate in bovine leucocytes. Accordingly the ox cell has 60 chromosomes, 58 of which are acrocentric and obviously differ only by length of chromomeres, while 2 chromosomes are metacentric. The sex-chromosomes are marked by arrows.

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GENETICS

Genetic Basis of Stem Rust Resistance in Wheat

Present-day theory postulates a gene-for-gene basis for the host–parasite relationship between *Triticum aestivum* and *Puccinia graminis tritici* Eriks. and Henn. This emanates from the work of Flor[1] on flax rust as corroborated by Person[2] for stem rust in wheat.

In its ultimate extension this theory demands as many genes for rust resistance in the wheat plant as there are genes for pathogenicity in the rust fungus. However, some genes in wheat mediate resistance to a spectrum of