Fig. 2. Comparison between transferrin patterns in bison and in cattle

There are several explanations why we failed to detect polymorphism in bison transferrins and haemoglobins. One is that the sample was too small and was not representative of all American buffalo. Another is that genetic variation in these traits was lost during the drastic reduction of the bison populations in the nineteenth century. For example, Owen *et al.*⁸ proposed such an explanation in their discussion of the reasons for the small amount of variation in bison blood groups as detected in tests with cattle blood-typing reagents. But the possibility that bison evolved with little or no genetic variation in such traits cannot be excluded. Perhaps under natural selection mutants at the loci controlling blood groups, transferrins and haemoglobins are not permitted to accumulate as rapidly as they do under artificial selection.

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Qualitative Differences in the Mechanism of Complement Fixation

THE sensitization of human red cells by complement-fixing antibodies can be demonstrated with specific anti-human complement serum. By immunizing rabbits with egg albumen/anti-egg albumen precipitate with bound human C' , an anti-complement serum was obtained, which contains at least two antibodies against human complement components, that is, C'_{3a} and C'_4 (ref. 1).

When tested in immuno-electrophoresis this antiserum forms two precipitation lines with human serum, called $\beta_1-C(C'_{3a})$ and $\beta_1-E(C'_4)$ (ref. 2).

Anti-complement serum reacts, for example, with sensitized Lewis cells, red cells sensitized with naturally

	Anti- C'	Anti- C' $\times$ HA-c.a.*	Anti- C' $\times$ E-c.a.†	Anti- C' $\times$ E-L.a.‡
HA-c.a.*	+	—	—	—
E-c.a.†	+	+	—	—
E-L.a.‡	+	+	+	—

* *In vivo* sensitized red cells obtained from patients with cold-type haemolytic anaemia.
† Erythrocytes sensitized with naturally occurring incomplete cold antibodies.
‡ Sensitized Lewis red cells, which behave as sensitized sheep cells (EA) with bound $C'_{1,4,2,3a}$.

occurring incomplete cold antibodies, and red cells obtained from patients with cold type haemolytic anaemia. We performed cross-absorptions of the anti-complement serum with these different types of sensitized cells.

The results of the cross-absorption procedures are given in Table 1.

Fig. 1 shows the immuno-electrophoretic pattern obtained by the reaction between human serum and the non-absorbed and absorbed anti-complement serum. Sensitized Lewis cells remove both anti- C'_{3a} and anti- C'_4 antibodies; after absorption with red cells sensitized with naturally occurring incomplete cold antibodies anti- C'_4 is exhausted only, whereas the sensitized HA-c.a. cells absorb neither anti- C'_4 nor anti- C'_{3a} . The results of the immuno-electrophoretic investigation perfectly correlate with those obtained in the serological cross-absorption experiments. One outstanding feature is that C'_{3a} appears not to be bound to those systems which usually do not show haemolysis.

Fig. 1. Immuno-electrophoretic pattern obtained with non-absorbed and absorbed anti- C' serum

We have excluded the possibility that the agglutination of the HA-c.a. cells by the anti- C' serum was due to anti- β_2 -M (19S γ -globulin) antibodies. However, several rabbit sera, even those of some non-immunized animals, possess the ability to agglutinate these HA-c.a. cells, sometimes in titres up to 32. This type of reaction, which is not caused by heterophile red cell antibodies, is under investigation.

Further experiments are needed to establish whether the reaction of anti- C' serum with HA-c.a. cells described here occurs on account of possibly present anti- C'_1 , or is due to the as yet unexplained agglutinating-ability of certain rabbit sera.

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