and 3 *Cebus nigrivittatus*). All the monkeys were found to have type *Hp* 1–1. The authors suggested that this might be a phylogenetically significant finding, should future investigations confirm that monkeys have only one type of haptoglobin.

The slow-migrating zones of our three heterozygotes were very weak. Such weak types may be overlooked and classified as *Hp* 1–1, especially as the fastest zone is very strong.

The findings by Arends and Rodriguez[4] and our distribution (seven *Hp* 1–1 and three *Hp* 2–1) indicate that the frequency of the *Hp*–1 gene may be high in monkeys. It is then quite reasonable that no *Hp* 2–2 type has yet emerged.

It is known also that African Negroes have a high frequency of the *Hp*–1 gene (refs. 3, 5). Hence this gene might have a selective advantage in tropical areas.

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A Re-Evaluation of the Clotting Time of Chicken Blood

The blood coagulation mechanism of the chicken appears to differ greatly from that of mammals, in that its clotting time can exceed 1 hr. Recent literature assumes the chicken to have a blood-clotting time in a range similar to the higher mammals. Dukes[1] quotes Amendt (1922) as finding this to be 4·5 min.; Johnson and Connor[2] found an average of 6 min. 21 sec. with a range of 1–14 min.; while Didisheim *et al.*[3] query their recorded time of 9 min. in glass and 10 min. with siliconized equipment at 37° C. Howell[4], however, in 1909 infers that it is common knowledge that the blood of birds, terrapins and horses clots slowly. In 1940[5] he indicates that prolonged clotting time of hours or days in lower vertebrates (birds, reptiles and fishes) is due to the lack of "thromboplastic substance" within the vessels while prompt clotting is brought about by an active "thromboplastic tissue extract".

In a preliminary determination of clotting times on fifteen chickens using the Lee and White method[6] with plastic or siliconized glass syringes, a range of 1·5–30·0 min. was found at 42° C. It was observed that the negative pressure of the syringe caused a 'fluttering' of the fragile vein against the bevel of the needle and that the greater the degree of 'fluttering', the shorter was the clotting time of the blood. It was assumed from this that the trauma caused by the vein striking the needle released tissue thromboplastin which hastened clotting.

Blood from thirty-seven caged laying hens of three different breeds (Leghorns, Light Sussex and White Rocks) was collected utilizing precautions to minimize the release of tissue thromboplastin. This was done by venipuncture with No. 20 siliconized *B–D* vacutainer needles only. No syringe was used, the blood being allowed to flow directly into 13 mm. × 10 cm. Kimble glass tubes by very slight digital pressure on the superior portion of the brachial vein. Needle movement within the vein was minimized. Clotting times varied from wing to wing, also between the two tubes from each wing; the longest for each bird ranged from 13 to 180 min. with a mean of 69·25 min. (*S.D.* 36·6) (Fig. 1).

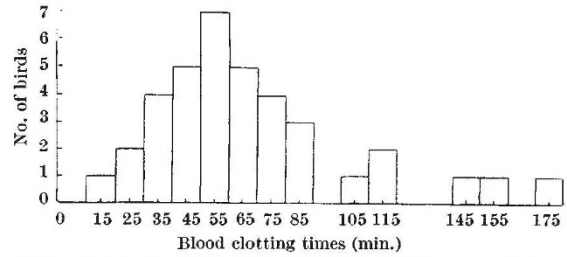

Fig. 1. Distribution of blood clotting times of thirty-seven chickens

Native blood was also timed with a stop watch following the addition of (1) 0·1 ml. of chicken brain thromboplastin prepared by the acetone dehydration method of Quick[7] and (2) 0·1 ml. of chicken thrombin (full strength) made by the technique described by Biggs and Macfarlane[8]. The results are summarized in Table 1.

Table 1. Coagulation Time at 42° C. of Chicken Blood with and without Added Thromboplastin or Thrombin

No. of birds	Material added	Clotting time (sec.)	Control Lee–White clotting time (min.)
21	Chicken thromboplastin	13·4 (11–17·8)	70
15	Chicken thrombin	30·6 (19–50)	64·5

These observations tend to confirm those of Howell[4,5] and indicate: (1) that the blood of the birds tested had generated very little plasma thromboplastin; (2) that the chicken has an efficient blood-clotting mechanism, but that it relies on an active tissue thromboplastin rather than plasma thromboplastin as do mammals; (3) that the shorter clotting times noted here and by other authors may have been due to action by vein wall tissue thromboplastin.

The apparently delayed action of the chicken thrombin in Table 1 is under investigation. A comparison of clotting times at 37° C. and 42° C. revealed only a slightly longer time at 37° C.

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