Table 1

Patient	Transfusion data				Factor VIII activity				Skin bleeding time 10 min after transfusion (min)
	Material	Volume (ml.)	Factor VIII activity (*a*) (ml.)	Duration of transfusion (min)	Before transfusion (%)	Expected activity (*b*) (%)	Observed activity (%)	Time after transfusion (h)	
Von Willebrand's disease (D. W.)	Plasma (*c*)	1,000	1,000	37	14	33	62	4–8	7
	Serum (*d*)	1,100	< 11	65	9	10	82	8	> 20
	Plasma fraction I-0 (*e*)	180	540	15	10	27	42	14	12
Hæmophilia *A* (R. C.)	Plasma fraction I-0 (*f*)	700	1,800	54	< 1	44	35	1	—

(*a*) Expressed as ml. of plasma with 100 per cent normal factor VIII activity. (*b*) Calculated on basis of simple mixing. (*c*) 9 vol. of normal blood added to 1 vol. of a solution containing 0·053 M citric acid and 0·105 M trisodium citrate, plasma obtained by centrifugation and stored at −20° C for 30 days. Thawed and warmed to 37° C immediately before use (Fig. 1, curve ○). (*d*) Blood collected without anticoagulant; kept at room temperature for 24 h, centrifuged, serum collected, stored for 24 h at room temperature and then 24 h at 2° C (curve ●). (*e*) Dry preparation from 1,650 ml. of A.C.D. plasma reconstituted (curve ▲). (*f*) As for (*e*) but from 4,900 ml. of A.C.D. plasma (curve ■).

activity in his plasma and his skin bleeding time is consistently in excess of 20 min, except after blood transfusions. His plasma volume is assumed to be 3 litres. He has been transfused successively with plasma, serum and plasma fraction I–0 (ref. 3). Factor VIII determinations in plasma and skin bleeding time were performed at intervals. The relevant results are shown in Table 1 and Fig. 1 and are compared with that of a patient (R. C.) with severe hæmophilia *A* (less than 1 per cent plasma factor VIII) whose plasma volume is assumed to be 3·5 litres. The results after transfusion observed in R. C. are typical of those seen in hæmophilia *A* in which the half-life of transfused factor VIII is between 5 and 15 h. In the case of D. W. the plasma factor VIII activity rose much higher than expected following transfusion of plasma or serum. In addition the skin bleeding time was shortened after the transfusions of plasma or of the plasma fraction I–0 but the serum transfusion did not shorten the skin bleeding time. Factor VIII activity was assayed by two independent techniques (partial thromboplastin time and thromboplastin generation), using plasma with less than 1 per cent factor VIII from hæmophilia *A* patients. Non-specific effects were excluded. It is believed the results represent true factor VIII-levels.

The observations suggest that normal plasma contains two components which are lacking in patients with von Willebrand's syndrome. The component which stimulates factor VIII activity *in vivo* is present both in citrated plasma (*p*H 7·1) stored at −20° C for 30 days and in serum. Only a low activity is present in lyophilized plasma fraction I–0. The second component which shortens the bleeding time is present in frozen plasma and plasma fraction I–0, but is absent from serum.

Potentiation of factor VIII activity occurs in normal persons and hæmophilic patients with measurable levels of plasma factor VIII immediately after exercise[4] or adrenaline infusion[5], and a rise of factor VIII activity occurs in normal persons 1–3 days after serum infusion[6].

There is no obvious relation between these observations and the reported experiments.

The clinical implications will be reported separately.

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Correlation between Rheumatic Diseases and Rh Blood Groups

We have recently determined the blood groups of 99 patients with some variety of articular disease (31 with rheumatoid arthritis, 31 with rheumatoid spondylitis, 15 with gout, 9 with disseminated lupus erythematosus, 6 with familial Mediterranean fever, and 7 with various other diseases). Statistical analyses demonstrated no significant heterogeneity among the results obtained for the different diseases. Accordingly, the data were pooled. For comparison we used Wiener's series of 1071 New York Whites[1], as in a previous investigation[2]. There is a significant correlation between the absence of the Rh antigen D and rheumatic disease, as shown in Table 1. No correlation was found between the presence of rheumatic disease and antigens C or E, or with the ABO blood group system. There did, however, seem to be a correlation with the absence of antigen N ($\chi^2_{(2)} = 9{\cdot}59$, $P = 8 \times 10^{-3}$).

Table 1

	Rhesus type D+	Rhesus type D−	Total
Articular disease	71	28	99
Normals (New York City)	902	160	1,071

$\chi^2_{(1)} = 10{\cdot}12$, $P = c.\ 1{\cdot}5 \times 10^{-3}$.

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Changes in the Concentration of Potassium in the Erythrocytes and in Hæmoglobin Type in Merino Sheep under a Severe Anæmic Stress

Most breeds of sheep are polymorphic with respect to the concentration of potassium in their erythrocytes (70–90 m.equiv. K^+ (*HK*) or 10–20 m.equiv. K^+ (*LK*) per litre of red cells[1]) and hæmoglobin type (Hb A, B or AB[2]). High concentrations of K^+ (approximately 110 m.equiv./l.), which fall to normal adult levels 60–100 days after birth, are found in the erythrocytes of all fœtal lambs[3]. In the erythrocytes of normal adult sheep the mean concentration of potassium remains relatively