

Shift of Body Fluids in Severe Burns.

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Blalock,¹ Parsons and Phemister,² and others have shown that in traumatic shock and in severe burns there is a marked shift of fluid from the blood into the injured tissues. This fluid shift has been measured in the case of burns by burning one lateral half of the animal and then after midline sagittal section, measuring directly the difference in weight of the 2 halves. The amount of fluid shift has been found sufficient to explain the resultant shock. This method allows only one determination of the amount of shift in each animal. Because of variation in the extent of the burn and in the reaction of individual animals, a complete record of the rate of shift of fluid will not be obtained.

In all experiments completely anesthetized animals who suffered no pain whatsoever were used and no burned animals were allowed to recover.

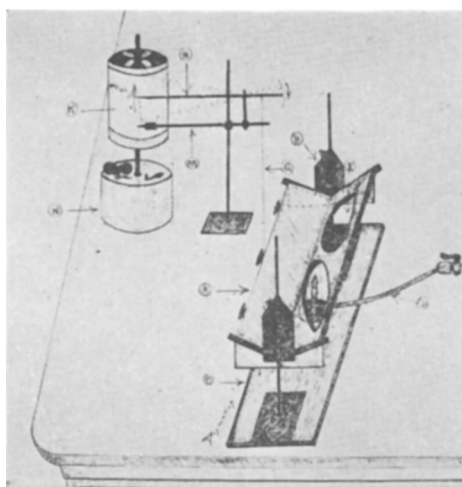


FIG. 1.

A—Trough on which animal is placed, B—steel end plates with holes for knife-edge suspension, C—base, D—tube to bunsen burner, E—hole for burn, G—recording thread, H—marker, K—smoked drum, M—time marker, N—drum stand.

¹ Blalock, A., *Arch. Surg.*, 1931, **22**, 610.

² Parsons, E., and Phemister, D. B., *Surg. Gynec. and Obst.*, 1930, **51**, 196.

The author devised the apparatus shown in Fig. 1. An animal placed on this apparatus is in a state of balance and any lateral shift in fluid will cause a tipping of the apparatus and resultant change in the position of the marker on the kymographic drum. When one-half of the animal is burned, the fluid shift to the burned side results in such a tipping and this in turn is recorded on the drum as a tracing.

Large rabbits or small dogs anesthetized with barbital and ether were used in all experiments. The animal was completely encased in a plaster cast except an opening on one side for the fore leg, axilla and upper chest and another opening for the lower abdomen and hind leg, which were burned. The tracing was continued until death. The animal was then divided into 2 lateral halves and weighed, the head, tail, viscera and spinal column being discarded.

The results in 4 animals burned on the balanced apparatus are given in Table I. It is seen that in general about half of the total

TABLE I.

		Fluid shift in % of total shift										Time of death in hrs.	Total shift in gm.	Total shift as % body wt.	
No.	Animal	Wgt. kilos	10'	20'	30'	45'	60'	2 hrs.	3 hrs.	4 hrs.	5 hrs.				6 hrs.
1	Rabbit	3.3	—	—	—	—	—	—	83	—	100	5½	24	0.7	
2	Dog	5.0	0	25	32	36	41	57	70	81	87	97	6½	170	3.4
3	Dog	4.0	0	17	25	33	42	75	100	—	—	—	3½	89	2.2
4	Dog	5.0	24	—	56	60	64	72	84	88	96	100	5½	130	2.6

shift occurred in the first hour. In the first 2 experiments the total shift was obtained only approximately by placing weights on the apparatus at a distance from the fulcrum corresponding to the center of the burned area until the apparatus was again in balance. The accuracy of this approximation may be gauged from the observation that in the third experiment the approximation gave 55 gm. and the direct weighing 89 gm. shift and in the fourth experiment the two methods gave 145 and 130 gm. respectively.

Control curves obtained by burning dead animals and by burning plaster of Paris showed only a slight shift of weight to the unburned side.