countered. No sera were available for testing from the children from whom the viruses were isolated.

Summary. A viral agent was isolated in primary rhesus monkey kidney cell cultures from rectal swabs obtained from 2 healthy children resident in Western Pennsylvania. Although the agent had many of the characteristics of the human enterovirus group no serological relationship to any of the recognized protypes was demonstrated. Sera drawn from 2 normal adult population groups showed the presence of antibodies in a significant proportion (16-18%) against the virus which was successfully reisolated from the 2 original specimens. The evidence suggests that this as yet unidentified agent is a member of the human enterovirus group.

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Capillaries in Heart and Skeletal Muscle of Dog and Rabbit.* (31866)

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Since Krogh's pioneer work it is believed that the capillary density in small animals is higher than in the larger ones and that this is related to the higher metabolic rate of smaller animals. Krogh(1) found this difference in capillary counts per square mm of cross section in skeletal muscles of the horse, the dog and the guinea pig. Similar results were obtained by Paff in the rat, the guinea pig and the cat(2). Schmidt-Nielsen and Pennycuik(3) studied a large series of mammals and found that capillary density in different skeletal muscles was highest in the two smallest animals (bat and mouse). On the other hand, no definite trend was discernible in other animals examined. They called attention to many other factors influencing capillary density such as activity of the animal, acclimatization and size of the muscle fibers. Similar studies on the heart muscle are lacking.

In the experiments reported here we compared capillary density of heart and skeletal muscle in two animals of different size and physical activity: the dog and the domestic rabbit.

Methods. The capacity of the terminal vascular bed in per cent of tissue volume was used as an indicator of the capillary density (4). The procedure, identical for both species, was as follows: the animals were anesthetized with diabutal (sodium pentobarbital), artificially ventilated and the heart was exposed *via* left thoracotomy. Albumin I131

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TABLE I. Capacity of Terminal Vascular Bed in Per Cent of Tissue Volume.

No.	Heart muscle		Skeletal muscle	
	Apex	Septum	Gastroc-nemius	Vastus lateralis
		Rabbit		
1	9.05	7.58	0.90	—
2	11.01	8.84	0.67	0.52
3	7.63	6.64	0.53	0.39
4	10.12	7.98	0.61	0.34
5	9.21	7.23	0.55	0.33
6	9.03	7.54	0.94	0.61
7	8.05	6.01	0.57	0.39
8	7.39	7.43	0.65	0.42
9	8.60	6.67	0.84	0.43
10	8.34	7.26	0.59	0.17
11	9.15	—	0.57	0.39
12	8.16	6.69	0.76	—
13	9.83	6.56	0.20	0.26
Mean	8.89	7.20	0.64	0.39
SE*	±0.28	±0.23	±0.05	±0.04
		Dog		
1	—	3.40	1.16	1.01
2	4.62	4.26	1.53	1.10
3	6.68	5.58	1.06	1.09
4	—	3.41	1.29	1.09
5	5.44	4.76	1.53	1.17
6	10.35	5.42	1.21	0.96
7	4.31	4.03	1.43	—
8	5.13	4.65	1.11	—
Mean	5.98	4.43	1.29	1.07
SE*	±0.91	±0.29	±0.14	±0.07
"t" test	$p<0.001$	$p<0.001$	$p<0.001$	$p<0.001$

* SE = Standard error of the mean.

(Albumotope, Squibb) was injected intravenously (5 μc/kg). After 90 seconds of equilibration 2 × 1 ml blood were withdrawn from the left ventricular cavity and the heart was stopped in maximal diastole by intracardial injection of KCl solution. The heart was then quickly removed, frozen in liquid nitrogen and several samples were taken from the apex and the septum. In a similar manner, samples were taken from gastrocnemius and vastus muscles. Surface blood together with a thin layer of tissue and all visible vessels were removed from the specimens. The samples were weighed, placed in counting tubes with 2 ml 2 N KOH, and allowed to digest overnight. They were counted in a Packard counter 3 times for 3 minutes the following day. Accuracy of counting: standard error was less than 2 per cent. From the activity of the blood and tissue samples the capacity of the terminal vascular bed was calculated and expressed in per cent of the tissue volume.

Results. As seen in Table I and Figure 1, the capacity of the terminal vascular bed in heart muscle was found to be higher in rabbits than in dogs. In skeletal muscle, on the other hand, in dogs a significantly greater capacity of the terminal vascular bed could be demonstrated than in rabbits. It should also be noted, that in both groups of animals the capacity of the terminal vascular bed is significantly higher in the apex than in the septum and higher in the gastrocnemius than in the vastus lateralis muscles.

Discussion. Stopping the heart in maximal diastole by means of KCl excludes a possible effect of anesthetics. In another study to be reported later, we found that vascular capacity is not influenced by vasopressin and nicotine unless the systolic blood pressure exceeds 300 mm Hg. For the same reason, the accumulation of metabolites such as lactic acid could not alter the vascular capacity. Therefore, capacity of the terminal vascular bed determined under these experimental conditions reflects only anatomical situations and its changes. KCl causes maximal dilatation and, consequently, vascular capacity is definitely not influenced by transitory changes in vascular tone.

The data demonstrates the significance of two factors influencing capillary growth: physical activity and metabolic rate.

Our results confirm the findings of Schmidt-Nielsen and Pennycuik that the capillary

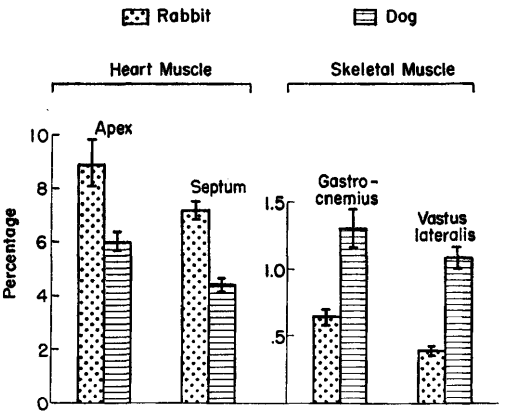

Fig. 1. Capacity of the terminal vascular bed in per cent of tissue volume. Mean values ± standard error of the mean.

density in skeletal muscle of the dog is higher than in skeletal muscle of the rabbit. This difference could be explained by the greater physical activity of the dog. The influence of physical activity on capillary density was shown by Petren *et al*(5) in skeletal and heart muscle in trained and untrained guinea pigs. Also Wachtlová *et al*(6) found a significant higher capillary density in the myocardium of hares than in the myocardium of rabbits of the same age and body weight. This suggests that capillary density of muscles is influenced by the work load imposed on the heart by physical activity.

The myocardium of the domestic rabbit shows a significantly higher capillary density than the myocardium of the dog, despite the greater physical activity of the dog, which is reflected in the higher capillary density in skeletal muscles. This demonstrates that in heart muscle the higher metabolic rate in smaller animals has probably a greater influence on capillary growth than physical activity. In skeletal muscle, however, the effect of physical activity seems to be more important than the effect of the metabolic rate.

Regional differences of capillary density in the heart and differences between gastrocnemius and vastus muscles remain the same despite the variations in the absolute values.

Further investigations regarding the significance of other factors influencing capillary growth are required.

Summary. The capacity of the terminal vascular bed as an indicator of the capillary density in heart and skeletal muscles of the rabbit and the dog was investigated. Tissue samples were taken from two regions of the heart muscle (apex and septum) and from two different skeletal muscles (gastrocnemius and vastus lateralis). The capillary density in heart muscle was higher in the rabbit than in the dog. On the other hand, the capillary density of skeletal muscle was greater in the dog. All differences were statistically significant ($p<0.001$). Factors influencing capillary growth are discussed.

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Effect of Hemorrhage on Hepatic Potassium Movements.* (31867)

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Early experimental studies reported potassium shifts from intracellular fluid to extracellular fluid resulting from hemorrhage and trauma(1-4). In the late stages of clinical shock, potassium shifts were suggested by increased serum potassium concentrations. However, evaluation of the significance of increased potassium levels has varied widely. According to one viewpoint, increased K may be a cause of irreversibility in shock; at the other extreme, it has been regarded as a terminal phenomenon without particular importance.

Increased potassium levels associated with increased rates of potassium release from the liver were observed in unanesthetized dogs during gradual prolonged hemorrhage(5). The possibility exists that potassium shifts may occur early after onset of hemorrhage

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