The vasodilator effect was studied in the web of medium-sized frogs (*Rana pipiens*). Frogs were pithed and the circulation in the web was observed with a low-power microscope. In the control studies of ten frogs, the diameter of the capillaries was 12–15 microns. The amount of epinephrine injected sufficient to bring the circulation in the web to a standstill was determined by injecting increasing doses beginning with 10 gamma of stock solution (1 : 100,000). 1 ml. of toadfish kidney extract prepared as indicated above was then injected into the lateral lymph sac, and the effect on the capillary vessels, a-v anastomoses, arterioles and venules observed. After the effect was fully established, amounts of epinephrine equal to that required to arrest the circulation were then injected, as well as multiple dosages (2–10 times the amount). In the ten frogs thus studied, all showed a definite increase in the diameter of the capillaries to 20–30 microns following the injection of toadfish kidney extract. In nine out of ten frogs there was complete protection against subsequent administration of epinephrine in doses varying from 100 to 500 gamma (1 : 10,000–1 : 2,000).

Similar results have been reported with an extract obtained from mammalian kidneys, named 'tubulin'[3].

Extracts of toadfish liver similarly prepared failed to produce vasodilation or neutralize or protect against epinephrine in similar dilutions.

A more extensive report of these studies will be published in the near future.

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Quantitative Relation Between Salt Accumulation and Salt Respiration in Plant Cells

LUNDEGÅRDH[1,2] has shown how the salt or anion respiration could provide a mechanism of accumulation by transporting anions into the cell. This hypothesis postulates a mechanism whereby anions are transported by an electron carrier (probably cytochrome) in the direction opposite to electrons, and whereby cations exchange for hydrogen ions; both electrons and hydrogen ions enter into the formation of water in the respiratory process. Both ions of a salt are accumulated.

If the Lundegårdh hypothesis is valid, the maximum rate of accumulation should occur when each electron leaving via the oxidase system is exchanged with an anion from the external solution. In this respiration all the molecular oxygen concerned in the process is combined to form water, and each molecule of oxygen therefore requires four electrons and four hydrogen ions. The maximum rate of salt accumulation should therefore be 4 gm. mol. monovalent salt accumulated per gm. mol. oxygen utilized, or,

$$\frac{\text{salt accumulation}}{\text{salt respiration}} = 4.$$

This quantitative relationship is not shown in Lundegårdh's results[3]; but experiments with carrot tissue indicate that, under appropriate conditions, the ratio approaches the theoretical value.

In all experiments, the salt respiration-rate has been taken as the difference between the rate in water and rate in salt solution, which, in well-washed carrot tissue, is equivalent to the cyanide-sensitive respiration[4]. The rate of accumulation, taken over the few hours immediately after the initial equilibration[5], is at its maximum. The results of experiments with various batches of carrots are given in the accompanying table.

Concentration of potassium chloride	No. of observations	Mean of ratio Accumulation-rate / Respiration-rate
0·00063 *M.*	2	0·44 ± 0·16
0·00125	2	1·60 ± 0·73
0·0025	1	2·09
0·005	6	2·26 ± 0·41
0·01	19	2·88 ± 0·84
0·02	16	2·78 ± 0·62
0·03	4	3·00 ± 0·23
0·04	6	3·17 ± 0·79
0·05	8	3·39 ± 0·70
0·06	4	3·38 ± 0·37

At the higher concentrations the ratios approach the hypothetical value. Both salt accumulation and salt respiration-rates increase asymptotically with increasing concentration, but the salt respiration-rate approximates to the asymptote at lower concentrations than does the salt accumulation-rate. This accounts for the significantly lower ratios observed at low concentrations. Results of the same order of magnitude have been obtained with other halides on carrot tissue, and with beet tissue[6] and barley roots[7].

Comparison of these with other relevant data in the literature indicates that: (1) low concentrations give low ratios; this probably accounts for the low ratios calculated from Lundegårdh's results with low concentrations of salt on wheat roots; (2) at higher concentrations when neither accumulation nor salt respiration is limited, the ratio approaches that required by the theory of ion transport by an electron carrier.

This work will be published in full elsewhere. We wish to express our thanks to Prof. J. S. Turner and Dr. J. R. Vickery.

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Aggression, a Component of Post-Epileptic Automatism in *Peromyscus*

CONVULSIVE seizures of rodents have been described in rats[1–4] and in *Peromyscus*[5]. Although various types of convulsive seizures exist, the epileptic form is common to all the strains of animals in which a seizure can be precipitated by specific sounds (audiogenic), and is also induced by other methods. This type has the following general form: a period of

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