Substituting in equation (2),

$$dW/dt = CR_oRT\ln(C_p/C). \quad (6)$$

Applying equations (3), (4) and (6) to experiment 2 of Ingraham, Peters and Visscher,[2] we obtain Fig. 1, which illustrates in a general way the osmotic work

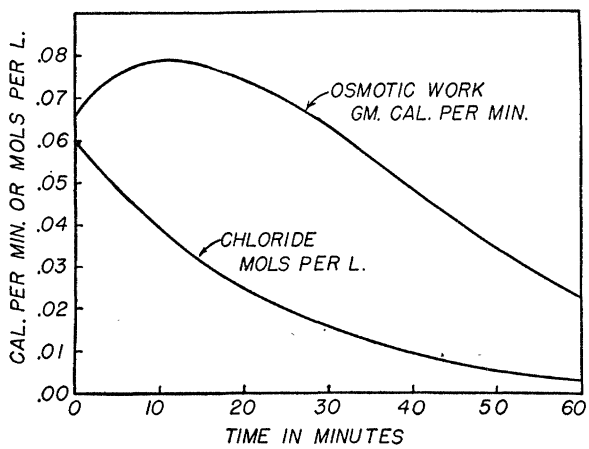

FIG. 1. Rate of performance of osmotic work on the chloride ion and chloride concentration during active absorption.

and concentration curves obtained in this type of experiment.

Differentiating equation (6) with respect to C and equating to 0, we find that dW/dt reaches a maximum when $C = 0.367\ C_p$. Since, in the dog, C_p is generally close to 0.100, we can substitute $C_p = 0.100$ and $C = 0.0367$ in equation (6) and obtain as an approximate equation for the maximum rate of osmotic work during an experiment,

$$(dW/dt)_{max.} = .023R_o, \quad (7)$$

where R_o is in cc per min. and $(dW/dt)_{max.}$ in cal. per min.

Values of $(dW/dt)_{max.}$, calculated from the available data and expressed as cal. per min. per cm of intestine, are given in Table I. Since $(dW/dt)_{max.}$ is the maximum value of the minimum power requirement, its calculation may be of value in finding the mechanism of active chloride absorption. Any proposed mechanism must furnish, at a suitable time during the course of an average experiment of the type considered here, at least 0.0013 gram cal. per min. per cm of intestine before it can reasonably be regarded as a possible sole source of the necessary energy.

TABLE I

MAXIMUM RATE OF OSMOTIC WORK ON THE CHLORIDE ION DURING ACTIVE ABSORPTION

Experimental data	Type of exp.	$(dW/dt)_{max.}$ cal. per min. per cm
Ingraham et al.[2] 3 exps., 3 dogs	Acute	0.0009, 0.0013,* 0.0016 Average, 0.0013
Peters and Visscher[1] 9 exps., 9 dogs	Acute	0.0007, 0.0010, 0.0011, 0.0012, 0.0012, 0.0015, 0.0018, 0.0019, 0.0020 Average, 0.0014
Dennis and Visscher[3] 6 exps., 2 dogs	Chronic loop	0.0013, from average curve, Figs. 1a and 1b

* Exp. 2, described more completely in Fig. 1.

[2] R. C. Ingraham, H. C. Peters and M. B. Visscher, *Jour. Phys. Chem.*, 42: 141, 1938.

[3] C. Dennis and M. B. Visscher, *Am. Jour. Physiol.*, 131: 402, 1940.

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THE MOUSE ANTIALOPECIA FACTOR

WOOLLEY[1] described a syndrome produced in mice on a synthetic diet containing thiamine, riboflavine, nicotinic acid, pyridoxin, β-alanine, pantothenic acid and choline. The symptomatology as described was one in which the hair on the entire body excepting the head and tail falls out, leaving the trunk naked. The denuded areas showed a reddening, and sores developed. Woolley[2] identified this factor as inositol or phytin. Norris and Hauschildt[3] reported the development of somewhat similar lesions on a diet deficient in pantothenic acid and inositol.

Using a basic diet of casein, 18; sucrose, 67; salts, 4; cod liver oil, 2, and butter fat, 9, supplemented with 20 ug. of thiamine, 15 ug. of riboflavine, 10 ug. of pyridoxine, 0.5 mg. of nicotinic acid, 1.0 mg. of choline, 10 ug. of pantothenic acid and 50 ug. of β-alanine, we noted after six weeks a slight loss of hair on the back, and some graying. On the same basic diet with the same supplements, but with added inositol at 250 ug. daily, we noted exactly the same symptoms. Following both groups of 100 mice each for three months, no differences were observed. Thus, we have been unable to detect any effect from added inositol.

Using the Norris and Hauschildt diet, which is deficient in both inositol and pantothenic acid, we observed in 100 mice all the symptomatology reported by these workers, but immediate responses are observed to 150 ug. of pantothenic acid daily.

The mouse on a diet including thiamine, riboflavine, nicotinic acid, β-alanine, pyridoxin, pantothenic acid, choline and inositol responds to Labco Rice Polish Factor II, at 250 mg. daily.

It is suggested that the discrepancies observed are due to genus variation, imbalance of vitamin B complex members or altered intestinal bacterial flora. Under our experimental conditions, inositol has no effect on the nutrition of the Rockland strain black mouse. Furthermore, pantothenic acid, while curing the skin lesions described by Norris and Hauschildt[3]

[1] D. W. Woolley, *Jour. Biol. Chem.*, 136: 113, 1940.

[2] D. W. Woolley, SCIENCE, 92: 384, 1940.

[3] E. R. Norris and J. Hauschildt, SCIENCE, 92: 316, 1940.

does not completely cure the graying of the fur, which responds to Labco Rice Polish Factor II. It is to be emphasized that we used black mice, whereas Woolley used white albino mice. Our results agree with those implied by György and Poling[4] to be published.

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NEED FOR THE PRESERVATION OF NATURAL AREAS EXEMPLIFYING VEGETATION TYPES

THE communication on this subject by Dr. Henry I. Baldwin in SCIENCE for January 24, 1941, should arouse not only ecologists but all interested in natural history, whether merely amateurs or people seriously engaged in botanical or zoological work.

Dr. Baldwin, in concluding his statement, says that "until data are circulated on (a) what vegetation types (and animal communities) are at present adequately represented in protected areas and (b) what other types should be so protected . . . we shall go on setting aside reserves in hit-or-miss fashion, duplicating some excessively and overlooking others until it is too late."

It must certainly be admitted that we have been acting not merely in the "hit-or-miss" fashion that Dr. Baldwin warns against, but with especial emphasis on the "miss" part of the alternative. We have secured really enormous reservations of the least important kinds—high mountain areas—because they are of no commercial value and nobody objects much, and we have as a rule failed entirely to protect examples of the most important of all kinds of areas and those which are disappearing most rapidly. These are the last and rapidly vanishing remnants of the various types of primeval forest.

The U. S. Forest Service, which alone has the power and opportunity to give us such reservations on any considerable scale, has persistently failed to recognize this obligation to the American public.

The so-called "primitive areas," "roadless areas," "recreation areas," etc., which the Forest Service has established had first to pass a searching test for absolute commercial worthlessness before selection. Naturally, they consist almost entirely of high, rocky, barren, nearly or quite treeless areas, which are inhospitable to most forms of plant and animal life, and which were safe from exploitation anyway because nothing exists there to exploit. Were they made wild life sanctuaries, that would be one thing to be thankful for, but they are nothing of the kind. Quite the opposite.

[4] Paul György and C. E. Poling, *Proc. Soc. Exp. Biol. and Med.*, 45. 773, 1940.

Those interested in the ecological side of zoology and botany or in the preservation of areas of especial scenic, geological or other scientific interest should wake up to the fact that of the vast extent of our immense country the national parks are the only areas required by law to be kept in a natural state.

This is not an ideal state of things, for the protection of the national parks can not be as complete as it should be, owing to the necessities of providing for the tourist traffic. The parks consist also in too large proportion of high mountain areas, and their extent of fine primeval forest with trees of any considerable size is far less than commonly supposed, yet they contain all we have of undisturbed nature that has any prospect of surviving. The National Park Service realizes this and tries to protect the natural plant and animal life and scenery of the parks.

There are still on government-owned lands at least three or four more considerable areas of outstanding scenic and scientific interest in urgent need of protection. Only by making them national parks can we save them.

Some of the existing parks also need to be enlarged in order to serve their purpose properly. For instance, a number of them are composed so nearly exclusively of high-altitude areas that they can not provide winter range for the large mammals that they are supposed to protect. We need also to safely protect as "national monuments" a number of most interesting localities of too small area for national parks.

Thirty years' experience shows that no action toward fulfilling the requirement of the nation which Dr. Baldwin's letter pointed out can be expected from any government bureau we have now, or have any prospect of having under a government constituted as ours is, except the National Park Service.

Heartily as we may agree with Dr. Baldwin in regard to the need of more land reservations for scientific purposes, we must dissent from his assertion that the first thing to do is to spend a matter of years in an "inventory" of desirable areas. The most important natural areas and the most immediately threatened ones are well known now. What we need is action before it is too late.

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RESEARCH IN TROPICAL AMERICA

BARRO COLORADO ISLAND in the Canal Zone was set aside as a reserve for biological study and its preservation has recently been assured by Act of Congress. In a recent visit there we were able to secure two-toed and three-toed sloths, armadillos, anteaters and iguanas in abundance and in good condition for studies of their respiratory metabolism. These animals were