The product is of such physical condition as to be well suited for use as a conditioner in mixed fertilizer or for direct application. It promises to be of great importance in offering a cheap nitrogen carrier which, used in mixed fertilizer, will prevent caking of the mixture and keep it in condition suitable for easy distribution. The condition of the nitrogen being partly water-soluble and partly water-insoluble makes it of essential value where danger of leaching or loss through drainage is encountered. Substitution of this material for part of the inorganic materials in the fertilizer mixtures will also be of value in diminishing the burning effect of highly concentrated mixtures, as the amount of water-soluble nitrogen would be reduced thereby.

The advantages of ammoniated peat from the standpoint of fertilizer use are numerous and apparently convincing, and in addition both peat and ammonia from which it is made are cheap and abundant. There are estimated to be 14 billion tons of peat covering 110 million acres in the United States, and ammonia as produced from nitrogen fixation processes is one of the cheapest forms of nitrogen. While the process of manufacture has not yet been worked out, indications are that it will be relatively simple and cheap. Investigations on the details of the technical problems involved are being actively prosecuted.

In the soils unit of this bureau, H. G. Byers and I. C. Fenstal, while engaged on a study of the decomposition of peat, on heating it with aqueous ammonia in a closed vessel obtained a peat product with an increased nitrogen content.

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AN ACCURATE METHOD FOR MEASURING NEW-BORN MICE

WHILE carrying on growth studies of the mice of the genus *Peromyscus*, it became necessary to devise some method for the accurate measurement of newborn and very young mice. For the first two or three days after birth, these mice are so small, squirmy and curled in posture that it is almost impossible to take accurate measurements of the total length, tail length and hind foot by the usual hand methods.

The idea was therefore conceived of taking pictures of each litter with a Leica camera. A metric scale was pictured at the same exposure so that the mice were all taken at a fourth natural size. The negatives were then projected upon a screen by means of an ordinary lantern slide projector at forty times the negative size or ten times natural size. The measurements were then taken from the screen picture and divided by ten. The curved areas, such as the total length, were measured with a pair of dividers. The cost per picture is nominal where a Leica camera and a projecting apparatus are available, and the accuracy of this method fully compensates for the small amount of time and labor involved. It is suggested that this method may also prove efficient in measuring other small animals.

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A NEW SOURCE OF WORKING CURRENT FOR POTENTIOMETERS

THE writer has observed that a two-volt primary battery on the market, known as an "air-cell" battery,[1] has characteristics which make it an almost ideal source of working current for a potentiometer.

This battery has a rated capacity of 600 ampere hours and a flat voltage discharge curve if the current drain does not exceed the specified 650 milliamperes. This is ample capacity for a potentiometer for many months' use.

The writer has used such a battery in place of a storage battery and has found that when protected against changes of temperature the working current will remain constant for hours and in some cases an entire working day without adjustment.

The above features, together with its cheapness and continuity of service, make it a very desirable source of current. The potential of a storage battery drops steadily until it reaches a point where it must be replaced and recharged.

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SPECIAL ARTICLES

THE EFFECT OF GALACTOSE FEEDING UPON DEPANCREATIZED DOGS

THE studies of Roe and Schwartzman,[1] in which it was shown that diabetic subjects have practically as good a tolerance for galactose as normal subjects, suggested that it would be of interest to study the influence of pancreatectomy upon the metabolism of galactose. We have therefore undertaken an investigation of the metabolism of galactose in depancreatized dogs,

[1] J. H. Roe and A. S. Schwartzban, *Jour. Biol. Chem.*, 96: 717, 1932.

[1] Eveready Air-Cell "A" Battery, manufactured by the National Carbon Company.

and wish to make a brief preliminary report at this time.

Dogs were placed in metabolism cages and water was allowed *ad libitum*. Twenty-four hour samples of urine were collected under toluene. The principal chemical data obtained were determinations of the fasting blood sugar and of the amounts of galactose, glucose and nitrogen of the urine, and the D:N ratio. After obtaining control data the dogs were totally depancreatized under ether anesthesia. Our usual procedure was to determine the D:N ratio of the urine upon the second and sometimes third days after pancreatectomy under fasting conditions, and the dogs were then fed galactose in water in amounts varying from 1 to 6 grams per kilo per day for periods varying from 4 to 9 days. During the period of galactose feeding the amounts of galactose, glucose and nitrogen in the 24-hour samples of urine were determined and the D:N ratio was calculated. The fasting blood sugar was also determined each day upon samples of blood collected in the morning before galactose was fed. Following these studies the surviving animals were given food mixed with galactose, and observations, together with irregular chemical studies, were made until the animals died.

In control studies the dogs were found to excrete in the urine 17 to 30 per cent. of the ingested galactose. Following pancreatectomy the urinary excretion increased to quantities ranging from 32 to 57 per cent. of the ingested galactose.

After pancreatectomy the D:N ratio of the urine during galactose feeding either kept at essentially the same value as obtained in the control studies before galactose feeding or in some cases decreased considerably. This finding shows that the galactose was not converted into glucose by the depancreatized animals, and since only 32 to 57 per cent. of the ingested galactose was excreted in the urine, the evidence indicates that about one half of the galactose fed to the depancreatized dogs was retained in their tissues and apparently was utilized.

TABLE I

COMPARISON OF GALACTOSE AND GLUCOSE TOLERANCE OF DEPANCREATIZED DOGS

Dog	Days after Pancreatectomy	Feeding	24-Hour Urine			
			Galactose Gms.	Glucose Gms.	Nitrogen Gms.	D:N
1	21	18 gm. galactose	8.84	4.69	2.43	1.9
	22	18 gm. glucose	.....	17.50	2.26	7.7
2	7	18 gm. galactose	7.29	7.28	2.95	2.4
	8	18 gm. glucose	.....	15.35	1.89	8.1
3	8	30 gm. glucose	.....	26.23	4.56	5.8
	9	30 gm. galactose	9.95	15.16	4.30	3.5
4	6	32 gm. galactose	13.20	10.58	3.21	3.3
	7	32 gm. glucose	.....	27.60	2.96	9.3
	8	32 gm. galactose	13.44	5.41	2.11	2.5
5	8	21 gm. galactose	7.25	4.00	.....	.....
	9	21 gm. glucose	.....	15.50	.....	.....

In Table I are shown comparative studies of galactose and glucose feeding to depancreatized dogs upon consecutive days. When glucose was fed there was a much greater excretion of glucose in the urine than when galactose was fed and the D:N ratio was approximately 2 to 4 times as great. Even if one totals the amounts of galactose and glucose that were excreted in the 24-hour period of galactose feeding (a procedure that is unwarranted because the normal dog excretes galactose in the urine) it will be found that there was less total sugar excreted upon galactose feeding than upon glucose feeding. These data show that there is a preferential utilization of galactose as compared with glucose by the depancreatized dog.

The fasting blood sugar of 5 depancreatized dogs ranged from 221 to 350 mg per cent. during the period when galactose only was fed. While receiving galactose the fasting blood sugar of one dog increased from 261 to 304 mg per cent. and that of the others either remained at essentially the same level or diminished, the greatest decrease being from 350 to 252 mg per cent. in 3 days of galactose feeding.

By galactose feeding we were able to prevent or suppress some of the sequelae of pancreatectomy. Vomiting was either suppressed or prevented in the dogs receiving galactose by mouth or intravenously. Apparently there is no other conclusion than that the galactose was responsible for this favorable result. As a result of the prevention of vomiting, the dogs were able to take water and did not become dehydrated. Ketone body formation and acidosis developed in our animals, but most of them survived the acute period of ketonuria, during which galactose only was administered in some instances, while in other instances sodium bicarbonate was administered in addition to galactose.

The survival periods of the depancreatized dogs, which did not receive insulin and to which we administered galactose, are as follows: One dog lived 5 days; 2 dogs 6 days; 1 dog 7 days; 1 dog 12 days; 1 dog 14 days; 1 dog 19 days; 1 dog 30 days; and 1 dog was sacrificed 41 days after pancreatectomy. There is no record in the literature of survival periods of totally depancreatized dogs not receiving insulin

through the post-operative period that are as long as some of those obtained by us with galactose feeding.

The influence of galactose feeding with respect to healing of the dog's operative wound is apparently of significance. It is very well known that the abdominal incision of the depancreatized dog becomes infected and does not heal. We obtained complete healing of the mid-line incision of the dogs which lived 30 and 41 days, and in the other dogs, which lived 10 days or more, there was more or less healing. Apparently there is no other conclusion than that galactose feeding had some influence in bringing about these favorable results.

Grateful appreciation is expressed to Smith, Kline, and French, Inc., Philadelphia, Pa., for donations of galactose.

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THE INCIDENCE OF COLOR BLINDNESS AMONG RACES[1]

IN SCIENCE in 1930,[2] the writer announced the beginning of an experimental study of the incidence of color blindness among Indians. Since then there have been, under his direction, expeditions to test various races in America by trained investigators, *i.e.*, four expeditions to test Indians—at Santa Fé and Albuquerque, New Mexico; Holy Rosary and St. Francis Missions in South Dakota; Haskell Institute at Lawrence, Kansas; in Colorado and New Mexico at various points, where we tested Utes, Apaches and Navajo; three expeditions to test Mexicans, the native-born (Spanish-Americans) and another to test immigrant Mexicans in Colorado, and still another to test the natives of Old Mexico in Mexico City; three expeditions to test Negroes, one in Tennessee, one in North Carolina and still another in Colorado. The unselected whites and Jews were tested in and around Denver.

The first three Indian expeditions were made possible by a joint grant between the National Research Council and the University of Denver. All the other expeditions were financed by the university.

The test used in the present investigation was the Ishihara Color Blindness Test, which has been used rather extensively in this country, particularly by Miles, Haupt and Clement. Our procedure was to test one eye at a time, but followed the general directions of the author of the test. By means of automobile goggles, with the glasses punched out and exchangeable blinds, one eye was tested at a time. It should be said that no case of monocular color blindness was discovered by the investigator. No case of total blindness was brought to light; consequently these results are for complete and incomplete red-green blindness. With results from the same test Miles[3] has reported for various groups of white males

[1] Paper read before the Colorado-Wyoming Academy of Sciences on November 25, 1932.

[2] T. R. Garth, "The Color Blindness of Indians," SCIENCE, 71: 468, 1930.

[3] W. R. Miles, "One Hundred Cases Color Blindness

TABLE I

THE INCIDENCE OF COLOR-BLINDNESS AMONG RACES OBTAINED WITH THE ISHIHARA COLOR-BLINDNESS TEST BY GARTH *et al.*

Racial group	Males			Females		
	Number tested	Color-Blind		Number tested	Color-Blind	
		No.	Per cent.		No.	Per cent.
Whites, unselected	795	67	8.4	232	3	1.3
" Jews	200	8	4.0	175	0	0
Indians, F. B. var. tribes	562	14	2.5	337	0	0
" " " Navajo	535	6	1.1	456	3	0.7
" mixed bloods	480	25	5.2	523	4	0.8
Mexicans, Old Mexico	571	13	2.3	494	3	0.6
" immigrants	523	13	2.5	469	4	0.9
Spanish-Americans	346	13	3.8	390	3	0.8
Negroes, Southern	538	21	3.9	496	4	0.8
" Northern	254	7	2.8	165	0	0