have been shown to differ in their sensitivity to cyanide,[6] their carbonic anhydrase activity,[7] their cholinesterase activity,[8] and many other particulars.

Summary. Lactic acid, pyruvic acid, inorganic phosphorus, phosphocreatine, and ATP-ADP were determined in liquid air fixed brains of normal and convulsed cats. In normal brains the levels in cerebellum and cerebrum were approximately the same. In convulsed brains, however, the lactic acid increases were much smaller and phosphocreatine levels were higher in cerebellum than in cerebrum despite the fact that seizure activity was approximately of equal intensity in both parts.

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17236. Lactate, Pyruvate, and Acid-Soluble Phosphates in Monkey Brains Treated with Carbon Dioxide and Electric Shock.*

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(Introduced by Warren S. McCulloch.)

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There now exists in the literature a considerable body of data regarding the effect of seizures upon the lactate, pyruvate, and acid-soluble phosphate levels in the brains of dogs,[1] rats,[2] and cats[3,4,5] under various conditions. It seemed, therefore, desirable to extend these analyses to animals higher in the phylogenetic scale, including man. As a step toward this end, a limited series of monkeys has been studied in the normal state, treated with carbon dioxide,[4] electric shock, and electric shock plus carbon dioxide.[6]

Methods and Results. Treatment of the animals, brain wave recordings, and analysis of the liquid air fixed brains were carried out as described in previous reports from this laboratory.[3-6] The results are summarized in Table I. Comparison with the data on other animals shows that the levels of all constituents assayed are of the same magnitude in monkeys as in dogs, cats, and rats and the changes brought about by seizures and carbon dioxide inhalation are in the expected direction.

Discussion. The results reported show that it is probably justifiable to extend conclusions drawn from data on experimental animals to man, as far as the brain constituents here assayed are concerned, since it seems unlikely that there would be a sharp change between man and monkey when monkey does not differ from other mammals.

Another point which is clearly demonstrated by a comparison of animals 3 and 4 is that the rise in lactate, pyruvate, and inorganic phosphate elicited by seizures is the result of the hyperactivity of the brain and not of the stimulus which initiates said hyperactivity. There is an indication in the data that the directly driven response to the stimulus alone, without seizures, may cause a fall in phosphocreatine (animal 4) and possible adenosine triphosphate; but in the case of the latter

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TABLE I.
Lactate, Pyruvate, and Acid-Soluble Phosphates in Monkey Brain.

Animal No.	Lactate		Pyruvate		Inorg. P		Phospho-creatine		Adenosine Tri-PO_4		Adenosine Di-PO_4		Treatment
	Cb*	Cx	Cb	Cx	Cb	Cx	Cb	Cx	Cb	Cx	Cb	Cx	
1	1.68†	1.80	0.171	0.157	3.65	3.93	1.70	1.33	1.40	1.68	1.74	1.27	Control
2	1.44	1.41	0.078	0.083	4.20	4.71	1.27	1.15	1.51	1.43	1.76	1.91	30% CO_2, 70% O_2 for 3 min.
3	5.22	5.40	0.263	0.269	6.32	5.67	0.47	1.12	1.14	1.18	1.73	1.65	10 sec. electric shock 55 sec. seizure
4	1.74	1.95	0.163	0.168	4.44	4.62	0.62	0.54	1.09	1.34	1.33	1.11	30% CO_2, 70% O_2 for 3 min. 10 sec. electric shock 55 sec. lag period No seizure

* "Cb" and "Cx" designate cerebellar and cerebral cortex, respectively.
† All values expressed as mM/1000 g (wet wt) tissue.

compound, the changes are too small, considering the precision of the methods of analysis, to allow conclusions to be drawn without more extensive studies on a larger series of animals. Such a study on monkeys is, at present, beyond our means.

Summary. The brains of normal monkeys and those treated with carbon dioxide and electric shock were fixed with liquid air and analysed for lactate, pyruvate, and acid-soluble phosphates. The levels of these constituents and their change under the above conditions were shown to be of the same magnitude and in the same direction as those found in similarly treated dogs, cats, and rats.

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17237. Effect of Environmental Temperature on the Response of Mice to Whole-Body Roentgen Radiation.

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A low environmental temperature for frogs and new-born rats is accompanied by decreased body temperature and oxidative metabolism, and relatively low radiosensitivity.[1-3] In the mouse, when the temperature regulating mechanism is functioning normally, a cold environment produces only a slight depression of body temperature, and oxygen consumption is elevated.[4,5] This increase in oxidative metabolism has been attributed to increased thyroid activity.[6,7] Since thyroid

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