In general, the duration of action shows similar features; that is, it is shorter when the alkyl group becomes lengthened (Fig. 2). In the series of normal alkyl derivatives, the critical compound is the one that possesses 6 C-atoms at R; and in the series of secondary alkyl derivatives, the critical compound is the one having 7 C-atoms at R, beyond which the duration of action begins to increase.

If R is phenyl, the compound, phenobarbital, has the well-known prolonged action; but if the ethyl group is replaced by a methyl, the resulting substance has a larger M.A.D. and M.L.D., and a shorter duration of action, as compared with phenobarbital.

The author is indebted to Dr. K. K. Chen for criticisms and assistance in the preparation of this manuscript.

7393 C

Short Acting Barbituric Acid Derivatives.

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In a previous communication,[1] it was pointed out that there is obvious relationship between the pharmacological action and the chemical structure of certain barbituric acid derivatives, and that compounds with long alkyl groups have a shorter duration of action. The present report deals with the evaluation of 12 such compounds, all of which were prepared by Shonle, Waldo, Keltch, and Coles.[2]

Typical hypnotic and anesthetic properties were observed with all the substances except one, injected intraperitoneally, in albino rats. Their minimal hypnotic doses (M.H.D.), minimal anesthetic doses (M.A.D.), and minimal lethal doses (M.L.D.) were determined, and their therapeutic indices calculated as shown in Table I. Compounds numbered 1, 2, 3, and 7 were also tested in dogs, being effective either by vein or by mouth. It is curious that compound numbered 12, 1,3-dimethyl-butyl-ethyl barbituric acid, is devoid of any hypnotic or anesthetic action, but on the contrary, produces convulsions. The substance is also highly toxic.

[1] Swanson, E. E., PROC. SOC. EXP. BIOL. AND MED. (in press).

[2] Shonle, H. A., Waldo, J. H., Keltch, A. K., and Coles, H. W., Read at the Am. Chem. Soc. Meeting, St. Petersburg, Florida, Mar. 25-30, 1934

TABLE I.

No. of Compound	Barbituric Acid	M.H.D. mg. per kg.	M.A.D. mg. per kg.	M.L.D. mg. per kg.	Average Duration of Action min.	Therapeutic Index: M.L.D./M.A.D.
1	2,4-dimethyl-pentyl ethyl-sodium salt	50	70	140	63	2.00
2	1,4-dimethyl-pentyl-ethyl-sodium salt	60	80	240	69	3.00
3	1-propyl butyl-ethyl-sodium salt	20	30	65	75	2.16
4	1,3-dimethyl-pentyl-ethyl-	50	70	200	102	2.85
5	4-methyl-heptyl-ethyl-	60	80	230	115	2.87
6	2,4-dimethyl-hexyl-ethyl-	60	80	230	132	2.87
7	2-ethyl-hexyl-ethyl-sodium salt	50	80	230	154	2.87
8	4-methyl-pentyl-ethyl-	50	70	180	155	2.57
9	5-methyl-2-ethyl-hexyl-ethyl-	100	140	340	158	2.42
10	2-methyl-pentyl-ethyl-	50	70	180	225	2.57
11	3-methyl-2-ethyl-hexyl-ethyl-	120	160	400	255	2.50
12	1,3-dimethyl-butyl-ethyl-	none*	none*	10*	—	—

*Convulsions.

7394 C

A Procedure for Determining Distribution of Blood Groups in Mummies.*

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Some unexpected differences in the distribution of blood groups observed by us a year ago[1, 2] among the "Blackfeet' and "Blood" tribes of American Indians suggested that the different tribes may

* Grateful acknowledgement is made to Dr. J. Bronfenbrenner, who suggested the problem and offered kindly advice and criticism in the development of methods, to Drs. G. D. Williams and H. A. McCordock, who shared with me the mummy material which they secured from the Peabody Museum of Harvard, and to Dr. T. B. Pote, through whose courtesy the cow serum was obtained.

[1] Matson, G. Albin, PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 1380.

[2] Matson, G. A., and Schroder, H. F., *J. Immunol.*, 1933, **25**, 155.