TABLE I

THE EFFECT OF SODIUM 1,3-DIMETHYL-BUTYL-ETHYL BARBITURATE ON RAT BRAIN SLICE RESPIRATION

Final barbiturate concentration	Substrate	Number of experiments	Average per cent. 0–60 Min.	Inhibition of QO_2 60–120 Min.
Mgm per cent.	200 mgm per cent.			
0.1	Glucose	3	+ 3	− 6
1.0	"	5	− 7	− 6
5.0	"	2	− 17	− 19
10.0	"	6	− 16	− 25
50.0	"	6	− 43	− 77
10.0	Succinate	2	− 7	− 3
50.0	"	2	+ 3	− 2

From the results given in Table I it is apparent that sodium 1,3-dimethyl-butyl-ethyl barbiturate is effective in producing inhibition of glucose oxidation of rat brain slices. Assuming equal distribution of the drug, calculations from data of Swanson and Chen,[3] on the rat, establish approximate tissue concentrations of 1 and 2 mgm per cent. for convulsive and lethal doses, respectively. A comparable inhibition of rat brain oxidation is observed with equivalent concentrations of sodium pentobarbital, but when administered to the intact animal in doses equivalent to those of the aberrant barbiturate it produces depression. These results are not explained by Quastel's theory of anesthesia.

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INDICATIONS OF AN INCREASE IN NUMBER OF C-ATOMS IN ACIDS AND NUMBER OF ACIDS IN SEED FATS WITH ADVANCE IN EVOLUTIONARY POSITION

IN the latest compilation of analyses of seed fats,[1] data from 16 natural orders (Engler and Prantl classification) are given. When the component acids of the families of these orders are considered it is found that 7 orders have an increase in the number of acids, 8 have an equal number of acids and one has a decrease in the number of acids with an advance in evolutionary position of their constituent families.

When the number of carbon atoms of these acids is considered it is found that 8 orders have an increase in the number of C-atoms, 6 have equal number of C-atoms and 2 have a decrease in the number of C-atoms with an advance in evolutionary position. If, however, the terminal families of those analyzed of the Malvales, Myrtiflorae, Contortae and Tubiflorae (*i.e.*, respectively, Sterculiaceae, Myrtaceae, Asclepiadaceae and Acanthaceae) be removed from consideration, then 3 of these 4 orders show an increase in the number of acids and all 4 show an increase in the number of C-atoms in these acids with an increase in evolution. An increase in the number of C-atoms indicates in these instances an increase in molecular weight of the acids which contain them.

The data may be summarized as follows: *Fagales*—Betulaceae Number of C-atoms 14–16–18, number of acids 5; Fagaceae 16–18–24, acids 6: *Urticales*—Ulmaceae, 10–12, acids 2; Moraceae 18, acids 3: *Santalales*—Santalaceae 16–18, acids 2; Olacaceae 16–18–20–26, acids 8: *Ranales*—Berberidaceae 16–18, acids 4; Menispermaceae 16–18–20, acids 6; Magnoliaceae 16–18, acids 4; Anonaceae 16–18–24, acids 6; Myristicaceae 10–12–14–16–18, acids 8; Lauraceae 10–12–14–16–18, acids 6: *Rhoeadales*—Papaveraceae 14–16–18–20, acids 9; Cruciferae 16–18–20–22–24, acids 9: *Rosales*—Rosaceae 14–16–18–20, acids 10; Leguminosae 14–16–18–20–22–24, acids 9+: *Geraniales*—Tropaeolaceae 16–18–22, acids 5; Linaceae 14–16–18–20, acids 7; Rutaceae 16–18–24, acids 6; Simarubaceae 10–12–14–16–18, acids 10; Burseraceae 16–18–20, acids 5; Meliaceae 14–16–18–20, acids 7; Vochysiaceae 12–14–16–18, acids 5+; Euphorbiaceae 14–16–18–20, acids 10: *Sapindales*—Buxaceae 18–20, acids 3; Anacardiaceae 14–16–18–20, acids 6; Celastraceae 16–18, acids 6; Salvadoraceae 8–10–12–14–16–18, acids 7; Staphyleaceae 16–18, acids 4; Hippocastanaceae 16–18, acids 5; Sapindaceae 10–12–14–16–18–20–22–24, acids 11: *Rhamnales*—Rhamnaceae 16–18, acids 5; Vitaceae 16–18–20–22, acids 8: *Malvales*—Tiliaceae 16–18, acids 4; Malvaceae 14–16–18–20, acids 7; Bombacaceae 14–16–18–20–24, acids 7; Sterculiaceae 16–18, acids 4: *Parietales*—Caryocaraceae 14–16–18, acids 5; Theaceae 14–16–18–20, acids 6; Guttiferae 14–16–18–20–22, acids 7; Dipterocarpaceae 14–16–18–20, acids 6; Flacourtiaceae 16–18, acids 7; Passifloraceae 16–18–20–26, acids 8; Caricaceae 16–18–20, acids 5: *Myrtiflorae*—Elaeagnaceae 16–18, acids 5; Lecythidaceae 14–16–18, acids 5; Combretaceae 14–16–18–20, acids 6; Myrtaceae 16–18, acids 5: *Umbelliflorae*—Araliaceae 16–18, acids 4; Umbelliferae 16–18, acids 4: *Contortae*—Oleaceae 16–18, acids 4; Apocynaceae 16–18–20–24, acids 7; Asclepiadaceae 16–18, acids 4: *Tubiflorae*—Convolvulaceae 16–18, acids 5; Verbenaceae 16–18, acids 4; Labiatae 18, acids 3; Solanaceae 14–16–18–20, acids 6; Scrophulariaceae 16–18, acids 5; Pedaliaceae 16–18–20, acids 5; Acanthaceae 14–16–18, acids 6: *Rubiales*—Rubiaceae 10–14–16–18–20, acids 7; Caprifoliaceae 16–18–20, acids 6; Valerianaceae 16–18, acids 5; Dipsacaceae 16–18, acids 4.

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[1] T. P. Hilditch, "The Chemical Constitution of Natural Fats," John Wiley and Sons, 1940.