

is about 0.000000044 N. This value is subject to constant slight variations, diminishing as the blood passes through the lungs, increasing during the greater circulation; but variations of this kind are certainly very slight in the healthy organism. The value corresponds to a concentration of bicarbonates about ten times as great as that of free carbonic acid. Together the acid and its salts make up the larger part of all the carbonic acid, and a very considerable fraction of all the dissolved molecules of the blood. In disease, especially diabetic coma, the hydrogen ion concentration may rise to 0.0000001 N, or perhaps higher; when acid is injected into the blood the value may be greater still, but death speedily ensues, and it is certainly impossible during life that there should be any considerable permanent variation.

Increase in acidity of the blood can occur only in association with marked diminution in the concentration of bicarbonates, which may fall to less than one third of their normal amount, greatly impoverishing the blood in respect to carbonic acid, and interfering with its excretion. This is due to the fact that the amount of free carbonic acid in the blood is under the independent control of the respiratory center, and when acids decompose bicar-