with a compensatory rise in the chloride from 280 to 305 and cholesterol from 140 to 150. The base-forming diet produced the converse changes, serum phosphorus from 6.1 to 7.5, alkaline reserve from 48 to 56 vol. per cent, total base from 148 to 154 vol. per cent. The albumin-globulin ratios, percentage fat and iodine numbers of the fat were all normal. The hemotological data were also unaltered in both groups.

The animals maintained on acid-forming diets showed rickets clinically and histologically while those fed on base-forming diets showed normal bones. The animals on the base-forming diet in particular showed the greater percentage of ash, 61%, and had heavier bones while those on the acid-forming diet showed 54% of ash according to analyses of the femora. The animals that had been exposed to the light showed a higher ash content, 54% compared with 49% of those in darkness. The rats on base-forming diets showed a more marked gain in weight, 17 gm. per week as compared with 7 gm. per week for the animals on the acid-forming diets. This weight contrast was striking for the summer, less so for the spring and least for the winter.

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Effect of Division of Dorsal Roots of Cervical Nerves Upon Diaphragmatic Respiratory Movements.

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In a study of the neuro-muscular mechanism of respiration, carried out on cats, it has been observed that, in many cases, division of the vagi is followed not only by a marked decrease of the respiratory rate, but also by a diminution in amplitude of diaphragmatic movements, while costal movements increase in depth. Subsequent section of the dorsal cervical (phrenic) nerve roots in these cats is attended by very little further change in respiratory rate or movement.

When, on reversing the order of experimental procedure, the dorsal roots of the cervical nerves (iii, iv, v, vi) are divided first, both a diminution in amplitude of diaphragmatic contractions and slowing in rate ensues, and subsequent division of the vagi brings about almost no further change in respiratory rate.

That respiratory impulses to the diaphragm may still bring about increased depth of diaphragmatic movement after section of the dorsal roots of the cervicals, has been shown by division of the dorsal spinal nerve roots of the intercostals in the thoracic region with the resulting diminution in costal movement. Under such conditions, there is an increase in the magnitude of diaphragmatic movement. This is similar to the increase in costal movements observed by us some years ago when, after division of the dorsal spinal nerve roots in the thoracic region, the phrenics were excised and an increase in the magnitude of costal movement was observed.[1]

The fact that diaphragmatic movement and not costal, is diminished in magnitude by division of the vagi, appears to indicate a closer relationship of the vagi to the phrenics than to the thoracic roots of the nerves concerned in the control of costal respiratory movements. These latter appear to have central stations as high as the posterior *corpora quadrigemina,* section behind which affects costal respiratory movement to a much greater extent than diaphragmatic.[2]

In our earlier work,[3] the decrease both in magnitude and rate of costal movements on division of the thoracic and cervical dorsal spinal nerve roots was pointed out. It is now suggested that a distinction may be made between the decrease in *amplitude* with little change in rate, produced by division of the dorsal roots of the spinal nerves in the thoracic region, and the decrease in *rate* which seems to be a more characteristic result of the division of the dorsal roots of the spinal nerves in the cervical region, particularly those of the phrenic nerves from the diaphragm.

[1] Pike, F. H., and Coombs, H. G., *Science,* 1922, lvi, 691, and the papers there cited.

[2] Coombs, H. C., *Science,* 1929, lxx, in press.

[3] Coombs, H. C., *Am. J. Physiol.,* 1918, xlvi, 459.