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Bilateral Reversal of Internal Organs of the Cat

VARIATIONS in the arrangement of blood vessels in mammals are rather common, particularly in the venous system. A complete reversal of all organs, however, is quite uncommon. Gribble (*1*) states that he has seen only one such animal among the many cats he has examined in the past few years. The present specimen is the only example this author has seen in an aggregate of about six years' experience with cat dissections. A brief description of the organs affected follows.

The esophagus followed the trachea on the right side until it passed the origin of the bronchi where it proceeded slightly to the right of the mid-line to enter the stomach.

The entire stomach was located to the right of the median line with the pyloric end on a line below the enlarged cardiac end. The greater curvature lay at the extreme right while the lesser curvature was located in a medial position.

The duodenum proceeded to the left and then turned caudad, following the left lateral margin of the abdominal cavity.

The liver presented a reversal in position. The larger portion lay on the left side. The smaller portion occupied the right side. The common bile duct passed caudad on the left side to enter the duodenum.

The pancreas was reversed end for end to correspond to the general reversal of the abdominal viscera. The spleen lay along the greater curvature of the stomach which placed it on the right side of the body.

The kidneys seemed to be in a normal position, the left lying about 1 cm farther caudad than the right.

The left lung was larger.

A complete reversal in the position of the heart was encountered, the apex directed to the right. This of course reversed the positions of the heart chambers. The major blood vessels conformed to this shift. The aorta emerged from the right ventricle and made its arch to the right instead of the left. The innominate, carotids, and subclavians were likewise reversed. A corresponding reversal was found with the veins.

It is interesting to note that only the structures within the peritoneum and mesenteries have been affected. The kidneys, lying retroperitoneally, apparently were unaffected. In this respect the animal reported here differs from that reported by Gribble (*1*).

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Olfactory Thresholds in the International Critical Tables

PROBABLY the most extensive and available collection of olfactory thresholds is contained in the International Critical Tables (*1*), and researchers quite often check their own threshold results against the data therein. In compiling the data, Zwaardemaker has translated them all into a common unit, molecules per cc of air. The method of translation is given as follows:

"The olfacty of an odor is the threshold or minimum perceptible concentration expressed in gms per cc which multiplied by $6.06 \times 10^{21}/M$, where M is the molecular weight, gives molecules per cc." (*1*, p. 360.)

Unfortunately, the formula given is in error. Avogadro's number, which should be the basis of this calculation, is about 6.023×10^{23}. The fraction in the second decimal place is of very little importance, but the exponent is quite important. It seemed that the exponent given in the formula in the tables might be a typographical error, but calculations based on several thresholds taken from the original Henning (*2*, p. 411) resulted in the numbers found in the tables. The thresholds in the tables are, therefore, in error by a factor of 100, that is, it would require 100 times the number of molecules per cc indicated to reach threshold. Perhaps this is one reason why olfactory thresholds have seemed hard to duplicate!

It is, fortunately, very easy to correct the errors in exponents. The thresholds in the tables are given in the form $A \times 10^x$ molecules/cc. The values of x need only be increased by 2 in each case to give the correct value.

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