

229. *Melospiza melodia beata*. (Bangs). Mississippi Song Sparrow. (581u). The song sparrow is an abundant resident in Tippecanoe County, many staying in the same locality through the year. They begin to sing in February and are nesting by early April. Two or three broods are reared each season. There is no noticeable decrease in this species in the past 40 years.

230. *Calcarius pictus*. (Swainson). Smith's Longspur. (537). The only record for this longspur is April 16, 1932, when eight were seen on the Wea Plains five miles south of Lafayette. A female was secured and the skin is in our collection. This species may be more common than this single record indicates.

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## THE GROSS ANATOMY OF A TWO-BODIED LAMB

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Through the courtesy of a student, Mr. J. L. Fuelling, there came to my hands late last spring a female lamb exhibiting an interesting duplication of limbs and hind parts of the body. Such monstrosities are, of course, not uncommon, yet because each is usually a little different than any of the others, it seems worth while to make a record of the more gross abnormalities.

The animal in question is reported to have lived for about two hours, having been delivered by a veterinarian from a sheep which had borne a normal lamb the day before. At death it was embalmed with a phenol mixture and thus reached me in a fair state of preservation. I immediately turned the specimen over to two interested students, Mr. Maxwell Power and Mr. W. C. Davis, who carried out the dissections under my direction. Subsequently I made certain supplementary dissections myself.

Externally the lamb presented a single normal-sized head and neck and an undivided though excessively large trunk as far as the middle of the abdomen. At this level there was an abrupt bifurcation of the body, the two portions being complete, full-sized, and each possessed of a tail and pair of hind-legs. The fore-legs were likewise duplicated, but one pair occupied a useless position on the dorsal side of the body. The second pair would have served very creditably.

Observations on the internal anatomy were made from the ventral side, beginning first in the laryngeal region and carried progressively backward.

In the neck a perfectly regular arrangement of organs prevailed. Larynx, thyroid, blood-vessels, etc. appeared to be normal.

Modification of the thoracic cavity and its contained organs consisted primarily of increase in size. The volume of the cavity itself was at least a third above average, being correlated with the peculiar skeletal arrangement of this region to be described below. The lungs were

in a collapsed state but exhibited the size and distinct lobulation characteristic of the sheep. They enveloped in regular fashion the centrally located pericardial cavity and heart. This latter organ was considerably enlarged, but otherwise unchanged.

The first conspicuous departure from normal was seen in the derivation of blood vessels, particularly the arterial trunks, from the heart. The single aorta coming from the left ventricle assumed a T-shape configuration and sent large posterior aortae to the right and to the left. These proceeded along the dorso-lateral walls of the thorax, giving off branches en route, gradually diverging as they passed through the abdominal cavity until they came to be isolated in the separate bodies. The tributary vessels were not worked out. From the arching top of the T arose three arterial trunks, one median and two lateral. The former, identified as the common carotid, immediately divided into two anteriorly proceeding external carotids. The lateral vessels were right and left subclavian respectively.

This represents a considerable departure from the usual situation consisting of a single aortic arch from which is derived, on the one hand, a brachio-cephalic giving rise to carotids and right subclavian, and on the other, a left subclavian.

The anterior vena cava showed no distortion. Two separate post-cavas, however, ran from each division of the body and united just posterior to the diaphragm. The single vessel thus formed almost immediately received the hepatic vein and continued on to the heart in normal fashion.

Even more extensive structural duplication was seen in the abdominal cavity. Single in its beginnings, this cavity bifurcated and extended into each of the two complete bodies. There was, however, no dividing septum; the cavity was a single one, having merely a Y-shaped contour.

The esophagus pierced the dorsal side of the diaphragm and entered the single typical ruminant stomach. Leaving the stomach was the small intestine which for the first five and one-half feet of its length continued as a single tube. At this point it forked and each portion proceeded into its respective half of the body cavity. Two feet from the point of division on each side were found fully developed caeca, which marked the beginnings of the two large intestines. Both of these were about two and one-half feet in length and each finally terminated in an anus.

The organs associated (anatomically) with the digestive tube, i.e., liver, pancreas, spleen, showed no duplication. As far as could be determined their relations to the neighboring organs were regular.

Duplication in the excretory system was also apparent. Without going into the details of their connections, it may be said that there were two bladders, each receiving a pair of ureters from a corresponding pair of kidneys. These latter consisted of a large dorso-lateral pair and a dorso-median pair of about half size. Anterior-dorsally located adrenal bodies were associated with each kidney, those of the middle being proportionally reduced in size.

The immaturity of the reproductive organs made their dissection impracticable.

The most profound modifications were those involving the extensive duplication of skeletal parts. Whereas the abdominal cavity and its organs were only partly duplicated and the thoracic cavity not at all, almost two complete axial skeletons were present.

The cranium, of course, was single, but the first cervical vertebra, the atlas, consisted of two vertebrae with their median transverse processes fused. The two sets of articular processes thus present articulated with correspondingly enlarged occipital condyles at the base of the skull. Two complete vertebral columns proceeded posteriorly from this single fused atlas. The remaining six pairs of cervical vertebrae lay closely parallel to each other, loosely bound together by ligaments. At the level of the first thoracic vertebra the two columns diverged abruptly and extended posteriorly into the separate bodies until they terminated in the tail.

Each axis had a complete set of ribs. Those in the lateral positions were normal in size; those between the two columns, considerably shortened and the first three pairs unattached at their distal ends. The ribs of the right side of the right column and left side of the left united ventrally with a normal sternum. The shortened median ribs curved upwards and, with the exception of the aforementioned first three, attached to an improvised dorsal sternum.

Two pairs of normal scapulae were present with their associated fore-legs. The median member of each pair of legs lay on the dorsal surface of the thorax; the functional limbs represented the lateral members of the two pairs.

The two widely separated sacra with their pelvic girdles and appendages were in no way distorted.

The nervous system exhibited a duplication of parts to correspond to the double vertebral column. At the level of its emergence from the cranium through the foramen magnum, the spinal cord bifurcated and passed as two cords through the two neural canals of the fused atlases into the individual columns.

No observations were made on the distribution of muscles.