AN ANATOMICAL VERIFICATION OF THE READING OF A TERM IN EXTISPICY

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The technical term in extispicy, *tirānu*, was originally translated as "marks" or "signs."[1] Lutz amended this to "zones."[2] But as knowledge of the terminology advanced, the term came to be recognized as meaning "convolutions of the intestines."[3] No report seems to have been published in which an attempt has been made to verify this translation by anatomical investigation of the intestines of a sheep or lamb. I shall here report such a verification, together with an anatomical explanation for the traditional "numerology" of the *tirānu*.

I have been fortunate to know the owner of a small private abattoir, who has allowed me to have access to freshly-slaughtered lambs and has cooperated in altering his slaughtering practices to conform with the requirements of study of ancient Babylonian and Assyrian extispicy. This would pose insuperable inconvenience to a large modern abattoir of the kind usually found today, where large numbers of animals are slaughtered in rapid succession on a scale where leisurely inspections would be impossible, and experimental cutting of carcasses unthinkable.

In my examinations of the entrails of a number of lambs several interesting facts emerged relating to the livers, which were after all the main objects of extispicy of ancient times. But two specific points which I especially wished to establish related to the intestines, and the curious final remarks about them commonly found at the end of extispicy texts. We are continually informed in these texts that a certain number of *tirānu* have been observed. The number given is almost always an even number between ten and sixteen. We also know that in the rare instances where an odd number, such as 15, is given, it is considered to be an extremely unfavorable omen.[4] No reason ever seems to have been advanced in modern times to account for this, apart from the obvious guess that perhaps odd numbers were thought unlucky, which hardly seems sufficient or satisfactory. It was therefore my intention to discover, *first*, whether the intestines of a lamb could be examined in any way at all in which numbers of "convolutions" between 10 and 16 could be observed, thereby confirming the now-accepted reading of the term *tirānu*, and

1. Lutz, JAOS 38 (1918) 77.
2. Lutz, JAOS 38 (1918) 79.
3. Goetze, Old Babylonian Omen Texts, YOS 10, pp. 8-9, 11.
4. Starr, HUCA 45 (1974) 23.

secondly, whether any explanation could be found to account for the unfavorable omen implied by an odd number of convolutions.

Neither task presented an immediate or obvious solution. The small and large intestines of a lamb, which together form a voluminous and unwieldy mass of soft and undulating, wet and slippery material of light weight, are not easy to inspect. It is difficult to get hold of them, and too firm a pressure can result in malodorous consequences. They form an impediment to the examination of the liver and gall-bladder and are best removed and set aside so that the liver can be properly and carefully lifted out of the carcass without suffering damage.

When confronted initially with the vast mass of the intestines, one's first reaction is inevitably confusion and a feeling of hopelessness that any "convolutions" from the amorphous mass can possibly be observed with any meaning or rigor at all. The small intestines present a large number of convolutions—which, in the words of the anatomist Sisson[5] "form a sort of festoon"—but they slip and slide and have no permanence, and no number as low as 10 to 16 can possibly apply to them in any meaningful way. However, according to Hussey, *tirānu* applies specifically to "the large colon."[6] By this, Hussey evidently means that part of the large intestines known as the colon. So an attempt was then made to study the colon, which appeared hopeless as well, until I hit upon the expedient of spreading the intestines out as flat as possible over as great an extent as they would cover.

From a young lamb one thus gets a circular spread about two feet across, when laid out on a slab or table, after having been removed from the lamb. When this is done, that part of the large intestines, the colon, which is posterior to the caecum, naturally resolves itself within this mass into an extraordinary spiralling configuration which is very striking. Veterinarians whom I have consulted have told me that their term for this part of the intestines inside a farm animal is "the spiral colon." This configuration is dramatically shown in a projection of its three dimensional position in the body in a diagram of the colon of a pig in Sisson's Anatomy.[7] The spiralling pattern is actually a double-helix when seen in this way. From the caecum, the colon descends in what are called the centripetal coils until it reaches its lowest point, where it turns in a tight S-bend and spirals up again in what are called the centrifugal coils, and then leads off to the rectum. Nothing of this kind occurs in the human body: our colons simply rise, cross over, and descend to the rectum without forming a spiral configuration.

It is immediately obvious to anyone familiar with the well-known terra cotta Humbaba-mask of intestines in the British Museum (BM 116624)[8]

5. Septimus Sisson, The Anatomy of the Domestic Animals (4th ed.), p. 470.
6. JCS 2 (1948) 30.
7. Sisson Anatomy p. 493.
8. An excellent photo of this object may be seen in AAA 11 (1924) pl. 13.

that this natural spiralling pattern is the inspiration for it, though it might take the colons of two separate lambs to be arranged into an actual Humbaba-mask, which could probably be done. I have not undertaken this task, which would be exceedingly tedious and necessitate skilled cutting with a scalpel to free and uncoil the colon prior to rearranging it. Smith has pointed out that the Humbaba-mask is formed by "a long strip of clay, turned and twisted about in such a way as to represent all the important features."[9] In a later article, Smith reports another Humbaba-mask in the British Museum (BM 116737) and seems to have had second thoughts as to whether the twisting single line was actually laid on rather than moulded in some other way, but stresses that what distinguishes the Humbaba-face from the faces of all other demons is the single line.[10] And this single line is, of course, the intestinal tract. A perfect and straightforward ancient depiction of the spiral colon of a lamb may be seen on a small object (YBC 3000) which is shown by Van Buren.[11]

The spiral colon of the lamb, laid flat, forms not only a spiralling pattern, but one closely resembling the classic spiral maze. If one follows the path of the colon along, when one comes to the center, the colon turns and spirals out again the other way. It is to be suspected that at least part of the inspiration for spiralling maze patterns in a variety of separate cultures in antiquity must have come from the observation of the intestines of sacrificial animals. Many of the ancient representations of spiralling mazes from different cultures, such as the ancient British, are perfect representations of the spiral colons of lambs or pigs. It seems safe to assume that observations of the animal colons were extremely widespread and influenced art and religion in many parts of the world.

The "numerology" of the observations of the *tirānu* in the ancient extispicy texts of the Near East now comes to be immediately evident, and fully explained: If one imagines a diameter of the roughly circular spread of the spiral colon when laid flat, and counts the number of stretches of colon crossed in descending from the top to the bottom (disregarding entirely whether they "connect" with one another and are in fact only half a convolution each), the number will in the case of all healthy sheep be an even number. So far, since I was examining young lambs less than a year old, I have only encountered "counts" of either ten or twelve. But as lambs in ancient times would often have been slaughtered when older, and their colons would have been longer, presumably "counts" of 14 and 16 would be encountered in them. A "count" of 14 is found in the object shown by Van Buren.[12]

9. AAA 11 (1924) 107ff.
10. JRAS (1926) 440ff.
11. Van Buren, Clay Figurines, YOSR 16 (1930) fig. 274.
12. Van Buren, Clay Figurines fig. 274.

These facts confirm with remarkable precision the evidence of the ancient texts. We can thus be assured that the translation of *tīranu* as the large intestines is justified, though we should specify that it refers actually to the spiral colon without the caecum, and not "the large colon" as stated by Hussey,[13] who seems to have confused Goetze's clearer account to which she gives a reference. Goetze's translation as, simply, "colon," is more precise anatomically. *Surummum* is obviously the very posterior end of the colon which emerges from the spiral and becomes the rectum.[14]

However, the word "convolutions" is slightly misleading. The "count" was quite obviously of the number of stretches of colon crossed in a straight line, and it disregarded the connectivity of those stretches entirely. One cannot thus say with equanimity that it was specifically the convolutions which were being counted. What was being counted was the stretches of colon produced by or constituting the convolutions, which is a different thing. Strict precision thus suggests a very slight alteration in the translation. We would be quite safe in speaking of the ancient *tirānu* observations as being the counting of "the arcs of convolution of the intestines," so that we avoid the implication that each count was of an entire convolution, and thus represented some sort of circular or convoluted form which had a complete shape of its own.

Finally, we come to the omen value of the *tirānu* counts. It has been explained how the counts must in all normal cases yield an even number. But how can an odd number occasionally be produced? For we know that the colon must be continuous, and an animal could not live if the spiral were not intact. What sort of abnormality could possibly bring about an odd count in the spiral? It cannot have been too common an occurrence, but fortunately for the sake of this study, I have actually encountered an example, and can offer an explanation. One lamb which I examined showed internal signs of being seriously diseased. Its liver was pale, with a greyish cast, washed-out looking (this often indicates anaemia), and with various anatomical abnormalities. The *ubānu* (*processus pyramidalis*) was covered in white abscesses. The liver was also abnormally small. When the intestines were laid out flat for inspection, they too presented abnormalities which altered the count.

In order to explain this, it must be mentioned that the spiral colon is surrounded by and enmeshed in a good deal of whitish internal fat. Butchers call this "caul fat," and in the days when purified lard was still used for medicinal purposes as an ointment base, it was obtained from the corresponding fat in the pig, which was then called "the finest 'leaf' lard," so-called from the appearance of sections of the fat, which has a veined

13. Van Buren, Clay Figurines p. 30.
14. Van Buren, Clay Figurines p. 9.

structure like an autumn leaf held up to the light. This intestinal fat in lambs considerably obscures observations of the colon when it is fresh and warm from the body of the lamb. One reason why the *tirānu* observations may have been left until last in all the extispicy inspections by the ancients may be that from experience the priests must have learned that twenty minutes to half an hour after being spread out in the air, the intestinal "caul fat" of the lamb ceases to be such an obstacle to making a count of the *tirānu*. For the fat congeals and hardens to the consistency of lard after about that length of time and then, far from hampering a *tirānu*-count, it actually enhances it by making the colon stand out plainly in relief against it in terms of both color and texture. I have taken several photos demonstrating this. Prior to the congealing of this intestinal fat, no amount of probing and peering can yield an entirely reliable estimate of the count, for the colon cannot easily be made out in its outer coils. As Goetze has said, the order of inspection in extispicy "remained virtually unchanged through the centuries."[15] We see here that in the case of the *tirānu* at least, there was a good physical reason for always leaving it till last. And since it was the custom to do a second inspection of the extispicy victim, known as the *piqittum*, "check,"[16] by which time the intestinal fat would definitely have congealed, the earliest extispicy inspections must have been proved wrong in their *tirānu*-counts so frequently that very quickly the priests would have fallen into the habit of leaving the intestines spread out in the air until the end of their liver examinations to avoid the embarrassment of being found wrong during the *piqittum*, with its built-in advantage of a guaranteed period of exposure to the air and hence a congealing of the fat.

However, there is one case where even the congealing of the intestinal fat is not sufficient to make the colon quite plain for the count. This is in the case of a diseased lamb. The diseased lamb mentioned above had a section of its colon badly distended and swollen, and also discolored, so that it was quite white—just the color of the uncongealed intestinal fat. In the spiralling maze, this whole arc-section of an intestinal convolution was effectively obscured for these reasons. It was of course possible by following the course of the colon with my fingers to trace its full course, and realize that this obscured portion was an abnormality of appearance due to inflammation in the interior, presumably caused by enteritis. But there is no way this stretch of colon could legitimately be thought to qualify for the count of the *tirānu*, since it was all but invisible. And to the ancient priests, appearance was everything. The fact that the colon was anatomically intact and was not disconnected was not the point. The practice of extispicy was avowedly to study the *appearance* of the entrails. In the case of the diseased lamb, then, an odd count of the *tirānu* resulted,

15. Van Buren, Clay Figurines p. 4.
16. See Starr in Essays Finkelstein, Memoirs Conn. Acad. Arts and Sciences 19 (1977) 203.

for although anatomically there were 12 arcs of convolution present, to a visual inspection only 11 could really be seen. This bad omen fully confirms what we know of most abnormalities observed in extispicy: abnormal configurations and appearance of entrails resulting from disease were largely unfavorable. This makes sense, whether to an ancient or a modern. Disease itself is an evil, and hence its results must be bad omens, except in special cases. Veterinarians have assured me that animals may appear perfectly healthy on the outside, but examination of their entrails will reveal that they were often quite ill. To ancient man, this must have seemed a deep mystery, with profound implications. Modern man still seeks the answers to mysterious questions in the entrails of dead bodies: in autopsies. The medical aspect of ancient extispicy may have been underestimated by modern scholars, though Jastrow appreciated it from the point of view of anatomical knowledge.[17]

There is a very striking example in ancient Greek extispicy of an abnormality of the entrails being interpreted as a good omen rather than as a bad omen. But this abnormality was one of inheritance rather than of disease. Plutarch records in his Life of Aratus[18] the following incident: "Thus was the sign which the god had given him in the sacrifice brought to pass: for it is said that a short time before this, Aratus was offering sacrifice and that there appeared in the liver of the victim two gall bladders enclosed in one caul. The soothsayer explained this to portend that Aratus would shortly form an intimate friendship with his greatest enemy."[19] This actually came to pass.[20] This abnormality was a congenital freak of nature, rather than a product of disease, and therefore was not necessarily an unfavorable omen.

17. Jastrow, Trans. College Physicians of Philadelphia 29 (1907) 118ff.
18. In Plutarch's Lives 4 (trans. A. Stewart and G. Long; London, 1892).
19. Plutarch's Lives, Life of Aratus, 43.
20. See Jastrow in Studies in the History of Religions (ed. O. G. Lyon and G. F. Moore; 1912) p. 163.

NOTE TO THE ILLUSTRATIONS

The two photos of the intestines of lambs shown below were taken by me at the abattoir. It should, however, be noted that a photograph cannot give a full picture of the spiral colon for two reasons. For one, a photographic view is static: a diviner inspecting the spiral colon at this point would be manipulating the organ with his hands, in order to make stretches of the colon better visible. For another, the colon is not perfectly suited to lying absolutely flat; yet to photograph it, it is necessary to get it as flat as possible so that it will all be in focus (the focal plane is important as there is little depth of field). Consequently some compromises had to be made, and it was impossible to prevent some stretches of the colon from partially obscuring other stretches. The basic pattern, however, is quite clear.[1]

Figure 1 is a close-up view of the spiral colon of a healthy lamb, showing a "count" of ten. This spiral colon had been exposed to the air for some time, and the intestinal fat has congealed into little lumps of lard.

Figure 2 shows the spiral colon of an unhealthy lamb. In this larger-array photo the spiral colon is in the center, surrounded by a sea of intestinal fat and membranous tissue. To the left, top, and right are the myriads of coils of the small intestines. At the bottom the large, bulbous caecum can be seen. The fact that this photo is in black and white rather than in color obscures some of the differentiation in the appearance of the spiral colon. It can be seen clearly that there is one arc near the bottom, center, of the spiral colon which is grossly inflamed, and so very pale that it barely shows up at all. The outermost coil at bottom appears with the same paleness in the black and white photo. But in color there was a difference, and it was quite clear that the single inflamed region was washed out in the same color as the fat, whereas the outer coil at bottom had a greyer, pinker quality; its paleness is partly due to the fact that the outermost coil is always more obscured by fat and membranous tissue, as can be seen also in the close-up photo, Fig. 1. The spiral colon of the unhealthy lamb shown in Fig. 2 should have had a "count" of ten, but due to the one arc being inflamed and washed out, the "count" was only nine.

1. For a three-dimensional illustration of the spiral colon see Sisson, Anatomy of Domestic Animals[4] p. 493. The reader is also referred to Van Buren, Clay Figurines fig. 274, discussed by her on p. 221 as no. 1078: YBC 3000. This object, dated to about 600 B.C., was mentioned above; it shows a striking similarity to the photos of spiral colons, though the figurine shows a "count" of fourteen rather than ten.

Figure 1: Close-up view of the spiral colon of a healthy lamb. (Viewed from this angle, the "count" should be made along a horizontal cross-section.)

Figure 2: Spiral colon and surrounding area from an unhealthy lamb.