

THE EMBRYONIC DEVELOPMENT AND THE HUMAN BODY IN THE YĀJÑAVALKYA SMṚTI

MAMATA CHOUDHURY

National Institute of Sciences of India, History of Science, Ancient
Period (Unit II), 1 Park Street, Calcutta 16

(Received January 17, 1966; after revision February 20, 1967)

In the *Yājñavalkya Smṛti*, an ancient treatise of Hindu Law, there occurs a description of the development of the human body from its embryonic to the full-grown stage in all its parts. The date of composition of this law-book has not been definitely ascertained. Dates ranging from the second century B.C. to even the middle of the fourth century A.D. have been suggested by different authorities. After a more or less detailed description of embryonic development, Yājñavalkya mentions the six *dhātus* (primary substances), six constituent parts of the body, three hundred and sixty bones and the five organs of action and perception. While mentioning the vital parts of the body, Yājñavalkya gives more or less a detailed description of the whole human body. The number of veins, sinews, arteries, muscles and nerves and also the number of cavities throughout the whole body and also the quantity of the fluid in the body have been mentioned. Many of these are, however, strangely speculative.

Yājñavalkya Smṛti (to be called henceforward *YS*), although primarily a work on Hindu law, is of some importance to the history of Indian medicine in view of its interesting account of the development of the human body from its embryonic stage.

The date of work.—The work is of uncertain date, various dates ranging from—second century to + fourth century having been suggested by different scholars. This uncertainty has been due largely to references in the literature to several Yājñavalkyas living at different periods of time. Moreover, the appellation itself represents in all probability the title or surname of a class rather than the name of an individual. The *Taittirīya Brāhmaṇa* mentions one Yājñavalkya as a contemporary of Janaka and the name also appears in the *White Yajurveda*.¹ From the closer relationship of its materials with those of the *White Yajurveda*, it is possible to attribute the work to one belonging to the *White Yajurveda* school. In the *Smṛti*^{1(a)} itself, the author lays claims on the *Āraṇyaka*, stating that he received it from the sun,—a statement which was probably inserted to give it the authority of an illustrious sage of high antiquity, for, on grounds of internal evidence alone, the work can hardly admit of such an early date as that of the *Āraṇyaka*.

The posteriority of *YS* to *Manusmṛti* (second to + second century) is quite evident from its treatment and elaboration of almost all topics dealt with by

the latter and by its more systematic and concise character. Its relation to Kauṭilya is also of considerable importance, for it not only bears a close resemblance with, but gives clear evidence of borrowings from, the *Arthaśāstra* (—third century). At the same time it cannot be later than Nārada and Br̥haspati (not later than + 500) who manifestly exhibit a far greater advance in juristic principles. Jolly and Jacobi have tried to show Yājñavalkya's acquaintance with Greek astronomy as transmitted to India, but its references to the *nakṣatra* system headed by *Kṛttikās* and to other matters envisage a level of astronomy characteristic of the late *Brāhmaṇa* or the *Sūtra* period. From all this, all that can be said about the *YS* is that while its upper limit cannot be fixed its lower limit probably does not go beyond the third or the fourth century A.D.² According to Macdonell, the author lived in Mithila, capital of Vedeha (Tirhut).³ Its five old commentaries include one by Viśvarūpa (+ninth century) and another by Vijñāneśvara (+1100).

Embryology.—Yājñavalkya holds the view that the world is created out of the five elements (ether, wind, light, water and earth), each with one attribute more than that the preceding one possesses.⁴ The sun, gratified by the sacrificial fire, causes rain; from rain grows plant; from plant food is produced; from food in its liquid form semen arises.⁵ Conception occurs when, during the menstrual period (*striṇpumsayoge*), the pure (*viśuddha*) male semen and female blood are mixed together. Consciousness then appears in the zygote as the Lord in the form of sixth element⁶ takes over charge of the five (cf. *Suśruta*).^{8(a)} In the first month, the embryo assumes the form of a jelly (*saṅkle-dabhūta*) being submerged in the elements (*dhātuvimūrchitah*). In the second month, it becomes a fleshy mass or tumour-like form (*arbuda*). In the third month, it is endowed with limbs, organs and acquires the qualities of the five gross elements. Thereafter, in the fourth month, it begins to move⁷ and also steadiness of the limbs occurs. In the fifth month, blood appears in the embryo and in the sixth month, strength (*śāla*), colour (*varṇa*), nails (*nakha*) and hair (on the head) develop.⁸ In the seventh month, it is endowed with mind, vitality, pulse (*nāḍī*), sinews (*snāyū*) and arteries (*śīrā*). In the eighth month, skin (*tvak*), flesh (*māṃsa*) and memory (*smṛti*) develop and the foetus is endowed with vital breath (*oja*). A child born in the eighth month is therefore deprived of the vital breath (death).⁹ In the ninth or in the tenth month, the embryo, like an arrow, is forced out of the uterus through its cavity in extreme pain.¹⁰

The foregoing developmental stages of the human embryo have also been described in the *Garbha Upaniṣad*,¹¹ the *Caraka Saṃhitā*¹² and the *Suśruta Saṃhitā*.¹³ The first stage of foetal development has been assumed differently by different authorities and is given in greater details in the *Garbha Upaniṣad* and the *Suśruta Saṃhitā*. The *Garbha Upaniṣad* states that the embryo is endowed with life in the seventh month and is fully developed in

the eighth, whereas in the *YS* the foetus is endowed with vital breath (*oja*) in the eighth month. There is also some difference between *YS* and the *Suśruta Saṃhitā* regarding the development of the foetus. In the former consciousness appears in the fourth month, mind (*mana*) in the fifth and cognition (*buddhi*) in the sixth month, in the latter there is no such mention of the time of development of these faculties. The *YS*,¹⁴ like the *Suśruta Saṃhitā*,^{14(a)} however, asserts that the desire of the duplicated heart (the heart of the mother and the foetus) should be fulfilled, as its non-fulfilment during pregnancy proves injurious to the child. The *YS* and the *Caraka* closely agree with each other in their descriptions of the foetal development.

Dhātus.—The *YS* mentions about six *dhātus* (primary substances)¹⁵ of the body, e.g. blood, flesh, fat, bones, marrow and semen. The *Atharvaveda*^{15(a)} lists eight such *dhātus* called *cakras*. According to Sāyana, these eight *cakras* are blood, flesh, fat, ligaments, bone, marrow, seed and the strength or *ojas*. The *Garbha Upaniṣad*^{15(b)} and the *Suśruta Saṃhitā*^{15(c)} admit seven *dhātus* and exclude *oja*.

Osteology.—The *YS* enumerates three hundred and sixty bones¹⁶ in the human body constituted of six parts,¹⁷ e.g. two feet, two hands, the face and the body. The bone names, number and their modern equivalents are shown in Table I, where the corresponding names from the *Suśruta* and the *Caraka* are also indicated.

The *YS* gives the number of bones in the human body as three hundred and sixty. This number recurs in the *Caraka Saṃhitā*,^{17(a)} and in the *Viṣṇu Smṛti*.^{17(b)} This enumeration of the total number of bones, presumably connected with the Vedic year of 360 days, was formulated in the Vedic times, for the *Rgveda*,^{17(c)} the *Atharvaveda*,^{17(d)} *Gopatha Brāhmaṇa*,^{17(e)} *Śāṅkhāyana Śrauta Sūtra*,^{17(f)} and the *Mānava Śrauta Sūtra*,^{17(g)} among others, all uniformly give this number in connection with the bones of the human body. The important exception is the *Suśruta Saṃhitā*^{17(h)} which fixed the number of bones at three hundred. As to the number of bones in the different parts of the body, there is, however, disagreement amongst different authorities. In the *YS* and in the *Caraka Saṃhitā* we find the three terms *śalākā*, *sthāna*, *jatru* which correspond respectively to *Suśruta's* *tāla*, *kūrca* and *kaṅṭha nāḍī*. *Suśruta* omits from his list the thirty-two sockets of the teeth, but introduces two ear-bones (*karṇa*) and two eye-bones (*akṣi*).

Organs and vital parts.—The *YS* mentions the five organs of perception with their objects¹⁸ as follows: nose (with the power of smelling), eyes (the power of vision), tongue (the power of taste), skin (the power of touch), ear (the power of hearing). The five organs of action¹⁹ are enumerated as *hastau* (two hands), *pāyu* (the anus), *upastha* (the generative organ), *jihvā* (the tongue) and *pāda* (feet), and *mana* (mind) co-operates with both organs of perception and organs of action. Besides these five organs of perception and

TABLE I

Names and number of bones given in the Yājñavalkya Smṛti and their differences from those given in other ancient texts

Sr. No.	Yājñavalkya Smṛti		Modern equivalents	Name and/or number according to other ancient texts
	Name	Number		
1	<i>Akṣa</i>	2	Collar bones	<i>Akṣaka</i> (<i>Caraka</i> , <i>Suśruta</i>)
2	<i>Aṃsa-samudbhava</i>	2	Scapula or shoulder bones	<i>Aṃsa-phalaka</i> (<i>Caraka</i>)
3	<i>Aṅguli</i>	60	Phalanges of the toes and finger (56 only) or digital bones	<i>Pāṇipādāṅgulyāsthī</i> (<i>Caraka</i>); <i>aṅguli-parva</i> (<i>Viṣṇu-Smṛti</i>)
4	<i>Aratni</i>	4	Radius and ulna	
5	<i>Bhagāsthī</i>	1	Pubic bone or sacrum-cum-coccyx	
6	<i>Danta</i>	32	Teeth	
7	<i>Danta-sthalāni</i>	32	Sockets of the teeth	<i>Dantolūkhalu</i> (<i>Caraka</i>); <i>Danta-sūkṣma</i> (<i>Viṣṇu-Smṛti</i>)
8	<i>Grīvā</i>	15	Neck-bones	<i>Grīvāsthī</i> (<i>Caraka</i>); 9 (<i>Suśruta</i>)
9	<i>Gulpha</i>	4	Ankle bones or malleoli	
10	<i>Hanu</i>	1	Lower jaw-bone or chin	<i>Hanvāsthī</i> (<i>Caraka</i>); 2 (<i>Suśruta</i>)
11	<i>Hanu-mūla</i>	2	Attachment or building bones of the lower jaw	<i>Hanumūla-bandhana</i> (<i>Caraka</i>)
12	<i>Jaṅghā</i>	4	Tibia and fibula	8 (<i>Suśruta</i>)
13	<i>Jānu</i>	2	Knee-caps	4 (<i>Suśruta</i>)
14	<i>Jatru</i>	1	Cartilage of the wind pipe	<i>Kaṇṭha-nāḍī</i> , 4 (<i>Suśruta</i>)
15	<i>Kapola</i>	2	Elbow-pans	<i>Kapālaka</i> (<i>Caraka</i>); <i>Kurpara</i> (<i>Suśruta</i>)
16	(a) <i>Lalāṣa-akṣi-gaṇḍa</i>	3	Bones constituting brows, eyes and cheeks	<i>Nāsikā-gaṇḍa-kūṭalalāṣa</i> , 1 (<i>Caraka</i>); <i>Lalāṣākṣi-gaṇḍa</i> , 2 (<i>Suśruta</i>)
	(b) <i>Nāsā</i>	1	Nasal bone called <i>ghana</i>	
17	<i>Nakha</i>	20	Nails	
18	<i>Pārṣṇī</i>	2	Heel bones	<i>Pārṣṇyāsthī</i> (<i>Caraka</i>); 4 (<i>Suśruta</i>)
19	<i>Pārśvaka-sthālaka-ARBUDA</i>	72	Ribs with their sockets and tubercles	<i>Pārśva</i> (<i>Suśruta</i>)
20	<i>Prṣṭha</i>	45	Backbones or the vertebral column	<i>Prṣṭhagatāsthī</i> (<i>Caraka</i>)
21	<i>Salākā</i>	20	Long bones of the hands and feet	<i>Pāṇipādasalākā</i> (<i>Caraka</i>)
22	<i>Sāṅkhaka</i>	2	Temple bones	<i>Sāṅkhya</i> (<i>Caraka</i>); <i>Sāṅkha</i> (<i>Suśruta</i>)
23	<i>Sīraḥ-kapāla</i>	4	Cranial bones	<i>Sīras</i> , 6 (<i>Suśruta</i>)

TABLE I (concl'd.)

Names and number of bones given in the Yājñavalkya Smṛti and their differences from those given in other ancient texts—concl'd.

Sr. No.	Yājñavalkya Smṛti		Modern equivalents	Name and/or number according to other ancient texts
	Name	Number		
	Brought forward			
24	<i>Sihāna</i>	4	Bases of the long bones or those of the metacarpal and metatarsal bones	<i>Pāṇipāda-salākādhī-sihāna</i> (Caraka); <i>Kūrca</i> (Suśruta)
25	<i>S'roni-phalaka</i>	2	Hip-blades; pelvic bones (Os innominature)	<i>S'roni</i> ; 5 (Suśruta)
26	<i>Tālūṣaka</i>	2	Hard palate or palatal cavities	<i>Tāluka</i> (Caraka); <i>Tālu</i> , I (Suśruta)
27	<i>Uras</i>	17	Breast bones	<i>Urasāsthi</i> (Caraka); 8 (Suśruta)
28	<i>Ūru-phalaka</i>	2	Thigh bones	<i>Ūru-nalaka</i> (Caraka); 4 (Suśruta)
		360		

action, the *Viṣṇu Smṛti* ^{19(a)} mentions four more organs transcending the sense organ (*indriyātīta*), namely *mana* (mind), *buddhi* (intelligence), *ātma* (soul) and *avyakta* (that which is unmanifested).

The vital parts of the human body²⁰ are several and, in the course of their enumeration, the *YS* gives a more or less detailed description of the human body. These parts are listed in Table II.

Veins, sinews and arteries.—The information contained in *YS* as to the number of veins, sinews, arteries (or tubular vessels along with their branches and sub-branches), muscles and nerves²¹ is given in Table III.

The Indian medical texts are well known for their enumeration of such things as the number of hairs, the number of cavities in the body and the head, the bones of the hair and sweat-holes—a tedious and hopeless task if real counting was implied. In keeping with this tradition, Yājñavalkya gives the number of hairs on the head and other parts of the body as three lakhs, the pores of the hairs as fifty-four crores and the sweat-holes as sixty-seven and half lakhs (these are separated by air spaces). The number of vital parts (one hundred and seven) and the joints (two hundred) have also been mentioned.²² In the *Garbha Upaniṣad*,²³ the number of vital parts (*marma*) is given as seven hundred and that of joints (*sandhi*) as eight thousand. It appears that in many instances these indicate nothing more than a large number of figures, for these are purely speculative figures which cannot be verified even with modern and refined means of measurements and calculations.

TABLE II
Vital parts of the human body

Sr. No.	Name	Modern Equivalents	Sr. No.	Name	Modern Equivalents
1	<i>Akṣikūṭa</i>	The corners of the eyes	19	<i>Kṣudrāntra</i>	Small cavities of the heart
2	<i>Āmāśaya</i>	The stomach	20	<i>Lalāṭa</i>	Brows
3	<i>Aṃsa</i>	Shoulder	21	<i>Nābhi</i>	Navel
4	<i>Avahanana</i>	The lungs	22	<i>Oja</i>	The vital power
5	<i>Avāṭa</i>	The depressed parts of the body	23	<i>Oṣṭha</i>	The lips
6	<i>Bāhu</i>	The arms	24	<i>Pāda</i>	Feet
7	<i>Vasti</i>	The urethra	25	<i>Pāyū</i> or <i>guda</i>	The anus
8	<i>Dantaveṣṭa</i>	The teeth-gum	26	<i>Plīhā</i>	The gall-bladder
9	<i>Galaśuṇḍika</i>	The projections at the neck, the joint of the base of the chin and cheek	27	<i>Purīṣādhāna</i>	The rectum
10	<i>Grīvā</i>	Throat	28	<i>Saṣkuli</i>	The orifice of the ear
11	<i>Hṛdaya</i>	Heart	29	<i>Sonita</i>	Blood
12	<i>Janḡhoruṣu ca pīṇḍika</i>	The flattened flesh at the legs and the thighs	30	<i>Sphijav</i>	The buttocks
13	<i>Kakundar</i>	The cavities of the loins or the hollows of the loins	31	<i>Stana śleṣmasa- nḡhātaja</i>	The breasts produced by accumulated phlegm
14	<i>Kanīnika</i>	The pupils of the eyes	32	<i>Sihulāntra</i>	The larger intestine
15	<i>Karṇa</i>	The ear	33	<i>Sukra</i>	Semen
16	<i>Karṇapatraka</i>	The lobes of the ear	34	<i>Tālūṣaka</i>	The palate
17	<i>Kloma</i>	The spleen	35	<i>Udara</i>	Abdomen
18	<i>Koṣṭha</i>	The abdominal glands	36	<i>Upajihvā</i>	The urula
			37	<i>Vanḡkṣana</i>	The groins
			38	<i>Vapā</i>	Fat
			39	<i>Vasā</i>	Suet
			40	<i>Vṛkkaka</i>	The kidneys
			41	<i>Vṛṣana</i>	Testicle
			42	<i>Yakṛt</i>	The liver

Another interesting feature is a kind of quantitative estimation of the different *rasas* (fluid)²⁴ in the human body. Yājñavalkya's estimates are as follows :

Name	Quantity
<i>Rasa</i> (chyle)	9 <i>Añjali</i>
<i>Jala</i> (water)	10 „
<i>Purīṣa</i> (faeces)	7 „
<i>Rakta</i> (blood)	8 „
<i>Śleṣmā</i> (phlegm)	6 „

Name	Quantity
<i>Pitta</i> (bile)	5 <i>Añjali</i>
<i>Mūtra</i> (urine)	4 „
<i>Vasā</i> (fat)	3 „
<i>Meda</i> (marrow)	2 „
<i>Majjā</i> (the marrow of the bones, flesh and head)	1 „ (in bone and flesh)
	$\frac{1}{2}$ „ (in the head)
<i>Śleṣmaja</i> (the product of phlegm)	$\frac{1}{2}$ „
<i>Retas</i> (semen)	$\frac{1}{2}$ „

1 *Añjali* = 1 *Kuḍava* measured by a vessel as 3 *Angulis* long, 4 *Angulis* broad, and $1\frac{1}{2}$ *Anguli* deep.

TABLE III

Veins, sinews, arteries, muscles and nerves in the YS

Name	Number	Modern equivalents	References to other ancient texts
<i>S'irā</i>	700	Veins	<i>S'irā</i> or <i>hirā</i> —1,000; <i>Atharva-veda</i> ^{21(a)(i)} ; <i>Suśruta Saṃhitā</i> ^{21(b)}
<i>Snāyu</i>	900	Sinews	Same as in the <i>Garbha Upaniṣad</i> and <i>Suśruta</i>
<i>Dhamanī</i>	200	Arteries	100, <i>Atharvaveda</i> ; 24, <i>Suśruta Saṃhitā</i>
<i>Dhamanī</i>	2900956	Arteries known as tubular vessels in all together with their branches and sub-branches	
<i>Peśī</i>	500	Muscles	The same as in the <i>Suśruta Saṃhitā</i> 10800, <i>Gopatha Brāhmaṇa</i> ^{21(a)(ii)}
<i>Nāḍī</i>	72,000	Nerves or tubular organs of the body known as <i>hita</i> and <i>ahita</i> , spreading out from the heart	72 crores <i>Garbha Upaniṣad</i> and <i>Praśna Upaniṣad</i> ^{21(c)} 72,000, <i>Bṛhadārāṇyaka Upaniṣad</i> ^{21(d)}

The *Yājñavalkya Smṛti* is mainly a treatise on social politics or better a socio-religious text. The inclusion in such a text of a considerable body of embryological, anatomical and physiological materials incidentally reflects the awareness of the ancient Hindus of the importance of such matters in socio-politics or religious practices.

ACKNOWLEDGEMENTS

My grateful thanks are due to Prof. P. Rây and Sri S. N. Sen for their kind interest and many useful suggestions.

REFERENCES

- 1 Gharpure, J. R., *The Collection of Hindu Law Texts*, Vol. XXIX. A General introduction with special reference to the *Yājñavalkya Smṛti* and the *Mitākṣarā* (1944), p. 50.
- (a) ———— *The Collection of Hindu Law Texts*, Vol. II, Part V. *Yājñavalkya Smṛti* with *Mitākṣarā*, *Viromitrodāya* and *Dīpakalikā* (1940), Book III, Ch. IV, verse 110.
- 2 Kane, P. V., *History of Dharmasāstra*, Vol. I, pp. 183-187.
- 3 Macdonell, A., *History of Sanskrit Literature*, London, p. 429.
- 4 Gharpure, J. R., *The Collection of Hindu Law Texts*, Vol. II, Part V. *Yājñavalkya Smṛti* with *Mitākṣarā*, *Viromitrodāya* and *Dīpakalikā* (1940), Book III, Ch. IV., verse 70.
- 5 *Ibid.*, III, IV, 71.
- 6 *Ibid.*, III, IV, 72.
- (a) *Suśruta Saṃhitā*, edited by Madhusudan Gupta, 1835, Calcutta, *Sārīra Sthāna*, Ch. III.
- 7 *Yājñavalkya Smṛti*, III, IV, 75-76.
- 8 *Ibid.*, III, IV, 80.
- 9 *Ibid.*, III, IV, 81-82.
- 10 *Ibid.*, III, IV, 83.
- 11 K. Narayanasvami Aiyar, *Garbha Upaniṣad, Thirty Minor Upaniṣads*, Slokas 2-3, Madras (1914).
- 12 Priyadarājan Rây and Hirendra Nath Gupta., *Caraka Saṃhitā (a scientific synopsis)*, National Institute of Sciences of India, New Delhi, History of Sciences in India Publication, pp. 9-10.
- 13 *Suśruta Saṃhitā, Sārīra Sthāna*, Ch. V.
- 14 *Yājñavalkya Smṛti*, III, IV, 79.
- (a) *Suśruta Saṃhitā, Sārīra Sthāna*, Ch. V.
- 15 *Yājñavalkya Smṛti*, III, IV, 84.
- (a) *Atharvaveda*, X, II, XXXI, edited by Roth, R., and Whitney, D. W., Berlin Ferd Dummers Verlagabuchhandlung, 1885, Translated by Whitney, W. D., Harvard University (1905), Griffith, R.T.H., F.J. Lazarus, Benares (1916).
- (b) *Garbha Upaniṣad*, Sloka 7.
- (c) *Suśruta Saṃhitā, Sārīra Sthāna*, Ch. V.
- 16 *Ibid.*, III, IV, 84-90.
- 17 *Yājñavalkya Smṛti*, III, IV, 84.
- (a) *Caraka Saṃhitā*, p. 95.
- (b) *Viṣṇu Smṛti*, 66, 60, edited by Jullius Jolly, Chawkhamba Sanskrit Series, Varanasi.
- (c) *Ēgveḍa*, I, 164, 48, edited by Max Muller, London.
- (d) *Atharvaveda*, X. 8.4, X. 5.4.2.
- (e) *Gopatha Brāhmana*, edited by Dieke Gaastra, Leiden, E. J. Brill (1919).
- (f) *Sāṅkhāyana Śrauta Sūtra* (IV. 15. 11-20), edited by Alfred Hillebrandt (1888, 1889), I-III, translated by W. Caland, International Academy of Indian Culture.
- (g) *Mānava Śrauta Sūtra*, VIII. 2.2, edited by Jeannette M. Van Gelder, New Delhi, International Academy of Indian Culture (1962).
- (h) *Suśruta Saṃhitā, Sārīra Sthāna*, Ch. IV.
- 18 *Yājñavalkya Smṛti*, III, IV, 91.
- 19 *Ibid.*, III, IV, 92.
- (a) *Viṣṇu Smṛti*, 66, 93-96.
- 20 *Yājñavalkya Smṛti*, III, IV, 93-99.
- 21 *Ibid.*, III, IV, 100-101, 108.

- (a) (i) *Atharvaveda*, 1.17, 1-3.
 (ii) *Gopātha Brāhmaṇa*, 1.5.5.
 (b) *Suśruta Saṃhitā, Śārīra Sthāna*, Ch. V.
 (c) *Praśna Upaniṣad, Doṣopaniṣad*, edited by Pandits of Adyar Library under the Supervision of Prof. C. Kunhan Raja, III.6 (1935).
 (d) *Bṛhadāranyakopaniṣad*, edited by Roer, E. Royal Asiatic Society of Bengal, Calcutta, IV, 2.3 (1849).

²² *Yājñavalkya Smṛti*, III, IV, 102-104.

²³ *Garbha Upaniṣad*, Sloka 20.

²⁴ *Yājñavalkya Smṛti*, III, IV, 105-107.