

HUMAN ANATOMY ACCORDING TO THE *AGNI PURĀNA*

B. B. MISHRA

Government Sanskrit College, Ranchi

The *Agni Purāna*, an encyclopaedic work of about 10–11 centuries A.D., discusses, in course of its physiological deliberations, ideas on the development of human body, obstetrics, physiology and anatomy. It gives an account of the process of conception, monthwise development of the embryo and the factors responsible for the development of various organs of the human body. As per the constitution of the human body, the *Agni Purāna*, accepts the established view that it is made of five physical elements (*pañca-mahā-bhūta*) and deals with them. The *Purāna* follows the pattern laid down by Caraka and Suśruta and discusses cosmogony in relation to the earliest *Sāṅkhya* philosophy. Among other aspects dealt with are those relating to the seven *dhātus*, *kālas* and *āśayas* as well as the ten vital parts. The *Agni Purāna* seems to represent the non-medical version of early Indian views on osteology. A comparative account of the distribution of bones in human body according to modern views as well as *Agni Purāna*, Caraka and Suśruta has been given. The other physiological and surgical ideas of the *Agni Purāna* have also been discussed in relation to those of Caraka, Suśruta and Kāśyapa. It is pointed out that the compiler of the text no doubt borrows from the old texts but also adds a few more details which are of value to the understanding of the history of ancient thought concerning physiology and anatomy.

The *Agni Purāna*, a work of about tenth and eleventh centuries, is encyclopaedic in character,¹ and it includes sufficient material on human body. It discusses four types of dissolution, *nitya*, *naimittika*, *prākṛta* and *ātyantika*.² The last type of dissolution means the union of the soul with God through true knowledge, which leads to a proper understanding of the two types of spiritual affliction, physical as well as mental, and finally ends in aversion from temporal things.³ After death the soul transmigrates from one body to another. The highest aim of the soul is to get united with God and thus attain emancipation from both physical and mental troubles. This discussion leads on to a treatment of embryology, the composition and development of the human body, its anatomy, etc., and finally ends in the philosophical note that a man should realize that his body is nothing but a mass of impurities, excreta, etc.⁴ Thus in the course of philosophical deliberations we are introduced to ideas on the development of human body, obstetrics, physiology and anatomy, which are important for medical science. They help to reconstruct the early Indian views on human anatomy and physiology.

Embryology

Basing its views on the law-books of Manu and Yājñavalkya the *Agni Purāṇa* states that barring the earlier three days sixteen days after menstruation are suitable for conception.⁵ Copulation on even days, i.e. fourth, sixth, eighth, etc., results in the birth of a son while on odd days it leads to the birth of a daughter.

In its perfunctory treatment the *Agni Purāṇa* describes the process of conception, the monthwise development of the embryo, and the factors responsible for the development of the various organs of the human body. Conception occurs as sperm meets menstrual blood in the uterus. During the stage of pregnancy the embryo remains turned towards the back of the mother, the head above, hands folded on the forehead, with inclined body and on the

TABLE I

Monthwise development of the foetus according to ancient Indian texts

Month	Caraka	Suśruta	Vāgbhaṭa	<i>Viṣṇudharmotara</i>	<i>Agni Purāṇa</i>
1	small mass	small mass	small mass	small mass	small mass
2	is solidified	is solidified	is solidified	is solidified	is solidified
3	appearance of all organs and limbs of the body	appearance of hand, feet, head and five tubercles and their fine development	appearance of five limbs	appearance of all limbs	appearance of limbs
4	embryo gets fixed	limbs well marked	limbs well marked	-	formation of bones
5	increase in flesh and blood	mind becomes alert	consciousness is produced	formation of skin	formation of skin and flesh
6	increase in flesh and blood	development of intelligence and sensitiveness	formation of blood-vessels, arteries, hair-follicles, skin	appearance of hair-follicles	appearance of hair-follicles
7	-	limbs well marked	all limbs and senses fully developed	intelligence	feeling of pain
8)	-	-	-	moves hither and thither by force of wind	moves hither and thither by force of wind
9)	-	-	-		

TABLE II
*Modern conception of the development of the foetus*⁸

Month	Development
1	Head and tail folds completed, cerebral as well as the optic vesicles easily recognized, appearance of auditory vesicles, face unrecognizable.
2	Formation of upper lip, nostrils directed forwards, palate not completely developed, eyelids present, external genitalia present and may show sexual differences, fingers and toes can be recognized, crown-rump length 30 mm.
3	Head extended, neck lengthened, limbs well developed, nails appear on the digits, crown-rump length 10 cm.
4	Lanugo appears on the body, total length including leg 22 cm.
5	First movement of the foetus is observed, eruption of hair on the head commences, vernix caseosa begins to be deposited, total length 30 cm.
6	Deposit of vernix caseosa considerable, papillae of the skin developed, free borders of the nails project from the corium of the dermis, total length 33 cm, weight 1 kilogram.
7	Pupillary membrane atrophies, eyelids open, testis descends, skin red and wrinkled, total length 40 cm, weight 1.5 kilograms.
8	Skin entirely coated with vernix caseosa and lanugo begins to disappear, foetus presents a plump appearance, total length 45 cm, weight 2 to 2.5 kilograms.
9	Lanugo largely disappeared from the trunk, umbilicus almost in the middle of the body and testis are in the scrotum, total length 50 cm and weight 3 to 3.5 kilograms.

right side (of the mother) if it is male, on the left if female and in the middle if it is impotent.⁶ The foetus, according to the *Agni Purāṇa*, remains a small mass in the first month, is solidified in the second, attains different limbs in the third, bones in the fourth, skin and flesh in the fifth, hair-follicles in the sixth and is endowed with consciousness of pain in the seventh and moves hither and thither by force of wind in the eighth and ninth months. Though the whole description is based on the *Viṣṇudharmottara Purāṇa*,⁷ comparative charts of the monthwise progress of the foetus, as given below, are of much use to us. The first chart shows that the *Agni Purāṇa* is indebted to the *Viṣṇudharmottara Purāṇa*, the only difference being the latter's silence over the progress of the foetus in the fourth month. Secondly, we find that classical medical texts do not throw any light when bones, hair-follicles, skin, etc., appear but the *Agni Purāṇa*, the *Viṣṇudharmottara* and *Vāgbhaṭṭa* do. Thirdly, none of the ancient Indian writers describe the length and weight of the foetus in different months. Above all we see that the knowledge of embryology acquired in ancient India was rudimentary.

As for the molecular constitution of the human body the *Agni Purāṇa* accepts the old view that it is made of five physical elements (*pañcamahā-bhūta*), ether, wind, water, fire and earth. It adds that the ether makes the ears and different other outlets (*śrota*) and helps to produce sound; the wind

produces respiration and expiration, touch organs and provides motor power; the fire is represented in the body by colour, heat, bile, memory, strength, brilliance and bravery; water contributes tongue and taste, perspiration, fat, chyle, blood, semen, urine and phlegm; and smell, hair, hair-follicles, nails and head are due to earth.⁹

From the mother the foetus inherits soft parts of the body as skin, flesh, heart, navel, marrow of the bone, fat, intestines, etc., and from the father are created blood-vessels, nerves, semen, etc.; and from self senses of love, anger, fear, pleasure, righteousness, etc.¹⁰ But the *Agni Purāṇa* does not describe the other three factors responsible for the full growth of human body, those born from chyle, *sattva* and *sātmya* are not referred to by it as is done by the three classical writers, Caraka, Suśruta and Vāgbhaṭṭa.¹¹

The *Purāṇa* further informs us that spleen and liver are created by the chyle, lungs from the foam of the blood, and the stomach (*uṇḍuka*)¹² from blood and bile or residue of blood. Fat and blood make the kidneys; blood and flesh intestines; blood and wind sensual propensity; and blood and phlegm create the blooming lotus-like heart. Flesh, blood and phlegm create tongue while fat, blood, phlegm and flesh make the scrotum and testicles.¹³ The *Agni Purāṇa* treats the heart as the centre of sensory and pre-sensory organs or, in other words, the centre of the autonomic nervous system, an idea though current in early India is untenable these days.

As regards the position of different internal organs of the body it rightly places spleen on the left and liver on the right side. The lung (*kloma*) is placed on the right side of the heart and is said to be the centre of both blood as well as lymphatic-vessels, which make possible the existence of different organs of the body.¹⁴ This view of the *Agni Purāṇa* is different from Suśruta, and in this respect it makes a welcome departure.

Physiology

The *Agni Purāṇa* follows the pattern laid down by Caraka and Suśruta and discusses the cosmogony of the universe. Like them it is based on the earliest *Sāṅkhya* philosophy. The human body here is said to be the result of twenty-four basic elements besides the vital life called *jīva* or *puruṣa*. In this connection five sense-organs, five work-organs, five great physical elements, five objects of sense (*indriyārtha*) and mind are counted. But the picture is left incomplete in the absence of *prakṛti*, *mahāna* and *aḥamkāra*. The *puruṣa* possesses the three vital qualities, *satva*, *rājas* and *tāmas*, even in his unmanifest form. The *Sāṅkhya* philosophy depicted in the *Agni Purāṇa* is as rudimentary as in the days of Caraka and Kaśyapa because it neither refers to the twenty-five elements nor to the five subtle elements (*tanmātrā*). Instead it considers the five objects of sense in place of subtle elements as the basic elements, as is done by Kaśyapa and Caraka.¹⁵ Moreover, the *Purāṇa* unlike

Suśruta does not attempt at differentiation between the *puruṣa* and the *karmapurūṣa*, who is the proper subject for medical study.¹⁶ This may be attributed to the preoccupation of the *Agni Purāna* with the philosophical discussion of creation and dissolution of the creation according to the *Sāṅkhya* school and the eightfold *Yoga*.

The human body, a mass of impurities, excreta, etc., is also helped in its creation by the three qualities, *satva*, *rājas* and *tāmas*. Pride, laziness, hunger and thirst, likes and dislikes, anxiety and fear are caused by the last quality; sensual tendencies, anger, bravery, desire for the performance of religious sacrifices, oration, self-ego and not acting according to the dictates of others stem from *rājas* quality while the *sātvika* one creates the desire for righteousness, salvation, devotion to God, gift and love for one's avocations.¹⁷

According to the *Agni Purāna* chyle and blood constitute the life or health, blood nourishes the flesh, the fat feeds the adipose tissues, bones uphold the bodily frame, the marrow of the bones increases semen, which increases virility and strength and the *ojas* is life-sustaining and the abode of life. It adds that the *oja* is the core of seminal fluid and remains in the heart.¹⁸ *Oja* is variously identified as prostate gland secretion, glycogen or albumin and bodily vigour. Further the *Agni Purāna* accepts the view of Kaśyapa and Caraka regarding the proportion of seven *dhātus* in a human body. It states that bone-marrow is one handful, fat two handfuls, serum of the flesh three handfuls, urine four handfuls, bile five handfuls, lymph six handfuls, faeces seven handfuls, blood eight handfuls, chyle nine handfuls, water ten handfuls, semen half handful and *oja* one-fourth handful. The ratio is as propounded by the Ātreya school, which fixes the measurement of *oja* at half handful and adds brain of equal weight to the list. However, our *Purāna*, together with the *Viṣṇudharmottara*, seems to be the first to point out the weight of menstrual blood as four handfuls.¹⁹ The ratio of these vital elements of the human body described by all these early Indian texts are but fanciful conjectures.

Human anatomy

The views of the *Agni Purāna* on the subject are very precise in the form of aphorisms. The human body is divided into six branches, two legs, two hands, trunk and the portion above the neck. The sixfold division of the skin as propagated by the Ātreya school is accepted by the *Purāna* instead of the better view of Suśruta, who conforms to the modern view that there are seven layers of skin. The outer skin mentioned in the *Agni Purāna* is called water-carrying (*udakadharā*) by Caraka; the second carries blood; the third is the birthplace of *kilāsa*, a type of leprosy; the fourth is fit for leprosy; the fifth is fit for tumors (*vidradhi*) and *alji*; and the sixth carries the vitality of life.²⁰

The *Agni Purāṇa* also describes the seven *kalās*, which are to be identified as the dividing layer between the seven *dhātus* on the one hand and their seven reservoirs on the other. Thus they are *māṃsadharā*, *raktadharā*, *medodharā*, *śleṣmadharā*, *purīṣadharā*, *pittadharā* and *śukradharā*. They are identified as deep fascia (intermuscular septa), endothelial lining of the blood-vessels and sinuses in the liver and spleen, omentum-deep fascia, synovial membrane, mucous membrane of the colon and rectum, mucous membrane of the small intestine and mucous membrane of the vesiculae seminalis, vas deferentia.²¹

And so there are seven reservoirs (*āśaya*) in a man and eight including uterus in a woman. These reservoirs comprise blood, lymph, bile, urine and wind. The other two are *āmāsaya* and *pakvāsaya*. Some of them can be identified, *pakvāsaya* with large intestine, *āmāsaya* with small intestine, *pittāsaya* with urinary bladder, *raktāsaya* with liver and spleen and the *vātāsaya* with lungs. The *Purāṇa* further adds that kidneys, lungs, liver and spleen, coecum and other reservoirs are interconnected.²² The measurement of human intestines by the *Agni Purāṇa* is similar to that mentioned by Suśruta who says that a man's intestine measures three and a half *vyāmas* and that of a woman three *vyāmas*. One *vyāma* comes to seven feet. So the male and female intestine measure twenty-four and a half feet and twenty-one feet respectively. Modern physiologists have worked out the average length of the human intestine as twenty-two and a half feet for small intestine and five feet for large intestine. The discrepancy between the old and the recent view is not much, but a woman is now supposed to possess at least one foot longer intestine than a man. So the view that a woman has a somewhat smaller intestine is wrong.²³

The ten vital parts (*prāṇāyatana*) according to our text are neck, heart, navel, wind-pipe, tongue, semen, blood, anus or pelvis, kidneys and ankle (*gulpha*). The list is a little different than the list of Caraka and Vāgbhaṭṭa.²⁴ The first replaces tongue and ankle by flesh and *oja* while the second takes *oja* in place of ankle. Perhaps Vāgbhaṭṭa is the first followed by the *Viṣṇu-dharmottara*, who considers the root of the tongue as one of the vital parts. The *Agni Purāṇa* follows both, but it briefly describes palate. No doubt the root of the tongue is to be considered an important and vulnerable part of the body. Kāśyapa regards the root of the palate (*tālumūla*) as the centre of all the nerves (*dhamanīs*).²⁵ None of us can bear a blow on it as wind-pipe together with some important nerves as trigeminal, fascial, glasso pharyngeal and pneumogastric nerves pass through it.

Osteology

The *Agni Purāṇa* represents the non-medical version of early Indian views on osteology.²⁶ Like Kāśyapa, Caraka and earlier *Smṛti* literature, it states that a human body contains three hundred and sixty bones while the surgical school represented by Suśruta holds them to be three hundred leaving

aside sockets of teeth and nails. It seems that the compiler of the *Agni Purāna* knew the charges levelled by Suśruta at the earlier view on human anatomy and states that the Vedic school holds this view.²⁷ However, he accepts the views of the Vedic school perhaps on account of the close affinity of the *Purānas* with the *Vedas*. He repeats the mistakes committed by the *Smṛti* literature together with Kaśyapa and Caraka and counts the thirty-two sockets of teeth as bone when even the thirty-two teeth most commonly regarded as bone are today taken as only cartilaginous growth. The actual number of ribs is twenty-four against seventy-two held by both medical as well as non-medical Hindu writers. Discrepancies also occur in the enumeration of phalanges, vertebrae, vertebrae cervix, carpal and tarsal bones. Bones as humerus, sacrum, coccyx, vomer, lachrimal, hyoid, inferior turbinated, malleus, incus and stapes and breast bones have been completely left out. We find that ancient Indian writers on human anatomy always erred in distinguishing the short bones and the ossified cartilaginous growth as in carpal and tarsal region, pelvis, elbow pans, vertebrae, etc. However, a comparative table and study of osteology given below will be of much help to us in understanding the growth of knowledge on osteology as well as the contribution and deficiency of the *Agni Purāna* in the field.

TABLE III
Distribution of bones in human body

Names of bones	Modern ²⁸	<i>Agni Purāna</i>	Caraka	Suśruta
Teeth ..	.. ×	32	32	32
Sockets of teeth ..	.. ×	32	32	×
Nails ..	.. ×	20	20	×
Phalanges ..	.. 56	60	60	60
Metacarpal and metatarsal	20	20	20	20
Radius and ulna ..	.. 4	4	4	4
Tibia and fibula ..	.. 4	4	4	4
Patella ..	.. 2	2	2	2
Elbow pans ..	.. ×	2	2	×
Femur ..	.. 2	2	2	2
Humerus ..	.. 2	×	2	2
Collar-bone ..	.. 2	2	2	2
Shoulder-blade ..	.. 2	2	2	2
Breast-bone ..	.. 1	17	17	8
Vertebrae (spinal) ..	.. 17	45	35	30
Vertebrae cervix ..	.. 7	15	15	9
Trachea and bronchi ..	.. ×	1	1	4
Pelvis				
sacrum ..	.. 1	×	1	1
coccyx ..	.. 1	×	1	1
ilium, ischium ..	.. ×	2	2	2
pubis ..	.. 2	1	1	1

TABLE III—concl'd.

Names of bones	Modern ^{2a}	<i>Agni Purāna</i>	Caraka	Suśruta
Olecranon (<i>kūrpara</i>) ..	×	×	2	2
Elbow process				
Oscalcis or heel ..	2*	2	2	2
Cranium				
frontal ..	1	} = 6	2+4 = 6	2+4 = 6
parietal ..	2			
occipital ..	1			
sphenoid ..	1			
ethmoid ..	1			
Os. temporale ..	2	2	2	2
Superior maxillary ..	2	2	2	2
Inferior maxillary ..	1	1		
Ossa faciei (nasal) ..	2	1	3	3
Vomer ..	1	×	×	×
Palate ..	2	2	2	1
Lachrymal ..	2	×	×	×
Inferior turbinated ..	2	×	×	×
Molar ..	2	2	×	2
Hyoid ..	1	(included in <i>grīvā</i>)	—	—
Ribs ..	24	72	72	72
Carpal bones ..	16	4	10	10
Tarsal bones ..	14	4+2* = 6	10	10
Ossicles of the ear				
malleus ..	2	} = 6	×	×
incus ..	2			
stapes ..	2			
Total ..	206	361	360	300

* Included in tarsal bones.

The chart shows that the *Agni Purāna* actually counts three hundred and sixty-one instead of three hundred and sixty bones and rightly enumerates three maxillary bones instead of two as done by Caraka and Suśruta and leaves out the styloid processes of the wrist. Suśruta counts thirty as the dorsal and the lumbar vertebrae and nine vertebrae cervix as against Caraka's thirty-five and fifteen respectively. The *Agni Purāna* enhances them to forty-five and fifteen as against modern seventeen and seven respectively. It enumerates the cervical vertebrae as the neck bones adding to them the hyoid bone also. Caraka and the *Agni Purāna* refer to one bone in the wind-pipe as against four by Suśruta. Actually there is no bone in this region, but the four cartilages of the trachea and bronchi region, cuneiform, arytenoid, thyroid and cricoid. This discussion leads us to the conclusion

that the knowledge of osteology was fairly advanced in ancient India but the scholars preoccupied themselves with human skeleton, i.e. the stuff which remains after the softer tissues of the body have been disintegrated or removed and thus includes not only the bones, but the cartilages and ligaments too.²⁹ Our view is corroborated by the *Agni Purāna* that seventy-two ribs include their sockets as well as their tubercles (*arbuda*).³⁰ The mistake in counting bones and properly distinguishing them from cartilages may be attributed to the injunction of the Hindu scriptures to cremate the dead bodies of those above two years and the taboo attached to the touching of human corpse. The dead bodies were left to decompose and washed in a rivulet or stream. Thus, on the one hand, tender and not fully grown bones of the child were washed away and, on the other, ossified cartilages defied the slow moving water.

Arthrology

Passing on to arthrology, our *Purāna* like Suśruta enumerates two hundred and ten joints of the bones as against three hundred and eighty-one by Kaśyapa, two hundred by Caraka and states that sixty-eight are in the four extremities, fifty-nine in the trunk and eighty-three above the shoulder.³¹ It, however, neither locates them in different parts of the body nor gives their eightfold division of Suśruta.

Myology

In the field of myology the *Agni Purāna* describes five hundred muscles (*peśis*) as against four hundred by Kaśyapa and Caraka,³² forty above shoulder, four hundred in the four extremities and sixty in the trunk. However, it adds that a woman possesses twenty-four muscles more than a man,³³ ten in the two mammae, thirteen in the vagina and four in the uterus. Thus it actually counts twenty-seven instead of twenty-four. Suśruta, on the other hand, says that woman has twenty more muscles. As the compiler of the *Agni Purāna* does not locate the different muscles in the body it is difficult to evaluate his views.

Like Suśruta, the *Agni Purāna* enumerates four tendons (*māmsarajju*), two anterior and two posterior, meant for holding the muscles. They are identified with longissimus-spinalis and ilio-costalis.³⁴ It adds that there are sixteen *kaṇḍarās*, two in each foot, tendo achilis in the leg and semimarbransus tendon in the thigh; two in each arm, supinator longus tendon in the forearm, and the semilunar or biceptial fascia tendon in the arm; four in the neck, sterno-cleidomastoid tendon, membrana tectoria, membrana atlanto-occipitalis posterior, lig. cruciatam atlantis with crus superius and inferius; four in the spinal column, lig. longitudinale anterius, lig. longitudinale posterius,

lig. flavum and lig. supraspinale.³⁵ As against this view Kaśyapa holds that there are only fourteen tendons.

The *Agni Purāṇa* alludes to seven sutures (*sivanyas*), five in the head and one each in penis and tongue. Though it follows Suśruta it does not divide them into two categories, raphe or ridge and sutures, as is done today. There are actually two raphes in the anus and penis region, raphe of the scrotum and ano-coccygeal raphe, while the ridge of the palate is called frenulum lingoe. Suśruta and the *Agni Purāṇa* count only such sutures as are apparent on the roof of the human skull and are actually five no doubt, but many more are hidden. The five apparent sutures of the skull are metopic, coronal, lambdoid, saggital and temporal.³⁶

Lastly, our *Purāṇa* speaks of the sixteen perforations (*jālas*), four each in flesh, ligament tendons (*śnāyus*), vascular system (*śirās*) and bones, and tells that they are all attached to one another in the wrist and the ankles.³⁷

Further the *Agni Purāṇa* adds that nine hundred ligament tendons (*śnāyus*) run all over the body, two hundred and thirty in the trunk, seventy above the shoulder and six hundred in the four extremities. The joints of the ligament tendons and tubular vessels, etc. (*kūrchā*), are said to be six, two in the arm, two in the leg, and one each in neck and penis. This view accords with Suśruta but not with Kaśyapa who takes them to be forty-two.³⁸ Our *Purāṇa* also does not differentiate between tubular vessels, arteries and capillaries.

Vascular System

The *Agni Purāṇa* does not describe the blood circulation system but it follows Kaśyapa and Caraka and refers to seven hundred tubular vessels (*śirās*) and two hundred arteries (*dhamanīs*). The difference between *śirās* and *dhamanīs* is elaborated by Kaśyapa, who opines that *śirās* emanate from the heart and the *dhamanīs* from the root of the palate or the meningeal membrane (*tālumūla*).³⁹ Suśruta, however, holds that navel is the root of *śirās*. Thus according to him they stand for blood as well as lymphatic vessels. This view may be true in the case of a foetus but not for a child. After birth the heart becomes the centre of the blood-vessels. *Dhamanīs* according to Kaśyapa seem to be the cerebral nervous system. The compiler of the *Agni Purāṇa* not at all treats the difficult and controversial vascular system. The *Purāṇa* further adds that there are 3,050,900 tubular vessels in the body.⁴⁰ However, there is some confusion in the transcription by the compiler, which crept into it long before Gaṅgādhara, the celebrated scholar from Orissa, who edited the compendium of Caraka. Gaṅgādhara says that there are nine hundred tubular vessels (*śirās*) and arteries (*dhamanīs*) branching into three lakh capillaries. Caraka originally takes them to be only 30,956 and adds that hair-follicles are in same number. The *Agni Purāṇa* differing from

Caraka says that there are seventy-two crores of hair-follicles.⁴¹ The number of hair-follicles is nothing but conjectural and to make the picture of human anatomy complete. None of us today will like to take the trouble of counting them and more so working out the average.

So we may conclude that the *Agni Purāṇa*, a compilation of the early medieval period, discusses human physiology, embryology and anatomy on the basis of old *Sāṅkhya* literature together with the three classical medical texts of Caraka, Suśruta and Vāgbhaṭṭa. It does create occasional confusion, but on the whole it presents a complete picture. The compiler of the texts no doubt borrows from older texts but also adds a few things which are of value for the history of ancient Indian thought on physiology and anatomy.

REFERENCES

- ¹ Mishra, B. B., *Polity in the Agni Purāṇa*, Cal., 1965, p. 204.
- ² *Agni*, Ānandāśrama Sanskrit Series, Chs. 368-9.
- ³ *Ibid.*, 368, 2 and 369, 1-2.
- ⁴ *Ibid.*, 370, 43; cf. *Viṣṇudharmottara*, II. 56.45
- ⁵ *Ibid.*, 153, 1-2; *VDP*, II. 85.2-3; *Manu*, 3.46; *Yājñ.*, 1.79; *Suś. Sārīra.*, 2.28-30, 3.6; *Aṣṭāṅga-saṃgraha Sārīra.*, 1.199; *Aṣṭāṅgaḥṛdaya*, II. 1.27 ff.
- ⁶ *Ibid.*, 369, 21-22; *VDP*, II. 114.6-7.
- ⁷ *Ibid.*, 369, 19-24; *VDP*, II. 114.1-4; cf. *Suśruta. Sārīra.*, 3.18.
- ⁸ Grey, *Anatomy*, 1949, pp. 208-211.
- ⁹ *Agni*, 369, 28-31.
- ¹⁰ *Ibid.*, 369, 31-33.
- ¹¹ *Ibid.*, 369, 31-33; *Caraka Sārīra.*, 3.12-18; *Suśruta. Sārīra.*, 3.43; *Aṣṭāṅgaḥṛdaya Sārīra.*, 3.4-6.
- ¹² *tanḍaka* should be properly read as *uṇḍuka*.
- ¹³ *Ibid.*, 370, 12-16 and 21.
- ¹⁴ *Ibid.*, 370, 17-19.
- ¹⁵ *Ibid.*, 370, 3; *Kāśyapa Sārīra.*, p. 45; *Caraka Sūtra.*, 8.10.
- ¹⁶ *Suśruta. Sārīra.*, 1.17.
- ¹⁷ *Agni*, 369, 34-37; *VDP*, II. 115.16-18.
- ¹⁸ *Ibid.*, 369, 40-42; cf. *Suśruta. Sūtra.*, 15.6.
- ¹⁹ *Ibid.*, 370, 40-43; *Kāśyapa Sārīra.*, pp. 51-52; *Caraka Sārīra.*, 7.16.
- ²⁰ *Ibid.*, 369, 42-44; *Caraka Sārīra.*, 7.2; cf. *Suśruta. Sārīra.*, 4.3.
- ²¹ *Ibid.*, 369, 44-45; cf. Ghanekar on *Suśruta. Sārīra.*, 4.4-22.
- ²² *Ibid.*, 370, 11.
- ²³ *Ibid.*, 370, 14-15 and Ghanekar on *Suśruta. Sārīra.*, 5.8.
- ²⁴ *Ibid.*, 370, 21-22; *Kāśyapa Sārīra.*, p. 45; *Caraka Sārīra.*, 7.11; *Aṣṭāṅgasamgraha Sārīra.*, 3.13.
- ²⁵ *Ibid.*, 370, 21-22; cf. *VDP*, II. 115.69-70 and *Aṣṭāṅgasamgraha Sārīra.*, 3.3; *Kāśyapa Sārīra.*, p. 45.
- ²⁶ *Ibid.*, 370, 27-32. For detail see A. F. Rudolf Hoernlé, *Studies in the Medicine of Ancient India*, I, Oxford, 1907.
- ²⁷ *Ibid.*, 370, 15.
- ²⁸ Chakraberty, C., *Ancient Hindu Medicine*, Cal., 1923, pp. 6-11; Dorland's *Pocket Medical Dictionary*, 20th ed., 1967, B-15-20.
- ²⁹ Cunningham, *Anatomy*, p. 67; Chakraberty, C., *Ancient Hindu Medicine*, p. 16.
- ³⁰ *Agni*, 370, 32—*Parśukāstūlukaiḥ sārḍhamarbudaiścha dvisaptatiḥ*.
- ³¹ *Ibid.*, 370, 33; *Suśruta. Sārīra.*, 5.26-29; *Caraka Sārīra.*, 7.15; *Kāśyapa Sārīra.*, p. 45.
- ³² *Ibid.*, 370, 36-38, *Kāśyapa Sārīra.*, p. 45, *Caraka Sārīra.*, 7.15; *Suśruta. Sārīra.*, 5.5, states 400 muscles in extremities, 66 in trunk and 34 muscles above shoulder. Cf. *VDP*, II. 115.86-87.

- ³³ *Agni*, 370, 37-38; *VDP*, II. 115.88-89; *Suśruta. Sārira.*, 5.50.
³⁴ *Ibid.*, 370, 26; *Suśruta. Sārira.*, 5.13.
³⁵ *Ibid.*, 370, 23-24; *Suśruta. Sārira.*, 5.10; *Kāśyapa Sārira.*, p. 45, Chakraberty, C., *Ancient Hindu Medicine*, p. 29.
³⁶ *Ibid.*, 370, 27; *Suśruta. Sārira.*, 5.14; *Suśrutasamhitā Sārīrasthāna*, ed., Ghanekar, Varanasi, 1950, pp. 145-6.
³⁷ *Ibid.*, 370, 23-24; *Suśruta. Sārira.*, 5.11.
³⁸ *Ibid.*, 370, 25; *Suśruta. Sārira.*, 5.12; *Kāśyapa Sārira.*, p. 45.
³⁹ *Kāśyapa Sārira.*, p. 45—*Sapta śīrāśatāni hr̥dayamūlāni . . . dve dhamanīdate tālumūle.*
⁴⁰ *Agni*, 370, 38-40; *Suśruta. Sārira.*, 7.2; *Caraka Sārira.*, 7.15.
⁴¹ *Ibid.*, 370, 40; *Caraka Sārira.*, 7.15.