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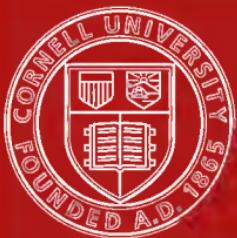
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The surgical instruments of the Hinduswi



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THE
**SURGICAL INSTRUMENTS
OF THE HINDUS**

WITH

**A Comparative Study of the Surgical Instruments of
the Greek, Roman, Arab and the Modern
European Surgeons.**

BY

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TO
THE HON'BLE
SIR ASUTOSH MUKHOPADHYAY, Kt.,

Saraswati, Sastra-vachaspati,

C.S.I., M.A., D.L., D.Sc., F.R.A.S., F.R.S.E., F.A.S.B.,

**Judge of the High Court of Judicature at Fort William
in Bengal,**

VICE-CHANCELLOR, CALCUTTA UNIVERSITY,

Ex-President of the Asiatic Society of Bengal,

AND

Chairman of the Board of Sanskrit Studies,

**In recognition of his love of Science, his pre-eminent services to the cause
of University Education, his administrative ability, and his generous
liberality to scholars**

AS WELL AS

In grateful remembrance of many acts of kindness,

THIS VOLUME IS

DEDICATED

BY

THE AUTHOR

P R E F A C E .



For researches into the state of medicine among the Ancient Hindus, we have several sources of information to scrutinise. The remarks of Dr. Payne regarding the sources of information of Anglo-Saxon Medicine may apply here with still greater force.¹

• First is, the evidence of contemporary literature about the craft of physicians and surgeons, since we are sure that there has always been a class of medicine men of one kind or another. Thus we find in the Rgveda, the use of artificial limb as substitute for a limb accidentally lost². From the Mahābhārata:

¹ Payne's English Medicine in the Anglo-Saxon Times, P. 7.

² चरित्रं हि वेरिवाच्छेदि पर्णम्

आजा खेलस्य परितक्षायाम् ।

सद्यो जंहुग्रामायसौं विशपलायै

धने हिते सर्त्त्वे प्रत्यधत्तम् ॥

Rgveda—15th Rk., 1st Mandala, 116 Sūkt

अगस्त्य पुरीहितः खेली नाम राजा तस्य सम्बन्धिनी विशपलानामस्त्रौ, संया शत्रुभिः क्षिप्रपदा आसीत् । पुरीहितेन अगस्त्येन स्तुतौ अश्विनौ रात्रौ आगत्य आयीम पादं समधत्तम् । तदेतदाह ‘आजा’—आजौ, संयामे, अगस्त्य पुरीहितस्य—खेलस राजतः सम्बन्धिन्याः विशपलाख्याया, ‘चरित्रं’—चरणं, ‘वेरिवं’—वे: पक्षिणः, ‘पर्णं’ पत्रः इव, ‘अच्छेदि हि’—पूरा छिन्नमभूत् खलु । हे अश्विनौ ! युवां अगस्त्येन स्तुतौ सन् “परितक्षायाम्”—रात्रौ, आगत्य, ‘सद्यः’—तदानीमेव, ‘सर्त्त्वे’—सर्त्त् गत्तुम् इत्यर्थः विशपलायै ‘आयसौ’;—लौहमयीम्, ‘जंहुग्राम्’—जंहुग्रामलक्षितं पादम्, ‘प्रत्यधत्तम्’—सन्धरनम् एकीकरणमित्यर्थः क्षतवन्तौ ।

we learn that when Parīkṣit, the king of the Kurus, became certain of his approaching death by snake-bite, due to a curse uttered by a sage, he tried to protect himself by the constant attendance of a number of physicians, who were well supplied with antidotes.¹ Again it is stated that when the great warrior Bhīṣma was wounded in war, the skillful army surgeons came to him with the necessary medical and surgical appliances to treat his wounds.² From the Mohāvāgga, we learn that Jīvaka, the personal physician of Buddha, practised cranial surgery with success.³ In the Mālavikāgnimitra, we find the use of charms—a signet

¹ संस्कृतमन्तिभिश्चैव स तथा मन्त्रतत्त्ववित् ।
प्रापादं कारयामास एकस्मां सुरचितं ।
रक्षाच्च विदधे तत्र भिषजशौषधानि च ।
ब्राह्मणान्मन्त्रसिद्धांश्च सर्वती दैन्ययोजयत् ।

Mahābhārata, Adi Parva, Ch. 42.

² उपातिष्ठन्थी वैद्याः शख्येहरणकीविदाः ।
सर्वोपकरणैर्युक्ताः कुशलैः साधु शिचिताः ।
तान् दृशा जाङ्गवीपुक्तः प्रीवाच तनयं तत्र ।
धनं दत्त्वा विस्त्यन्तां पूजयिला चिकित्सकाः ।
एवं गते भयेदानीं वैद्यैः कार्येभिहास्ति किं ।
चतुर्धर्मो प्रशस्ता हि प्राप्तीऽस्मि परमां गतिं ।
नैष धर्मो भव्यापालाः श्रतत्पगतस्य मे ।
एभिरेव शरैश्चाहं दग्धव्योऽस्मि नराधिपाः ।
तच्छुला वचनं तस्य पुक्ती दुर्योधनस्त्रव ।
वैद्यान् विसर्जयामास पूजयिला यथाऽर्हतः ।

Mahābhārata, Bhīṣma Parva, Ch. 121,
Vs. 5745—5750. (A.S.B. Ed.)

³ Mohāvāgga, VIII. 1.18.

ring as a healing talisman for the cure of snake-bite;¹ and also we find there a reference to a class of physicians who specialised themselves in Toxicology (*Viṣa-Vaidya*),² and were held in high esteem for their professional skill by the public.³ From the *Bhojaprabandha*, the administration of some kind of anæsthetic by inhalation before surgical operations can be ascertained. Similarly from the books of Law, we know the relations of the profession to society in general. In the *Manusamhitā*, we have unmistakable testimony of the decline of Hindu surgery as the author prohibits the eating of cooked rice from the hands of a surgeon.⁴

¹ सहि ! देवीए इदं सिप्पिसआसादी आनौदस्यागमुद्दासणाहं अङ्गुलीअत्रं सिप्पिङं णिभालअन्ती तृह उवालम्भे पञ्चिदग्नि ॥

Mālavikāgnimitra, Ch. I.

जय ।—जेदु जेदु भडा । धुवसिंडी विश्वेदी । उदकुम्भविधायेण सप्तमुहिंशा कपिदब्बा । ता अस्तेसीअदुत्ति । धारि ।—एदं सप्तमुहिंशम् अङ्गुलीअत्रम् । पञ्चा मह इत्थे णम् ।

Ibid, Ch. IV.

² परि ।—क्षेदी दंशस्य दाही वा चतस्यारत्तमीचणम् । एतानि दष्टमात्राणामाधुषाः प्रतिपत्तयः ॥ (संप्रति विषवैद्यानाम् कर्त्त्वे ।)

राजा ।—जयसेने ! धुवसिंडिः चिप्रमाहयताम् ॥

Ibid, Ch. IV.

³ निपु ।—पससुहवस्ती दीसदि । अवि अ धुवसिंडिणा चिङ्गसिंडी । मा से असङ्गणिङं पावं ॥

Ibid, Ch. IV.

⁴ चिकित्सकान्देवलकान्मांसविक्रियिणस्थाता ।

विपशेन च जीवन्ती वज्जाः स्युहृव्यकव्ययोः ॥

Manusamhitā, Ch. III, 152.

चिकित्सकस्य स्त्रगयोः क्रूरस्थीच्छिष्टभीजिनः ।

उथान्नं सूतिकान्नं च पर्याचान्तमनिर्दशम् ॥

Ibid, Ch. IV, 212.

Secondly, monuments or inscriptions scattered about the country have to be searched, as references found therein to the science of medicine, are more trustworthy than documents which may have been more or less tampered with by interpolations of subsequent writers. Thus we learn from the Edicts of Aśoka, that hospitals were established by him in different parts of his kingdom, not only for the treatment of suffering humanity but also for the brute creation¹.

Thirdly, personages and scenes in connection with medical practice, and figures of herbs may have been represented in works of art which must be thoroughly examined. But unfortunately we do not possess any such work of art and so we can learn nothing to our purpose from this source. In the interpretation of the subject of the Friezes of the Rani Naur and Ganesha's Cave, Dr. R. L. Mitra says,—“The shampooing in the Ganesa Cave may be for a parent, but the close seat with the right hand round the neck of the male personage in the other, would be highly unbecoming in an unmarried female. But if the stooping figure be taken to be that of a wounded man, a wounded priest for instance, the lady may be a maiden nursing him without any offence to propriety. It is true that the appearance of the figure on the mattress does not indicate suffering from a wound, but in the Rani Naur frieze, the stooping head affords some indication of it.”²

पूर्यं चिकित्सकस्यान्नं पुंश्चल्लास्वल्पमिन्द्रियम् ।
विषा वार्धूषिकस्यान्नं शस्त्रविक्रियणी मलम् ॥

Manusamhitā, Ch. IV, 220.

¹ Rock Inscriptions, Edict II.

² The Antiquities of Orissa, Vol. II, p. 11.

Fourthly, the various kinds of surgical instruments preserved in museums are to be examined and the reports of finds of surgical appliances in various localities are to be studied. We know what a flood of light has been thrown on ancient Greek surgery by the steady progress of archæological discovery and finds of instruments at Pompeii, Herculaneum and elsewhere, and by the study of the specimens preserved in the Naples museum, the Athens museum and other museums of Europe. But as far as I have been able to trace, our museums contain no finds supplying us with any information on the subject.

Fifthly, the literature of medicine itself should be thoroughly inquired into and excerpts elucidative of our subject should be compared with one another. "The detailed descriptions of the very numerous Hindu instruments, not being very minute or precise, Professor Wilson says, we can only conjecture what they may have been, from a consideration of the purport of their names, and the objects to which they were applied, in connection with the imperfect description given."¹ We are fortunate, however, in possessing a copious medical literature of great merit from very early times. We shall describe the important books in the introductory chapter, with short notices of their authors.

Sixthly, the comparative study of the science at the same period in other countries also furnishes us with valuable materials as regards the state of medicine in a country. It is well known that Sanskrit works are often written in a very terse language

¹ Royle's Antiquity of Hindu Medicine, foot-note, p. 59-60.

and it might be said with greater truth about the works of early Sanskrit authors, the comment of a learned critic about the style of Thucydides, the famous historian,—“the most obvious and characteristic of his peculiarities is an endeavour to express as much matter as possible in as few words as possible, to combine many thoughts into one, and always to leave the reader to supply something of his own. Hence his conciseness often becomes obscure.” I could not form any idea as to the shape of some of the surgical instruments from the descriptions given in the text books, and the commentators are often silent on those passages. But when I read the accounts of similar instruments in Greek and Roman literature, my difficulties at once cleared up. We know with what brilliant results comparative mythology and comparative philology have been studied of late years, and I am sure that a comparative study of medical science by scholars will lead to interesting discoveries. So I have added descriptions of the instruments according to the Greeks, Romans and Arabs at the end of the descriptions given in Sanskrit books : the former serving as commentaries on the latter.

Seventhly, in the accounts of historians, travellers and pilgrims from foreign countries, may be found notices of medical science, as they saw it practised during their sojourn in a country, and such impressions, if properly collated, may bear impartial testimony to the progress of the science at the time. Again, we must enquire if the original treatises of medicine can be proved to have been translated into different languages and whether the remedial agents of a country can be traced in the Pharmacopœias of different nations. Thus we

learn from the accounts of Houen Tsang and Fa Hian that charitable institutions such as hospitals, dispensaries and Pūnyasālās (Houses of Charity) were quite common in ancient India.¹ Arrian informs us in his *Indica* that the study of medicine among the Brahmans was in great favour.² We know that the standard works on medicine were translated in Arabic in the 8th Century B. C.,³ and that various medicinal herbs of Indian origin found their way into the Greek *Materia Medica*.⁴

Eighthly, , we must enquire whether the medical practice of ancient times is still resorted to by the physicians of the present days. The Hindu system of medicine is still being practised all over India, more or less in its original form, and so can still be studied at first hand. But for our present purpose, we derive little or no help from the *Vaids* of the present generation. They know practically nothing about anatomy and surgery which began to decline during the Buddhist era, and finally all vestiges of the science became lost during the Mahomedan rule. I have spared no pains to exhaust these sources of information so far as surgical instruments are concerned. Whether or not I have been fortunate enough to give just the necessary details of instruments from the best accessible authorities without at the same time loading my pages with superfluous matter, must be left to the judgment of my readers to determine.

¹ Beal's Buddhist Records of the Western World, Vol. I., P. 165, 198 and 214; Vol. II., p. 188 and 303.

² Arrian's *Indica* c. 27.

³ Alberuni's India, Sachau's Preface, p. XXX—XXXI.

⁴ Royle's Antiquity of Hindu Medicine, p. 77-113.

Now it may be asked why the Science and Art of Surgery, which was successfully practised in Ancient India, is so much neglected by the present generation of *Vaids*. So let us consider the causes that led to the downfall of Hindu Surgery:

1. The Hindus from a very early period have given up the dissection of human bodies—the only trustworthy method of acquiring anatomical knowledge—merely because it may occasion ceremonial uncleanliness. The Ancient Hindus were, however, free from such prejudices. Manu lays down that mere bathing will purify a Brahman who has touched a corpse,¹ whilst stroking a cow or looking at the Sun, having only sprinkled his mouth with water will remove the defilement due to touching a dead bone.² But even in the *Manusamhitā*, we can trace the decline of Hindu surgery, and his law forbidding any one from eating food from the hands of a doctor evidently refers to a surgeon.³

2. The interference of the priests in India, as in Europe played an important part. They began to cure diseases by spells, charms, texts and drugs; and temples have served as consulting rooms for the treatment as much of the diseases

¹ दिवाकीर्त्तिमुदकां च पतितं सूतिकां तथा ।

शर्वं ततस्यृष्टिनं चैव सृष्टा ज्ञानेन शुच्यति ॥

The Institutes of Manu, Ch. V, 85.

² नारं स्पृष्टास्यि सस्तेहं ज्ञाता विप्रो विशुच्यति ।

आचयैव तु निष्ठेहं गामालभ्यार्कनीत्यवा ॥

Ibid, Ch. V, 87.

³ Ibid, Ch. III, 152; Ch. IV, vs. 212 and 220.

of the body as of the soul. The example of such a temple we still find in Tārakeśvar where many sick people repair to have their maladies cured by dreams, hypnotic suggestions and incubation or temple-sleep. Similar 'practice was prevalent in Egypt and Greece in olden times. The modern practice of using galvanic rings and abdominal belts is merely an advanced method of indulging in superstitious ideas.

3. The patients always dreaded the surgeon's knife—especially when the use of a general anæsthetic was unknown. At the same time, the comparative success of poultices, actual and potential cauteries, and other external applications have influenced the lay mind that operations by knife are not always needed.¹ The Hindu surgeons themselves believed in similar tenets, for Suśruta, the surgeon, remarks that "of all cutting instruments and their substitutes, caustics (or vegetable alkalies) are the most important, because by means of them, deep and superficial incisions and scarifications may be made, and derangements of the three humours (air, bile and phlegm) may be rectified"; and again he says that "with

¹ दिव्यौषधिं विना देवि शस्त्रविद्या सुनिष्कला ।
वैरूप्यं कुरुते या च दुश्चिकित्स्ये व्यधान्तरे ॥
जायन्ते हि यथार्थसि पाटितानि पुनः पुनः ।
किं तत्र शस्त्रसाध्यं स्थात् सुसिद्धैभेषजैर्विना ॥
धातुनां व्यापदि यत्र भेषजं नैव सिद्धति ।
ह्याभये दुखरे तच्चिन् शस्त्रमेव विधीयते ॥
पुनः संश्मनं तत्र धातुनाम् ह्य प्रशान्तये ।
प्रदातव्यं महादेवि शस्त्रादर्ढाकृ ब्रवीमि ते ॥

regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not reappear, and because it can cure diseases which are incurable by medicines, instruments and caustics.”¹ Thus we see that the Hindus were partial to external applications as a cure of surgical diseases, and gradually they neglected the surgical operations—one of the most important means of acquiring knowledge in Morbid Anatomy and of testing the correctness of diagnosis, in the absence of the post mortem examinations of the cadavers. Thus not only surgery but medicine also suffered materially.

4. The Hindus always cherish a high regard for the writings of their sages, and the earliest works on medicine became the standard works and were held sacred. Any violation of their opinions was considered a sacrilege ; and all knowledge thus soon became stereotyped. In later times, none dared to question the validity of the statements contained therein, and though about three thousand years have elapsed, and though the votaries of the science are still honoured and wellpaid, the science instead of improving has markedly deteriorated. In fact, only two authors—Caraka and Suśrata—are original; the later authorities—and there is a vast number of them—were merely their servile copyists who only differed from them when they indulged in some grave errors. We have a parallel in the history of medical science in Europe, where Galen

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यातस्तद्विधानां रोगानामपुनर्भावविषजशस्त्रारैरसाधानां तत्साध्यलाच ।

held his sway over the profession for about two thousand years.

5. One of the potent causes of progressive decadence in the knowledge and practice of surgery amongst the Hindus is the rapid spread of Buddhism in India. Though Buddha sanctioned the use of the lancet in some cases, in cases of a doubtful nature he prohibited the use of instruments in the treatment of even surgical diseases. For example, he allowed the surgical treatment of boils by knife,¹ but he prohibited not only the use of the lancet for treatment of fistula-in-ano but the use of clysters also.² As it would be interesting to know the reasons of this prohibition, I quote the story in full from the *Mohāvāgga* (Sacred Books of the East):³

1. Now when the Blessed One had remained at Sāvatthi as long as he thought fit, he went forth on his journey to Rāgagaha ; and wandering straight on he arrived at Rāgagaha; and there at Rāgagaha he stayed at the Veluvana in the Kalandaka-nivāpa.

Now at that time a certain Bhikkhu was suffering from fistula. And the physician (named) Ākāsa-gotta lanced it. And the Blessed One when he was going round through the sleeping-places came to the place where that Bhikkhu dwelt.

2. Ākāsa-gotta, the physician, saw the Blessed One coming from afar ; and when he saw him he said to the Blessed One : ‘Let the venerable Gotama come and look at this Bhikkhu’s orifice ;

¹ *Mohāvāgga*, VI. 14. 4 & 5.

² *Ibid*, VI. 22. 3.

³ *Ibid*, VI. 22.

it is like the mouth of an iguana !' And the Blessed One thinking, 'This foolish fellow is making fun of me,' kept silence and turned away. And in that connection, and on account of that, he called a meeting of the Bhikkhu-samgha, and asked the Bhikkhus: 'Is there, O Bhikkhus, in that Vihâra a Bhikkhu who is sick ?'

'There is, Lord.'

'What is the matter, O Bhikkhus, with that Bhikkhu ?'

'That venerable one, Lord, has a fistula, and, Âkâsa-gotta the physician, has been lancing it.'

3. The Blessed Buddha rebuked (that Bhikkhu), saying, 'This is improper, O Bhikkhus, for that foolish one, unbecoming, indecent, unworthy of Samanas, not allowable and ought not to be done. How can this foolish fellow, O Bhikkhus, allow a surgical operation to be performed in that part of his body ? The skin there, O Bhikkhus, is tender, the wound is difficult to treat, the knife is difficult to guide. This will not redound, O Bhikkhus, to the conversion of the unconverted.'

And having rebuked him, the Blessed One, after delivering a religious discourse, said to the Bhikkhus: 'You are not, O Bhikkhus, to allow a surgical operation to be performed upon you in that part of your bodies. Whosoever allows that, is guilty of thullakkaya offence.'

4. Now at that time Khabbaggiya Bhikkhus, since a surgical operation had been forbidden by the Blessed One, used a clyster.

They told this thing to the Blessed One.

'Is it true, as they say, O Bhikkhus, that the Khabbaggiya Bhikkhus use a clyster ?'

'It is true, my Lord.'

He rebuked them, and having delivered a religious discourse, said to the Bhikkhus : 'No surgical operation is to be performed within a distance of two inches round the anus, and a clyster is not to be used. Whoever does so, is guilty of a thullakkaya offence.'

. And thus we find that Jivaka, the famous surgeon, is said to have cured a case of fistula-in-ano by the single application of an ointment.¹ The operation fell into such disuse that when Śāṅkarāchāryya suffered from the same disease, no surgical aid was thought necessary by the physicians, though it is said that he was treated by renowned doctors of the time.²

• From Megasthenes, we learn that "among the Sarmans the Hylobioi (living in woods) were held in most honour, and next to them the physicians, who are mendicants and also ascetics, like the class above them and the class below them,

¹ "And Gīvaka Komārabhakka healed the fistula of the Magadha King Seniya Bimbisāra by one anointing."

Mohāvāgga (Sacred Books of the East), VIII. 1. 15.

² अचिकित्स्यमग्न्दराख्यरोगप्रसरक्षीणितपङ्गिलखशाव्यां ।

अजुगुप्स्यविशेधनादिरूपां परिचर्यामङ्गताऽस्य तीटकार्यं ॥

* * * * *

निगदिते सुनिनेति भिषग्वरा विदधिरे वह्वागदसत्क्रियाः ।

न च शशाम गदीवहुतापदीविमनसः पटवो भिषजोऽभवन् ॥

which consisted of sorcerers and fortune-tellers;¹ and Strabo² mentions that these physicians "cured diseases by diet rather than by medicinal remedies, which were chiefly unguents and cataplasms."³

6. No science can flourish without the support of the government of the day. The Hindus became a subject race; and any departure from the traditional store of knowledge in the shape of improvement in the quality and additions to its quantity was neither tolerated by the people, who are proverbially conservative, nor countenanced by the royal court, for the conquerors brought with them and patronised their own hakeems and doctors. Neither the Mahomedans nor the English have taken any real interest in the Indian Medical Science from preconcieved notions that it contains nothing worthy of their perusal. The *Kavirajes* again are so conservative in their opinions that they can not boldly advocate even the use of such drugs as are of unquestionable value in the treatment of diseases, as for example the use of Quinine in Malaria. To this may be contrasted the behaviour of Bhāvamiśra, who lived about three hundred years back and who adopted many medicaments of foreign origin. The consequence can easily be imagined, and in the language of Elphinstone, can be thus described: "Physicians follow the practice of their instructor without inquiry, and surgery is so far neglected, that bleeding is left to the barber, bone-setting to the herdsman, and every one is ready to administer

¹ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 358.

² Geography, XV. i. 58-60.

³ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 368-69.

a blister, which is done with the juice of the euphorbium and still oftner with the actual cautery.”¹

But we need not enlarge any further. The object of this essay is not to write out an exhaustive dissertation on the Hindu medical science but by a few suggestive facts, however imperfect and fragmentary, to stimulate curiosity and divert attention of the diligent scholars to a vast field of research, which seems as yet to have been only partially explored.

It is proper here to acknowledge that I have on all occasions freely availed myself of the labours of Drs. Wise, Thakore Saheb of Gondal, and the translators of Suśruta Saṁhitā in the Bibliotheca Indica, namely, Dutt and Hoernle. It is a great pity that this translation has not as yet progressed beyond three fasciculi. Hoernle’s recent contribution, “Osteology of the Hindus,” is a move in the right direction and we hope it to be followed by similar enquiries in other branches of the science. Royle for the first time proved beyond doubt the high antiquity of Hindu medicine, and established its right position in the history of the science. Wise is the pioneer of systematic research in this field of study, and his sympathetic appreciation of the Hindu system of medicine will always be remembered with gratitude by our countrymen. Dutt’s Materia Medica of the Hindus is a work of great merit; and I have derived material assistance from the excellent treatise, “History of Aryan Medical Science,” by the Thakore Saheb of Gondal. Dr. Ray’s History of Hindu Chemistry is a valuable contribution in the cognate subject of chemistry. I have borrowed from these writers largely, but

¹ Elphinstone’s History of India, 5th Ed., p. 160.

I flatter myself it will also be found that I have further collected from various sources a store of valuable information, for which I am in no way indebted to any of my predecessors in the same field of research. The descriptions of the surgical instruments of the Greeks, the Romans and the Arabs, I have taken from the excellent English translations of Paulus *Aegineta*, the Extant Works of *Aetius* and the Genuine Works of Hippocrates, prepared by the renowned Adams, for the Sydenham Society. I have also laid the recent monograph, "Surgical instruments in Greek and Roman times" by Dr. Milne, largely under contribution ; I only regret that I had no access to the book a little earlier, otherwise much of my labour in search for descriptions of the instruments of the Greeks would have been saved. For the last five years, I have been engaged on this investigation and it was when I had nearly finished, that Milne's book was mentioned to me by the Hon'ble Mr. Justice Asutosh Mookerjee, the Vice-Chancellor of the Calcutta University and the President of the Asiatic Society of Bengal.

To complete the subject, I have added plates of nearly all the varieties of instruments ; but they are more or less hypothetical as we do not possess any actual specimens of the instruments of the Hindus. Written descriptions of surgical instruments are uninteresting and often fail to convey the true idea, which could be easily made evident by the pencil. For purposes of comparison I have given drawings of instruments of the Greeks, the Romans and the Arabs, when I thought that they might be of value for the proper elucidation of my subject. I am indebted to many authors

I am indebted to many authors for some of the engravings of the instruments. I have been careful to give the source whence the borrowed ones are taken, as far as I have been able to ascertain them. If this has been omitted in any case; it is from inadvertence, not from design. My best thanks are due to them and I here acknowledge my indebtedness to the authors for availing myself of their labours without their permission. But many new illustrations will be found, and I have appended my name to those drawn by myself. These figures of the surgical instruments would be found to tally better with the descriptions of the instruments given in the Sanskrit books than the illustrations of the previous authors. The drawings of surgical instruments as given by me would look more like the figures in a modern catalogue of surgical instruments. Some of my friends could hardly believe when they saw the plates that these instruments were known to the ancient Hindus at such an early age. This feeling of amazement and incredulity as regards the surgical instruments used by the ancient Hindus has its parallel in the observations of Billroth¹ about the surgical instruments found in the excavations at Pompeii and now preserved in the museum at Naples. He says: "It made a peculiar impression upon me, when I saw before me this two thousand years old surgical armamentarium of a Roman colleague, differing but slightly in the form of the more ordinary instruments from those of our time. *Ars longa vita brevis.*" Milne² also remarks: "The works of those (Paré, Scultetus and Heister) are profusely illustrated with instruments, some of which can plainly be seen to tally exactly with the descriptions of the classical authors."

¹ Billroth's Surgery, Vol. I, Introduction, Page 7. Syd. Soc. Ed.

² Greek-Roman Surgical Instruments. P. 8.

In describing the surgical instruments, I have confined myself strictly to the texts of the authors and commentators whom I have quoted, and have given the original Sanskrit passages in the foot-notes. These will be of great help to scholars who will try to study the subject at first hand, and prosecute further historical inquiries. The references in the foot-notes do not refer to pages of any particulars edition of the work, as such pagination causes inconvenience to the readers who may not secure the edition in question; so we have given the section, and chapter of the book which will be found in any edition.

In the translations of Sanskrit passages, I have endeavoured to follow the original as closely as possible, except where a somewhat free rendering was necessary to make the meaning clear.

The dates of the ancient Hindu authors of Sanskrit medical books cannot be ascertained with certainty. In the first chapter I have endeavoured to discuss briefly their approximate ages. But as I have compared the surgical instruments of the ancient Hindus with those of the Greeks, Romans and Arabs, a concise summary of the chronological dates of the Graeco-Roman, Arab, and the later authors would be a great help in the proper elucidation of my text.

<i>Authors.</i>		<i>Date.</i>
Pythagoras 580-504 B.C.
Megasthenes 300 B.C.
Ktesias 400 B.C.
Hippocrates 460 B.C.
Hero of Alexandria 285-222 B.C.

<i>Authors.</i>	<i>Date.</i>
Dioscorides	... First century A.D.
Celsus	... 25-30 B.C. to 45-50 A.D.
Scribonius Largus	... 45 A.D.
Soranus	... First century A.D.
Rufus of Ephesus	... 98-117 A.D.
Galen	... 131-201 A.D.
Marcellus Empiricus	... 300 A.D.
Antyllus	... 3rd century, A.D.
Oribasius,	... 326-403 A.D.
Theodore Priscianus	... 4th century A.D.
Caelius Aurelianus...	... 4th or 5th century A.D.
Moschion	... 5th century A.D.
Actius...	... 5th century A.D.
Alexendar of Tralles	... 525-605 A.D.
Paulus Ægineta	... 660 A.D.
Serapion	... 800 A.D.
Rhazes	... 850-932 A.D.
Haly Abbas	... After 950 A.D.
Avicenna	... 980-1037 A.D.
Abul Cassim	... x 1106 A.D.
Avenzoar	... x 1162 A.D.
Paré 1509-90 A.D.
Scultetus	... 1650 A.D.
Heister	... 1739 A.D.

I can not suffer this work to go forth without offering at least an explanation of, if not an apology for, the delay which has occurred in the publication of this thesis. It is mainly due to the accidental fire which reduced the types and the blocks

for this work to ashes and destroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not uncommon. Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirenānāth Mukhopādhāya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. But I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctorily and I have done my best. I have laboured with the usual drawbacks of an active professional life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

A copious index has been provided for this work, whereby anything material in the whole book may be readily found out; of which it may be said that it wants no other advantages than such as the author had not power to give.

It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last

session Dr. Girindranath Mukerjee submitted to the society a paper of considerable extent, in which he elaborately examined the subject of the surgical instruments of the ancient Hindus. The questions he has raised, as to the priority of Hindu medicine over that of the Greeks, the Romans and the Arabs, are likely to arouse controversy, but in whatever way the question of priority may be decided, it seems to me truly remarkable that the descriptions given in our most ancient books on medicine, of the surgical Instruments then in use, should bear a close resemblance to the descriptions given not only in Greek, Roman and Arab medical writings but in many cases with the descriptions given in modern works on surgery. I trust that this subject, so peculiarly Indian, will not be left alone and will receive the attention from investigators which it undoubtedly deserves.”¹

As regards the transliteration of Sanskrit words, we have employed the method adopted in the Congress of Orientalists and circulated in the Journal of the Royal Asiatic Society, ignoring in fact, the unpleasant characters of the Sacred Book of the East.

¹ Journal and Proceedings of the Asiatic Society of Bengal, Vol. V, 1909,
Annual Address, p. XXX.

I

SANSKRIT AND ALLIED ALPHABETS.

अ	<i>a</i>	ओ	<i>o</i>	उ	<i>t</i>	ब	<i>b</i>
आ	<i>ā</i>	औ	<i>au</i>	ठ	<i>th</i>	भ	<i>bh</i>
इ	<i>i</i>	क	<i>k</i>	ड	<i>d</i>	म	<i>m</i>
ई	<i>ī</i>	ख	<i>kh</i>	ड	<i>dh</i>	य	<i>y</i>
उ	<i>u</i>	ग	<i>g</i>	ण	<i>n</i>	र	<i>r</i>
ऊ	<i>ū</i>	घ	<i>gh</i>	त	<i>t</i>	ल	<i>l</i>
ऋ	<i>r</i>	ঙ	<i>n̄</i>	ঘ	<i>th</i>	ব	<i>v</i>
কু	<i>ṛ</i>	চ	<i>c</i>	দ	<i>d</i>	ঝ	<i>ś</i>
ঞ	<i>l̄</i>	ছ	<i>ch</i>	ঘ	<i>dh</i>	ষ	<i>ṣ</i>
ঞ	<i>l̄</i>	জ	<i>j</i>	ন	<i>n</i>	স	<i>s</i>
ঞ	<i>e</i>	ঝ	<i>jh</i>	প	<i>p</i>	হ	<i>h</i>
ঞ	<i>ai</i>	ঙ	<i>ñ</i>	ফ	<i>ph</i>	ঙ	<i>l̄</i>

• (*Anusvāra*) *m* s (*Avagraha*)

* (*Anunāsika*) *ṁ* *Udātta* *‿*

: (*Visarga*) *h* *Svarita* *׮*

× (*Jihvāmūliya*) *h̄* *Anudātta* *׿*

× (*Upadhmāniya*) *h̄*

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and commentaries. Vāgbhaṭa I,—Aṣṭāṅga Saṃgraha, his age, edition and commentary; Vāgbhat II: Aṣṭāṅga Hṛdaya Saṃhitā, editions and commentaries; Vagbhaṭā III—Rasa Ratna Samuccaya; Mādhavakara :—Nidāna; Vṛnda Madhava :—Siddhayoga; Cakrapāṇi-datta :—Cikitsāsāra Saṃgraha, editions; Śārangadhara:—Śāringadhara Saṃgraha, editions and commentary; Bhāva Miśra :—Bhava Prakāśa, editions.

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1. The Svastika yantra or cruciform Instruments : •
Simhamukha svastika or Lion-faced forceps.
Vyāghramukha or Tiger forceps. Vṛkamukha or Wolf forceps. Tarakṣumukha or Hyena forceps. Rkṣamukha or Bear forceps.
Dwipimukha or Panther forceps. Mārjāra-mukha or Cat forceps. Śṛgālamukha or Jackal forceps. Airbbāruka or Deer forceps. Kākamukha or Crow forceps. Kaṇkamukha or Heron forceps. Kuraramukha or Osprey forceps. Cāsamukha or Blue-Jay forceps. Bhāsamukha or Eagle forceps. Śaśaghātimukha or Hawk forceps. Ulukamukha or owl forceps. Cillimukha or Kite forceps. Syenamukha or Vulture forceps. Grdhramukha or Falcon forceps.

Krauñcamukha or Curlew forceps. Bhṛṅgarāja-mukha or Butcher-bird forceps. Añjalikarna forceps. Avabhañjanamukha forceps. Nandimukha forceps. II. The Sandamśa or Pincher-like forceps: Forceps with and without handles. Forceps with Smooth and rough ends. Epilation forceps. Mucuṭī or Mucundi. Vamśabidala or Bamboo forceps. III. Tāla-Yantra or Picklock-like instrument: Ectāla and Dvitāla. The Ear-scoop. IV. The Nadī-Yantra or Tubular instruments: Kanṭhaśalyā-valokinī or Throat speculum. Pañcamuka and Trimukha. Tubular instruments for inspection of arrows. Śalyanirghātanī. The Impel-lent. Tubular instruments for Piles—for inspection and medication. Śamī. The Rectal Specu-lum. Calopter. Tubular instruments for the Fistula-in-ano. Tubular instruments for the nose: Nasal Speculum. Nathu-karanī and Yamaka-nathu-karani. Nasal tubes. The Aṅguli-trāṇaka or Finger-guard. Yoni-Vranekṣana or Vaginal Speculum. Diopter. Bivalve Speculum. The tubular instruments for wounds—Vrana-vasti or Wound-Syringe. Tubular instrument for ascites. Dākodara yantra or Canula. Tubular instruments for Hydrocele. Tubular instruments for rectal stricture. Tubular instruments for injection into the rectum—Vasti Yantra or Rectal clyster. Uttaravasti or urethral, vaginal and uterine tubes. Catheters. Tubular instruments for inhalation and fumigation. Disinfection of rooms, clothes &c. Tubular instru-ments for cupping. Śringa or horn. Alābu Yantra or gourd. Ghati Yantra. V. Śalakā

or rods : Earthworm probes. Arrow probe. Snake's hood probe. Fish-hook probes. The Śāṅkus ; Swab probe. Spathomele or spatula probe. Spoon-shaped probes. Cyathiscomele. Nail-shaped probes. Jāmvavauṣṭha probe. Gamma-shaped probe and the aṅkuśa cautery. Collyrium probes. Kariṇa Śodhana or Ear-cleaner. Garbha-Śaṅku or Fœtus or Traction hook. Yujñā-Śaṅku or Midwifery forceps. Sarpa-faṇa or snake's hood-like rods. Stone-extractor. Hippocratic oath. Sarapuṇkha-mukha Probe. Arddhacandramukha or Half-moon Probe. Bone Lever. Director. Urethral Probe. VI. The Upayantra or Accessory Instruments. Rajju or thread, Venikā or twine ; Paṭṭa or Bandages, Abdominal binder, Field Hospital, Dressings. Carma or leather : leather bandage, leather ligatures. Yantra-Śaṭaka or Lithotomy Strap or binding apparatus, Pāśa. Leather bags. Śirovasti or leather-bag for the head. Leather Band, Leather Bottles, Jars, etc. Antarvalkala or Barks. The crutches, Tendrils of creepers or Latā. Vastra or cloth. Aṣṭhilāṣma or stone. Mudgara or Hammer. Pāṇipadatala or hand and foot. Aṅguli or fingers. Jihvā or tongue. Danta or tooth. Nakha or nails. Mukha or mouth. Vāla or hair. Probang. Sutnre material. Aśvakaṭaka or the ring of a horse's bridle. Śākhā or branch of a tree. Sṭhīvana or spittle. Pravāhana or fluxing the patient. Har a or Happiness. Ayaskānta or Load-stone. Kṣāra or Caustics or Potential cautery. Agni or Actual cautery. Bheṣaja or medicines. Goats' gut ; Arrest of hæmorrhage.

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„	317	„ 10	...
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„	320	„ 5	„ 1
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178	item 10	...	Obstetric	,, Obstetire.
181	...	„ 2	Gayadāsa	,, Gayadāssa.
196	line 12	...	Sesamum	,, Seasum.
219	„ 14	...	effectnal	,, effectual.
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331	line 18	...	Physician	,, Physian.
340	„ 5	...	amber	,, ambar.
346	„ 18	...	Paitamaha	,, Paitāmoha.
348	„ 2	...	Firoz	,, Firroz.
352	„ 22	...	Areca	,, Arecha.
354	„ 11	...	Dvārusita	,, Davrusita.
355	„ 12	...		

WORKS BY THE AUTHOR.

1. Muscles of the Human Body, arranged in Tabular forms.
Fourth Edition. Re. 1
2. Tropical Abscess of the Liver.

Thesis approved for the degree of Doctorate in Medicine,
Madras University. Rs. 5

3. Glossary of Indigenous Medicinal Plants.
(In the Press)
4. Notices, Biographical and Bibliographical, of the Indian
Physicians and their Works on Medicine.
(In the Press)
5. Medicine in the Vedic times.
(In preparation)

THE STAR MEDICAL HALL,
80, Russa Road North, Bhawanipur,
CALCUTTA.

THE Surgical Instruments of the Hindus.

CHAPTER I.

INTRODUCTION.

ANCIENT MEDICAL AUTHORS AND THEIR WORKS.

The Science and Art of Medicine, like many other different branches of learning originated with the Hindus. They consider the art of healing as an Upaveda and it is generally known as Āyurveda, that is the art of prolonging life. Like the Vedas, they trace the origin of the science to God, the fountain of all true knowledge. Bramhā transmitted this heaven-born science to this world for benefit of the mortals in one of the sacred writings, the Āyurveda.

It was composed as a sub-division of the Atharva Veda and consisted originally of a *lakh* *slokas* or a hundred thousand stanzas, divided into a thousand chapters. Then considering the short span of life and inadequate intelligence of man, he divided the book into eight parts¹ as follows:—

¹ तद्यथा ॥ शत्यं शालाकां कायचिकित्सा भूतविद्या कौमारभृत्यमगदतन्त्रम् रसायनतन्त्रं वाजीकरणतन्त्रमिति ॥

Suśruta Samhitā, I. i.

कायचिकित्सा शालाकां शत्यहर्तृकं विषगरवैरीधिकप्रशमनं भूतविद्या कौमारभृत्यकं रसायनानि वाजीकरणमिति ।

Caraka Samhitā, I. xxx.

वेदो ह्याथर्वंगः स्त्रस्ययनवलिमङ्गलहीमनियमप्रायचित्तोपवासमलादिपरियहात् चिकित्सा प्राह ।

Ibid.

1. Śalya Tantra or Major Surgery.
2. Śālākya Tantra or Surgery of parts above the Clavicles.
3. Kāya Cikitsā or Inner Medicine.
4. Bhūtvidyā or Demnology.
5. Kaumārabhṛtya or the Science of Pædiatrics.
6. Agada or Toxicology.
7. Rasāyana or Treatment to prolong life.
8. Vājikaraṇa or Treatment to stimulate the sexual power.

The book is no more available now, Suśruta being the authority for the above information. . . .

A different view is held by others, who trace the origin of Hindu Medicine in the verses of the R̄gveda.²

¹ इह खल्यायुर्वेदी नाम यदुपाङ्गमर्थवेदसानुत्पादैत्रव प्रजाः श्रीकशतसहस्र-
मध्यायसहस्रं कृतवान् स्वयम्भूः। ततोऽन्यायुष्मल्यमेधस्त्राचावलीकथ नराणां भूयोऽष्टधा
प्र॒श्नीतवान्॥

Suśruta Saṁhitā, I. i.

तत्र चेत् प्रष्टारः सुः चतुर्णाम्बृक्सामयजुरर्थवेदानां कं वेदमुपदिशत्यायुर्वेदविदः।
किमायुः कमादायुर्वेदः किञ्चायमायुर्वेदः शाश्वतोऽशाश्वत इति। कानि चासाङ्गानि
कशयमधिग्रतव्यः किमर्थच्छेति॥

तत्र भिषजा पृष्ठेनैवं चतुर्णाम्बृक्सामयजुरर्थवेदानाम् आत्मनीऽर्थवेदे भक्तिरादेश्या।

Caraka Saṁhitā, I. xxx.

The origin of medical science, as quoted in the above passage of Caraka, does not however agree with the view expressed by the author in the Sūtra Sthāna, Ch. I. (See footnote I. P. 4). In Ch. XXX, we find that an attempt had been made to make a compromise between the two views of Agniveśa and Suśruta. Evidently this was the work of a later redactor, possibly Dṛḍhavala.

न ह्यायुर्वेदसामूलीत्तिरपलभ्यते। अन्यचाववीधीपदेशाभ्यमितैः इयमधिक्लिय उत्पत्ति-
मुपदिशत्येके सामाविकचासप्रलक्षणमधिक्लिय यदुक्तम् इह चायेचाध्याये * * *॥

Caraka Saṁhitā, I. xxx.

² कृत्वेदसायुर्वेद उपवेदः।

Carana Vyūha by Vyāsa.

ATHARVA VEDA.

"On examining the contents of the Atharva Veda more in detail, we find that the hostile charms it contains are directed largely against various diseases or the demons which are supposed to cause them. There are spells to cure fever (takmān), leprosy, jaundice, dropsy, scrofula, cough, ophthalmia, baldness, lack of vital power, fractures and wounds; the bite of snakes or injurious insects, and poison in general; mania and other ailments. These charms are accompanied by the employment of appropriate herbs. Hence the Atharva Veda is the oldest literary monument of Indian Medicine."¹ This Veda can not belong to a period later than 1000 B. C., but possibly earlier.² It exists in the recensions of two different schools. That of the Paippalāda is only known in manuscript, discovered by Prof. Buhler in Kashmir and described by Prof. Roth in his tract *Der Atharva Veda in Kaschmir* (1875). The printed text, edited by Roth and Whitney in Berlin 1856, gives the recension of the Śaunaka School.³ It has been translated into English Prose by Whitney, 2 Vols.; into English verse by Griffith, 2 Vols., Benares, 1897, and with the omission of the unimportant

¹ Mcdonnel's Sanskrit Literature, P. 196.

अथर्ववेदस्य * * * * चतुर्थं वेदलेऽपि प्रायेणाभिचारदर्थत्वाद्यज्ञविद्यायामनुप-
योगाच्चानिर्देशः । तथाहि ऋग्वेदेनैव हौत्रं कुर्वन् यजुर्वेदेनाधर्वर्यवं सामवेदेनौह्नां च
यदेव च यै विद्याय सूक्तन्तेन ब्रह्मत्वमितिषुते स्त्रीसम्पाद्यतं यज्ञानां ज्ञायते ।

Kallīka Bhaṭṭa's Commentary on *Manu Samhitā*, Ch. III, Sloka I.

² On the date of Atharva Veda, see pp. CXL—CLXI, Prof. Lanman's Edition of Whitney's Transl.; Prof. Mcdonnel's Sanskrit Literature, pp. 185—201.

³ Index Vervorum in the Journal of the Am. Or. Soc. Vol. XII.

hymns, by Bloomfield¹ into English Prose, with notes, in Vol. XLIII of the Sacred Books of the East.

CARAKA SAMHITĀ.

In the Caraka Samhitā we find that Brahmā taught Dakṣa the science of medicine; Dakṣa became the preceptor of the Aśvin twins; they in their turn became the teachers of Indra and Indra imparted this knowledge to Bharadvāja who was sent by a conclave of sages to learn the art for the welfare of the human race.² Bharadvāja had Punarvasu Ātreya and the others as disciples. Ātreya's students were Agniveśa, Bhela, Jatukarṇa, Parāśara, Hārīta and Kṣārapāṇi, all of whom became celebrated as the authors of treatises on Medicine; the Caraka Samhitā being a revised and improved edition of the treatise of Agniveśa, which was declared to be the best production.³ Caraka did not, however, redact the whole

¹ He has also edited the Kauśika Sūtra of the Atharva Veda, with extracts from the commentaries of Dārita and Keśava (see Vol. XIV Journ. Am. Orient. Soc.). It is very useful as a help to the proper understanding of the meaning of a hymn.

² दौर्घजीवितमखिच्छन् भरदाज उपागमत् ।
इन्द्रसुग्रतपा बुद्धा श्ररण्यममरेष्वरम् ॥
ब्रह्मणा हि यथा प्रीक्तमायुर्बेदं प्रजापतिः ।
जयाह निखिलेनादावधिवनौ तु पुनस्ततः ॥
अधिवेद्यां भगवान् शक्तेः प्रतिपेदे ह केवलम् ।
ऋषिप्रीक्ती भरदाजस्तथा चक्रमुपागमत् ॥

Caraka Samhitā, I. i.

³ अथ सैचीपरः पुण्यमायुर्बेदं पुनर्जसुः ।
शिष्येभ्यो दत्तवान् प्रडभ्यः सर्वमृतानुकम्यथा ॥
अग्निवेशश्च भेलश्च जतुकर्णः पराश्ररः ।
हारीतः चारपाणिश्च जग्नुस्तमुनेवंचः ॥
बुद्धेर्विशेषस्त्रिवासीनोपदेशान्तरं मुनेः ।
तत्त्वस्थ कर्त्ता प्रथममधिवेशी यतोऽभवत् ॥
अथ भेलादयश्चकु ख्यं खं तत्वं क्षतानि च ।
आवयामासुरावेद्यं सर्विसहं सुसेधसः ॥

Ibid, I. i.

book;—the last forty-four chapters¹ were edited by Dr̥dhalava,² a native of Panchanadapura, long supposed to refer to Punjab (the land of five rivers) but at present identified with a town in Kashmir by Dr. Hoernle.³ Two other works, the treatises of Bhela and Hārīta, are still extant; the former existing in manuscript in the Tanjore Library⁴ and the latter as printed texts by *Kavirājes* K. C. Sen and B. L. Sen, of Calcutta.⁵

Now as regards the age of Caraka, there is great divergence of opinions. The Indians generally believe him to be a R̥ṣi of great antiquity while the European scholars try

¹ For a discussion on the part added by Dr̥dhalava, see Hoernle's Studies in Ancient Indian Medicine, J. R. A. S. 1908, P. 997-1002. Also see pp. 11-15 in the *Vanauśadhi Darpaṇa*, Vol. I., by *Kavirāja Birajā Charan Gupta*, 1908.

² अतस्तत्त्वीत्तमभिदं चरकेणातिवुद्धिना ।

संखृतं तत् तु संस्कृतं विभागेनोपलक्ष्यते ॥

इदमन्यूनश्चदार्थं तत्त्वं दीघविवर्जितं ।

अखण्डार्थं दृढ़वली जातः पञ्चनदे पूरे ॥

क्लवा वह्न्यस्तत्त्वेभ्यो विशेषाच्च वलीच्छयम् ।

सप्तदशैषधात्यायसिद्धिक्लैरपूरयत् ॥

Caraka Saṁhitā, VIII, xii.

अस्मिन् सप्तदशात्यायाः कल्पाः सिद्धय एव च ।

नासाद्यन्तेऽधिवेशस्य तत्त्वे चरकसंख्यते ॥

तानेतान् कापिलवलः श्रेष्ठान् दृढ़वलीऽकरीत् ।

तत्त्वस्यास्य महार्थस्य पूरणार्थं यथातयम् ॥

Ibid, VI, xxx.

³ Hoernle's Studies in the Medicine of Ancient India, Part I, Osteology, Introduction, p. 2. See also his article on "The authorship of Caraka Saṁhitā" in the *Archiv für die Geschichte der Medizin*, 1907.

⁴ See Burnell's Tanjore Catalogue No. 10773 of Sanskrit MSS., P. 63.

⁵ It is doubtful whether the Hārīta Saṁhitā is the genuine work of the R̥ṣi, Hārīta. The printed text refers to Caraka, Sn̥śruta and even Vāgbhaṭa, who were decidedly posterior to Hārīta. See the Footnote 3, P. 6.

to connect him with historical events of more modern times. Sylvain Lévi has recently discovered in the Chinese Translation of the Buddhist *Tripiṭaka* that Caraka was the Court Physician of the Indo-Scythian King Kaniṣka, in the first century A.D.¹ But the following objections are to be met with before his conclusions can be accepted as proved :—

1. The age of Kaniṣka is not yet settled, the probable limits of his reign being from the first century B. C. to the second century A. D.² Moreover in the Buddhist *Tripiṭaka* referred to, the name of Caraka is simply mentioned as the Court Physician of the King Kaniṣka but there is nothing to identify him with the author of the book. The same name, found in different places, does by no means signify the same person.

2. The time assigned to Caraka by the Indian medical tradition is of great antiquity. With regard to the chronological position of the three old authors, he is mentioned as anterior to Suśruta and Vāgbhaṭa I.³

3. Dr. Rāy has pointed out that the name Caraka is patronymic in the Veda.⁴ It is quite possible that a much

¹ See Journal Asiatique—July to December 1896, p. 444 to 484 and January to June 1897, p. 5 to 42; also Indian Antiquary Vol. XXXII, 1903, p. 382 and Vienna Oriental Journal, Vol. XI., p. 164.

² See V. A. Smith's Early History of India, P. 225-26.

Dr. Fleet in J. R. A. S., 1906, P. 979.

Dr. Bhandarkar in J. R. A. S. (Bombay Branch), Vol. XX, P. 269.

J. A. S. B. Vol. XXXIX, 1870, p. 65 and 126.

³ चरकः सुश्रुतश्चैव वाग्भटश्च तथापरः ।
सुख्याश्च संहिता बाच्यालिख एव युगे युगे ॥
अचिः क्षतयुगे वैद्यी हापरे सुश्रुती मतः ।
कलौ वाग्भटनामा च गरिमाच्च प्रदृश्यते ।

Hērita Saṁhitā, Parīśṭādhāya.

⁴ Dr. P. C. Rāy's History of Hindu Chemistry, Introduction, P. X.

later namesake of his, is referred to by the *Tripitaka*, just as we know that more than one Vāgbhaṭa appeared as successful physician. Again we have evidence that eminent physicians in later times were called Caraka by way of a compliment and so Vāgbhaṭa was called Caraka of Sindh or Sindhicara.

4. Pāṇini wrote special Sūtras for the Agniveśas and the Carakas.¹ These names must have been famous before Pāṇini's time, otherwise he would not have written special Sūtras for them. Prof. Goldstucker has conclusively proved that Pāṇini could not have flourished later than the sixth century B. C.²

5. Patañjali wrote a commentary on Caraka.³ He flourished during the second century B. C. Both Cakrapāṇi-datta and Bhoja allude to him as the redactor of Caraka Saṁhitā.⁴ So Caraka must have flourished long before him, for unless his work was regarded as a standard work of authority, Patañjali would not have taken so much pains to write notes on the book, and still more for issuing a redaction.

6. The internal evidence of the book itself speaks against such an assumption. There is no salutation to any deity at the

¹ कटचरकालूक। Pāṇini 4. 3. 107.

गर्गादिभ्य यत्र ॥ Ibid, 4. 1. 105.

गर्ग। वत्स। * * * * अग्निवेश * * * * पराशर। जतुकर्ण। * * *.

² Goldstucker's Pāṇini; and Journal of the Asiatic Society of Bengal, Vol. XLII, P. 254.

³ आमीनाम् अनुभवेन वस्तुतत्वस्त्र कात्क्षेन निश्चयवान्, रागादिवशादपि नान्यथावादौ यः स इति चरके पतञ्जलिः।

Quoted in Laghumāñjuṣā of Nāgeśa Bhaṭṭa (Rāy).

⁴ पातञ्जल—महाभाष्य—चरकप्रतिसंस्कृतैः।

मनोवाक्-कायदीषाणाम् हर्त्रैहिपतयै नमः ॥

Vide salutation in the Āyurvedārthadīpikā.

beginning of the book,—a custom invariably found to be observed in the more modern compilations. There is complete absence of Paurānic theology in the Caraka Saṁhitā, nor is there any reference to Śākyā Muni and his religion. Kaniṣka was a great patron of Buddhism, and it might naturally be expected from the Court Physician of the king to describe the charitable hospitals which we know from the edict of Aśoka, to have flourished in every quarter of India. On the contrary we find descriptions of a hospital as reserved for rich men only at their own houses. Those gods and goddesses that figure so prominently in the Purāṇas were unknown during his time.¹ Beef was not then, apparently, a

¹ No doubt the names of Lakṣmī, Kṛṣṇa and Vāsudeva occur in Cikitsita Sthānam, Chapter XXV, but it should be remembered that they occur in the Supplement added by Dṛḍhavala in later times.

सर्वग्रहा न तत्र प्रभवन्ति न चाग्निश्वस्त्रृपचौराः ।
 लक्ष्मीश्च तत्र भजते यत्र महाग्रस्त्रृप्यस्ति ॥
 पितृमाण इमञ्चाद सिङ्गं मल्लमूदीरयेत् ।
 मम माता जया नाम विजयो नाम मे पिता ॥
 सोऽहं जयो जयापुत्रो विजयोऽथ जयामि च ।
 नमः पुरुषसिंहाय विष्णवे विश्ववर्कर्मणे ॥
 सनातनाय कृष्णाय भवाय विभवाय च ।
 तेजो हषाकपे: साक्षात् तेजो ब्रह्मेन्द्रियोर्थमे ॥
 यथाहं नाभिजानामि वासुदेवपराजयम् ।

Caraka Saṁhitā, VI, xxv.

But Kṛṣṇa and Vāsudeva are mentioned in Pāṇini as demigods, having many adherents who formed a class. “वासुदेवार्जुनाभ्यु तुन्” Pāṇini, 4. 3. 98. Again the passage may be an interpolation of a subsequent Vaiṣṇava Vaid.

So Br̥ṣavadvaja is also mentioned in Dṛḍhavala's Supplement, as a god to be worshipped during the preparation of some medicines :

ब्रह्मघीषश्वहप्टहमेरीनिनादैः सिङ्गं सितच्छवक्षतच्छायं गजस्त्रमारीपयैहशवन्तं
 वृषभजमभिपूज्य तं स्त्रेहं विभागमाच्चिकमङ्गलाशीःसुतिदेवतार्चनैर्वक्षिः गमयेत् ॥

Ibid, VIII, xii.

forbidden food, for it is spoken of as an article of diet that should not be indulged daily,¹ nor should it be used in excessive quantity as it is mentioned as a cause of the disease, Vāta-Rakta.²

The style of the book is antiquated and decidedly savours that of the Brāhmaṇas. Nāya and Vaiśeṣiki systems occur in the text,³ and so probably the book was written long before the compilation of these Sūtras.

Editions.—The book had undergone several editions. It was edited by Jibānanda Vidyāsāgar, Calcutta, in 1877 and 1896 (2nd Ed.) ; by Gaṅgādhar Kaviratna, Berhampur, 1879 ; by Gupta, Calcutta, 1897 ; with commentary by Cakrapāṇidatta, Calcutta, 1892-93 ; by Jaśodānandana Sarkār, with Bengali translation, 1894.

Translations.—It had been translated into English by A. C. Kaviratna, Calcutta, 1897. Caraka was translated from Sanskrit

And we find that the antidote to poison called महागच्छस्त्रै is said to have been told by Tryambaka (Śiva) to Baīravaṇa (Kuvera):

अगदीद्रुबं वैश्वरणाख्यातत्युष्मकेण प्रटपः ।

Caraka Saṃhitā, VI. xxv.

Also we find the name of Kārttikeya mentioned in Sec. IV. ch. viii.

प्रसुव लभिक्षिदमभिक्षिदा शुभानने,

कार्त्तिकेययुतिं पुच्चं कार्त्तिकेयाभिरच्छितमिति ॥

¹ कुर्चिकांश्च किलाटांश्च शौकरं गव्यमानिषं ।

मत्सान् दधि च माषांश्च यावकांश्च न शैलयेत् ॥

Ibid, I. v.

² कुलत्यमाषनिष्पावशाकादिपत्तिकुभिः ।

दध्नारनीलसौवीरगुक्तकसुरासवैः ॥

Ibid, VI. xxix.

³ Vide Caraka, III. viii.

into Arabic in the beginning of the eighth century and his name "Sharaka Indianus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka¹ from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrist, (Finished 987 A.D.). It is likewise mentioned by Albérūnī²; the translation is said to have been made for the Barmekides."³, Albérūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Ali Ibn Zain, from Trabaristan."⁴

Commentaries.—

1. Patañjali—2nd century B.C.—not available.
2. Cakrapāṇidatta's Caraka Tātparya Tīkā, or Āyurvedadīpikā⁵—1060 A.D.
3. Haricandra⁶—1111 A.D.—not available.
4. Śibadāsa's Caraka-Tattva-Pradīpikā.
5. Gaṅgādhar's Jalpa-Kalpa-Taru—1879 A.D.

¹ Proceedings of the As. Soc., Bengal, 1870, September.

² Reinand, *Mémoire sur l'Inde*, P. 316.

³ Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

⁴ Sachau's preface to India, P. XL.

⁵ See Caraka Saṁhitā with Cakrapāṇidatta's Commentary by Kavirāja Harināth Viśārada, Calcutta, 1895.

⁶ A Commentary written by Haricandra is referred to in the Sanskrit Slokas narrating the genealogy of Maheśvara, the author of Viśvaprakāśa and Sāhasāṅkacarita, who flourished during the reign of Sāhasāṅka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

श्रीसाहसाङ्गृपतेरणवद्यविद्य-

वैदीत्तरङ्ग पदपञ्चिमेव विभृत् ।

यशन्द्रचाहचरितो इरिचन्द्रनामा

सद्गाम्यथा चरकत्वमलंचकार ॥

SUŚRUTA SAMĀHITĀ.

The next treatise on Hindu Medicine is the Suśruta Samāhitā. Suśruta was the son of the sage Viśvāmitra,¹ a contemporary of Rāma. He learned the Science of Medicine from Divodāsa, surnamed Dhanvantari, king of Benares, at his Himalayan retreat. According to Suśruta, Divodāsa was the incarnation of Dhanvantari, the celebrated physician of the gods in heaven, and he first propounded the Art of Healing in this world.² Suśruta represented the Surgical School while Caraka was pre-eminently a Physician in practice.

As regards the authorship of the book, opinions differ. To Suśruta, Dhanvantari addressed his lectures on Major Surgery,³

¹ Mahābhārata, Anuśāsana Parva, Ch. 139, Vs. 8-11.

धन्वन्तरिर्धर्मभृतां वरिष्ठो वाग्विशारदः ।

विश्वामित्राक्षमजस्त्विं शिष्यं सुश्रुतमप्यशान् ॥

Suśruta Samāhitā, V. ii.

अष्टाङ्गयच्चेदबिदं दिवीदासं महामतिं ।

किञ्चत्रशास्त्रार्थसन्देहं सूच्चमागाधमिबोहिं ।

विश्वामित्रसुतः श्रीमान् सुश्रुतः परिपृच्छति ।

Ibid, VI. Ixvi.

सर्वशास्त्रार्थतत्त्वज्ञ स्तपोट्टिं रुदारधीः ।

वैश्वामित्रं शशासाथ शिष्यं काश्चिपतिर्मुनिः ॥

Ibid, VI. xxvii.

² अथ खलु भगवन्तमरवरस्त्रिगणपरिष्ठितमाशमस्यं काश्चिराजं दिवीदासं धन्वन्तरिमौपृष्ठनवैतरण्यौरभपोक्तालावतकरवौर्यगोपुररचितसुश्रुतप्रभृतय ऊचुः ।

Ibid, I. i.

³ अत्र कथै किमुच्यामिति । त ऊचुः । अत्याकं सर्वेषामेव शत्यज्ञानमूलं क्लवीपदिश्तु भगवान्ति । स उवाचैवमस्तुति । अत्याकमेकमतीनां मतमभिसमौद्य सुश्रुतो भगवन्तं प्रत्यति ।

Ibid, I. i.

which he reproduced in this work. But in the opening lines of the book, salutation is offered to Brahmā, Dakṣa, Aśvins, Indrā, Dhanvantari, Suśruta and others.¹ This shows that Suśruta can not be the author of the work or at least of the work in its present shape, for no author can offer salutation to himself. By "the others" are no doubt meant the notable surgeons who practised and taught the Science of Surgery and who were either contemporary with or posterior to Suśruta. Possibly the original Suśruta Saṁhitā had been recast and the redactor could appropriately offer a salutation to the original author and to other surgeons who flourished before him. There is also an Indian medical tradition, noted in Dallanacārya's Commentary, which assigns the improved and supplemented edition of Suśruta's original work to Nāgārjūna,² the celebrated Buddhist Chemist, who is said to have been a contemporary of the king Sātvāhana.³

In the third chapter, Suśruta enumerates the subjects described by him,—the chapter forming an index of the book. Therein he mentions the five principal divisions of his book and says that the Uttara Tantra or the Supplement would be

¹ नमो ब्रह्मप्रजापत्येतिवलभिङ्गन्तरिसुश्रुतप्रस्तुतिभ्यः ।

Suśruta Saṁhitā, I.

² यत यत परौचे नियीमस्तव तदैव प्रतिसंख्यात् सूक्तं ज्ञातव्यमिति । प्रतिसंख्यापौह नागार्जुन एव ।

Dallana's Commentary to Suśruta, I. i.

See also Dr. Cordier's Recentes Découvertes, pp. 12-13.

³ See Harṣacarita by Vāna.

Beal's *Buddhist Records of the Western World*, Vol II., P. 209, 212, 216.

Burgess' Archaeological Survey of S. India.

Introd. à l'histoire du Budh. Ind., P. 508.

described afterwards.¹ Now the fact that the sixth part was appended to the work as a Supplement or Uttara Tantra (*i.e.*, after treatise) clearly shows that it was written afterwards by another surgeon and added to the original treatise. If the original Suśruta wished to have six divisions of his book, he would have mentioned it clearly in the index and would not have, after stating that his book consisted of five parts, added that "the Supplement would be described afterwards,"² which seems to be an interpolation of the Supplementor to pass his edition as the orginal work of the author. Again at the end of the fifth section, there is a passage describing the importance of the Āyurveda, which was meant as the conclusion of the book by the author.³ It is to be noted,

¹ प्रागभिहितं सविश्वस्यायशतं पञ्चसु स्थानेषु । तत्र सूतस्थानमध्यायाः षट्चलारिंशत् । वीडश निदानानि । दश शारीराणि । चलारिंशचिकित्सानि । अष्टो कल्पाः । वदुत्तरं षट्षष्ठिः ।

अध्यायानां शतं विश्वसेवमेतदुदीरितम् ।

अतःपरं स्वनाम्नैव तत्त्वमुच्चरमुच्यते ॥

Suśruta Saṃhitā, I. iii.

² वीजं चिकित्सितमैतत् समासेन प्रकीर्तितम् ।

सविश्वस्यायशतमस्य व्याख्या भविष्यति ॥

तत्र सविश्वस्यायशतं पञ्चसु स्थानेषु । तत्र सूतस्थाननिदानशारीरचिकित्सितकल्पे-
ष्टथवशात् संविभज्योत्तरे तत्त्वे शेषानर्थान् व्याख्यायासप्राप्तः ।

Ibid, I. i.

³ सविश्वस्यायशतमेतदुत्तं विभागशः ।

इहीहिटाननिहिटान् सर्वान् वत्याम्यथीत्तरे ॥

सनातनत्वादेदानामद्वात्तथैव च ॥

तथा दृष्टफलत्वाच्च हितत्वादपि देहिनां ।

वाक्समूहार्थविलारात् पूजितत्वाच्च देहिभिः ॥

चिकित्सितात्पुण्यतमं न किञ्चिदपि सुश्रुत ।

ऋग्येरन्द्रप्रभावस्याद्यतयीनेभिर्गुरीः ॥

धारयित्वा तु विमलं नतम् परमसन्ध्यत ।

उक्ताहार समाचारर्द्दृह प्रेत्य च मोदते ॥

Ibid, V. viii.

that at the end of no other sections do we find a similar passage. He also writes: "Thus one hundred and twenty chapters are described" but adds: "The other diseases shall be described in the Uttara Tantra": the latter part no doubt is an interpolation of the Supplementor. Moreover, in the opening lines which serve as a preface to the sixth part, the authority quoted for the diseases of the eye is Nimi, the king Janaka of Mithilā and not Dhanvantari.¹ But in the first chapter of the first section, it is described that the sages wanted Dhanvantari to teach them Śalyatantra or Major Surgery only and he consented to their request. And this subject he treated in detail in the five sections of the book. In the Supplement, on the other hand, are described the other branches of the science such as Minor Surgery, Inner Medicine, &c. Probably this part was added afterwards to give completeness to the treatise; and the original Suśruta was called Vṛddhya or the Old by the commentators to distinguish him from the Supplementor.

Suśruta's work is specially important to us as having two whole chapters (vii and viii of Section I.) devoted to the descriptions of Surgical Instruments and one whole chapter (xxv of Section I.) to the principles of Surgical Operations.

The age of Suśruta is also involved in obscurity. Nothing can be ascertained from the fact that he was a son of Viśvāmitra²,

¹ अथायानां शते विशेषं यदुक्तमसत्त्वन्मया ।
वृत्त्यामि वहुधा सम्बुद्धरेऽर्थानिमानिति ॥
इदानीन्तत् प्रवृत्त्यामि तत्त्वमुच्चरमुच्चम् ।
निखिलेनोपदिश्यन्ते यत्र रोगाः पृथग्विधाः ॥
शालाक्यशास्त्राभिहिता विदेहाधिपक्वीर्तिताः ॥

Suśruta Samhitā, VI. i.

² Viśvāmitra is the *gotra* name; so the simple name may either refer to the great Viśvāmitra or to his descendants.

for the age in which the latter lived is not known to us. But he must have flourished during the Vedic Age as many Vedic Hymns are ascribed to him. In the Mahābhārata, Suśruta is mentioned as one of the sons of Viśvāmitra¹ and in the Suśruta Saṃhitā the author is often described as his son. The age of the great epic has, with good reasons, been fixed at 1000 B.C. So Suśruta must have flourished much earlier. The latest limit which we can assign to Suśruta is 600 B.C. as "there are indications in the *Satapatha Brāhmaṇa*, a secondary Vedic work, that the author of it was acquainted with the doctrines of Suśruta" as regards the Osteology. "The exact date of that work is not known, but it is with good reason referred to the sixth century B.C." Again in the Atharva Veda, in the tenth book, there is a hymn on the creation of man in which the skeleton is described according to Ātreya and Suśruta.² "The large portion of it (Books I to XVIII) indeed admittedly belongs to a much earlier period, possibly as early as about 1000 B.C.; and the hymn in question is included in this older portion"³. This shows that Suśruta could not have flourished later than 1000 B.C.

Again in Hastī-Āyurveda, a book on the Treatment of

¹ श्वामायनोऽथ गार्यश्च जावलिसुश्रुतस्था—

* * * * *

विश्वामित्राभजाः सर्वे मुनयो ब्रह्मवादिनः ॥

Mahābhārata, Anuśāsana Parva, Ch. IV.

² See J. R. A. S., 1906, P. 915; 1907, P. 1.

³ Hoernle's Studies in the Medicine of Ancient India, Part I. Osteology, Introduction, P. 9.

Elephants by Pālakāpya,¹ we find the Surgical instruments described after the manner of Suśruta. Pālakāpya lived as a Veterinary Surgeon in the Court of Romapāda, King of Aṅga, which had as its capital the famous town of Campā, identified with the modern town of Bhāgalpur. King Romapāda was contemporary with king Daśaratha, the father of Rāma, the hero of Rāmāyana.² Here we have a corroborative evidence of the age of Suśruta.

Suśruta is mentioned in the *Vārttikas* of Kātyāyana³ who flourished during the fourth century B.C.

We have alluded to Nāgārjjūna,⁴ the Buddhist Chemist, as the redactor of the Suśruta Saṁhitā. He is said to have been a contemporary of king Kaniṣka that is about the first century B.C.

Another revision was undertaken by Candrade, the son of Tisāta, the author of Cikitsā-kalikā. He revised the text which must have fallen then into a state of corruption. The probable date of Candrade is the ninth century A.D.⁴

¹ अग्नि शुश्रूषमाणस्त्र पितरं च यश्विनम् ।

एतद्विष्वेवकाले तु रोमपाद प्रतापवान् ।

Rāmāyana, Vālakāndam, Ch. IX.

See also Rāmāyana, i, 11, 13-20 ; Mahābhārat, iii, 110, 10008-9 ; Bhāgavat, ix, 23, 7-10.

² सुश्रुतेन प्रीक्तं सौश्रुतं ।

³ Possibly more than one Nāgārjjūna appeared in ancient India as a chemist. Albérūni says : "He lived nearly a hundred years before our time" (India, I. P. 189). Rājtarāṅgini places him in the 3rd century B.C. (I. Vs. 172-173). The modern scholars are of opinion that the founder of the Mahāyāna system lived in the first century A.D.

⁴ Hoernle's Osteology, p. 100.

There is no doubt of the tradition that Suśrūta's work was redacted, for the author could not write such a passage as follows: "The surgical treatises of Aupadhenava, Aurabhra, Suśruta and Pouṣkalāvata from the basis of other treatises on the subject."¹

*Commentators.*²—

1. Cakrapāṇidatta—Vānumati—1060 A.D.
2. Gayadāsa—{Nyāya Candrikā or Pañjikā }—11th century A.D.
3. Jejjatācāryya.
4. Bhāskara.
5. Mādhava.
6. Bramhadeva.
7. Dallanācāryya—Nibandha Samgraha—12th century A.D.
8. Ubhalta (Kashmir).

Editions.—Suśruta Saṃhitā has been edited by Madhusūdan Gupta, Calcutta, 1835; by J. Vidyāsāgar, 3rd Edition, Calcutta, 1889; by A. C. Kaviratna, Calcutta, 1888-95; by Prabhurām Jībanarām, Bombay, 1901; and by Virasvāmī, Madras.

This book has been translated into English in part only by U. C. Datta 1883, A. Chāṭṭopādhyāy 1891, Hoernle 1897, Calcutta, in the Bibliotheca Indicā. It has been translated into Latin by Hessler and into German by Vullurs.

The book was translated into Arabic before the end of the eighth century A.D. It is called "Kitab-Shawshoon-al-Hindi"

श्रीपद्मनवमौरवं सौश्रुतं पौष्करावतम् ।

श्रेष्ठाण्णं शल्यतन्त्राण्णं मूलान्धेतानि निर्दिशेत् ॥

Suśruta Saṃhitā, I. iv.

* * * * * श्रीसहनपालदेवनृपतिवज्ञभः श्रीडल्लणः समभूत् । तेज
श्रीजैञ्जभट् टीकाकारं श्रीगयदासभास्करौ च पञ्चिकाकारौ श्रीमाधविव्रज्ञ-
देवादीन् टीपनककारांशीपजीव्यायुव्यंदशास्त्र सुश्रुतव्याख्यानाथ निवन्धसंग्रहः क्रियते ।

Dallana's Commentary, I. i.

and also mentioned as "Kitab-i-Susrud" or Book Suśruta by Ibn Abillsaibial. Rhazes often quotes Sarad as an authority in Surgery.¹

VĀGBHATA I.

The next author of celebrity and whose work is still extant is Vāgbhaṭa I or Vāgbhaṭa the elder, the author of Aṣṭāṅga Saṃgraha (*i.e.*, Compilation of the Octopartrite Science). In later times, a namesake of his, wrote another work called Aṣṭāṅga Hṛdaya Saṃhitā (or the best Compendium *i.e.*, the Heart of the Octopartrite Science). In the Uttara Sthāna, Vāgbhaṭa the younger distinctly states that his Compendium is based on the Compilation of Vāgbhaṭa the elder.²

As regards the age of Vāgbhaṭa the elder, there is the same uncertainty as with his predecessors. We are however sure that he is posterior to Caraka and Suśruta for he refers to these writers by name.³

The chronological relation of the three early authors is described in a popular couplet that Ātreya, Suśruta and Vāgbhaṭa were the three great medical authors for the three Yugas—

¹ "His next description is from an author named Sarad, whom he frequently quotes in other parts of his works".

Adam's Commentary on Paulus Aeginetta, VI. lxi.

² अष्टाङ्गवैद्यकामहीदधिमन्यनेन योऽष्टाङ्गसंग्रहमहासृतराशिराम् ।

तत्त्वादन्त्यफलमत्यसमुद्यमाणां प्रीतर्थमेतददितं पृथगेव तत्त्वम् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, Uttara Sthāna, Ch. XL, v. 82.

³ By name, *e.g.* in Saṃgraha, Bombay ed., Vol. I, P. 246; Vol. II, P. 421. Again quoted from Caraka, *Ibid.*, Vol. I, pp. 20, 93; Vol. II, pp. 212, 213, *et passim*; from Suśruta I, *ibid.*, Vol. I. pp. 109, 121, 177, 247; Vol. II, p. 303, *et passim*. (Hoernle).

the Tretā, Dvāpara and Kali, respectively.¹ They are known as the Vṛddha Trayī or the Old Triad. This medical tradition goes much against the conclusion of Dr. Hoernle that Vāgbhaṭa I must have flourished early in the seventh century A.D. One of the reasons put forward by him is the fact, that "the Buddhist pilgrim I'Tsing, who resided ten years in the Nalandā University (in Bihar) from about 675-686 A.D., states in *Records of Buddhist practices* that the eight arts (*i.e.*, the branches of medicine) formerly existed in eight books but lately a man epitomised them and made them on one bundle (or book)."² Professor Jolly understands by it the Suśruta Saṃhitā while Dr. Hoernle points out with more reasons that it refers to Vāgbhaṭa I's work, the Aṣṭāṅga Saṃgraha (*i.e.*, the Compilation of the Octopartrite Science) and rules out Suśruta by the word "lately."³ But the description that I'Tsing gives of the contents of the book does not warrant any reference to either. Moreover, he has not given any reason why Vāgbhaṭa II's book Aṣṭāṅga Hṛdaya Saṃhitā (the best Compendium of the Octopartrite Science) might not be alluded to by I'Tsing. Dr. Hoernle, however, rules him out by date for "he can not be placed earlier than the eighth century"—an assertion unsupported by any evidence whatsoever. All that he has proved is that "Accordingly it is probable that all these three medical writers (Mādhava, Dr̥ḍhabala and Vāgbhaṭa II) come in the period from the 7th to the

¹ See foot-note 3, P. 6.

² I'Tsing: Records of the Buddhist Religion. Transl. by Professor Takakusu, P. 128.

³ J. R. A. S., 1907, P. 413.

Hoernle's Osteology, Introduction, P. 10—11.

9th century A.D.¹ at no very great interval from one another," and this proof is based on the age of Vāgbhaṭa I as suggested by I'Tsing's remarks. Thus he has taken for granted what he is required to prove. He has shown that Suśruta is anterior to Vāgbhaṭa I; and Vāgbhaṭa II is posterior to him. But in trying to prove that Vāgbhaṭa I lived in the seventh century he cannot assume that Vāgbhaṭa II lived in the eighth. Another evidence adduced in support of his conclusion is the fact that the non-medical version of the list of bones of the human body as contained in the Law-book of Yājñavalkya presupposes earlier uncorrupted forms of lists of bones both in Caraka and Suśruta, and "the corrupt recension, traditionally handed down, must have come into existence at a later date," that is to say, between the date of Yājñavalkya (350 A.D.) and Vāgbhaṭa I, the latter of whom is proved to have copied from the corrupt recensions of Caraka and Suśruta. Thus the older recensions still existed in the fourth century A.D. and if we add to it the interval of time necessary for the texts to have fallen into a state of corruption, we get the early seventh century A.D. for Vāgbhaṭa I. But we must remember that there is nothing to prevent against the supposition that Vāgbhaṭa I lived before Yājñavalkya. There might have been two recensions of the texts available during Yājñavalkya's time, one corrupted and it might or might not have been the work of Vāgbhaṭa I and another true version which was availed of by the sage Yājñavalkya. And similar events have happened, as has been pointed out by Dr. Hoernle himself, in our own generation. Gaṅgādhar's recension of Caraka is a corrupted form of the text,

¹ *Ibid.*, P. 16.

while the recension given in Jībānanda's edition is the traditional text of Caraka. No critic would I think jump into the conclusion that Gaṅgādhar lived three or four centuries after Jībānanda. Again if it be true, as he contends, that Suśruta was redacted by Vāgbhaṭa I, we could easily imagine that Yājñavalkya copied his list bones from the original Suśruta and not from the redaction of Vāgbhaṭa I. So we see that the age assigned to Vāgbhaṭa I, or the seventh century A.D. can not be accepted as proved. Dr. Hoernle says : "It should, however, be understood that these conclusions regarding the date and authorship of Vāgbhaṭa I, are not put forward as established fact."

Let us recapitulate the objections that can be urged against the conclusion that Vāgbhaṭa I lived in the seventh century A.D.

1. Vāgbhaṭa I is believed by the Indian medical men to have flourished long before the Christian era. By some, he is connected with the court of Yudhiṣṭhīra, but his name is nowhere mentioned in the Mahābhārata. Ātreya, Suśruta and Vāgbhaṭa are described as the Old Triad or Vṛddhiya Trayī and they were the authorities for the Tretā, Dvāpara and Kali Yugas, respectively. It is curious to observe that Dr. Hoernle in arguing against the conclusion of Prof. Jolly that Suśruta is meant by ITsing, takes advantage of this Indian medical tradition that Suśruta flourished during pre-historic times, but does not mention the same tradition with regard to Vāgbhaṭa I, which goes against his own conclusion. On the other hand the same objection does not apply against Vāgbhaṭa II.

2. The name of Vāgbhaṭa I's book, Compendium of the

Octopartite Science, no doubt, agrees very well with the description of I'Tsing that "lately a man collected them into one bundle." But Vāgbhaṭa II's book "The best Compendium of the Octopartite Science" is equally suggestive, though Dr. Hoernle says: "it cannot prevail by the side of the more suggestive name of the rival work of Vāgbhaṭa the elder."

3. Again in arguing against Prof. Jolly, Dr. Hoernle has attached much importance to the word "lately" by which Suśruta is ruled out by date. Admitting the validity of such reasoning, it does not follow that by the word "lately" I'Tsing meant any contemporary author or any one who preceded him by a short period only. To comprehend the meaning of the sentence we must understand the word "lately" in connection with the word "formerly" used before.¹ Now the sentence "The science of medicine formerly existed in eight books" no doubt refers to the division of Āyurveda into eight parts by Brahmā and to the treatises on the different branches of Medicine by Agniveśa, Suśruta and others. These treatises are believed to be of remote antiquity, and so any later compilation may be spoken of as recent in comparison with the old treatises of unknown ages. Thus the word "lately" may refer either to Vāgbhaṭa I or Vāgbhaṭa II, but the latter author's claim to the honour becomes reasonable considering his decided posteriority to the former and so coming within the limit of the time suggested by the word "lately."

4. Again I'Tsing refers to a book which was recognised as the standard throughout India. This may refer either to

¹ J. R. A. S. 1907. P. 174.

Vāgbhaṭa I or II. But if Vāgbhaṭa I's book occupied such a position at the time of ITsing, it becomes difficult to imagine why Vāgbhaṭa II should write another work principally based on the work of Vāgbhaṭa I after a lapse of a century or so. Moreover, we find at the present time, that Vāgbhaṭa II's book, Aṣṭāṅga Hṛdaya Saṁhitā, has a wider popularity than the book Aṣṭāṅga Saṅgraha of Vāgbhaṭa I. The former has been printed many times and is widely read by the students,—so much so Vāgbhaṭa is generally known as the author of Aṣṭāṅga Hṛdaya Saṁhitā.

5. Moreover, the Arabian physician Rhazes, who is said to have lived in the ninth century (882 A.D.) in treating of the property of ginger, the common plantain or musa and other drugs, quotes from an Indian writer, whom he calls Sindaxar or Sindicara.¹ Royle says: "But in the article De Allio another Indian author is quoted, whom I have not been able yet to trace out—*Ait Sindifar* (in another place written "*Dixit sindichar*") *indianus valet contra Ventositatem.*" This Sindicara is identified with Vāgbhaṭa II of Sindh who was in his time known as a second Caraka or Cara, the syllable "ka" making no difference, as in words like "bāla" and "bālaka," both meaning a child.² We know that the Vāgbhaṭa's Aṣṭāṅga Hṛdaya Saṁhitā was one of the medical works translated by the order of Caliphs in the eighth century.³

6. The translations of the Caraka, the Suśruta and the Vāgbhaṭa occur in the Thibetan Tanjur.⁴ "George Huth,⁵

¹ Antiquity of Hindu Medicine, Page 38.

² History of Aryan Medical Science, P. 196.

³ Zeit. deut. morg. Ges. 34, p. 465.

⁴ Jour. Asiatic Soc. XXXVIII. (1835).

⁵ Zeit. deut. morg. Ges. T. (LXIX. pp. 279—284).

who has recently critically examined the contents of the Tanjur, concludes that the most recent date at which it can be placed is the 8th century A.D.”¹

So I cannot avoid the conclusion that of the three authors, Suśruta, Vāgbhaṭa I and II, to which I’Tsing’s remarks may refer, the last has probably the best claims to that reference; and the date assigned to Vāgbhaṭa I may well suit Vāgbhaṭa II i.e., “as late as the early 7th century A.D.”² and possibly still earlier.³ Again it is impossible for us to say whether I’Tsing’s remarks may not appropriately refer to other authors whose works are lost to us.

Mention should also be made of the fact pointed out by Dr. Cordier that Vāgbhaṭa is mentioned in Rājtarāṅgiṇī and his date is fixed there as 1196-1218 A.D.⁴

But the name of Vāgbhaṭa does not occur in Stein’s edition of Rāj, which is no doubt the most reliable, and so we can easily dismiss this view as untenable.

Editions.—Vāgbhaṭa I’s book Aṣṭāṅga Saṃgraha has been printed in Bombay.

Commentary.—Arunadatta—about 1220 A.D.

¹ P. C. Rāy’s History of Hindu Chemistry, Intro., P. XXIX.

² Hoernl’s Osteology, Intro., p. 10.

³ Dr. Kunte places him “at least as early as the second century before Christ,” Vide his Intro. to Vāgbhaṭa’s Aṣṭāṅga Hṛdaya Saṃhitā.

⁴ सिंहगुप्तसुतः परमवैद्वी वागभटाचार्यः काश्मीरनगरपति जयसिंहस्य प्रजापालन समये (खृः द्वादश शताब्द्याम्, शक ११८—४०) वर्तमाना आसीत्।

Quoted in Cordier’s Vāgbhaṭa et L’Aṣṭāṅgahṛdaya Saṃhitā, 1896.

See Intro. to the Vaidyakṣahdasindhu by Kavirāja Umeśandra Gupta, 1894.

VĀGBHATA II.

The next great authority in Hindu medicine is Vāgbhaṭa II, son of Siṁha Gupta, an inhabitant of Sindh.¹ His work, Aṣṭāṅga Hṛdaya Saṁhitā, the author himself states, is based on the summary of Vāgbhaṭa the elder.² In the first chapter of Sūtra Sthāna, he acknowledges the help he received from the works of Agniveśa, Hārīta, Bhela, and others.³ The fact that Caraka is not referred to here as one of the sources of Vāgbhaṭa II has been taken advantage of by some to prove the posteriority of Caraka.⁴ They conclude that Agniveśa and Suśruta wrote their works long before him, and the Agniveśa Tantra was not called by the name of, and in fact was not as yet edited by, Caraka, at the

¹

भिषग्वरी वाभट इत्यसुनमे
पितामहो नामधरीऽस्मि यस्य
सुतोऽभवत्स्य च सिंहगुप्तः
तस्याथहम् सिद्धुसु जातजन्मा ॥

Aṣṭāṅga.

² Aṣṭāṅga Hṛdaya Saṁhitā, Uttara Sthāna, Ch. XL, v. 82.

See foot note 2, p. 18.

³

ब्रह्मा स्मृत्याऽयुषी वेदं प्रजापतिमजियहत् ।
सीड्विवनौ तौ सहस्राचं सीड्विपुवादिकान्मुनीन् ॥४॥
तेऽग्निवेशादिकाले तु पृथक् तत्त्वाणि तेनिरे ।
तेभ्योऽतिविप्रकीर्णेभ्यः प्रायः सारतरोच्यः ।
क्रियतेऽष्टाङ्गहृदयं नातिसंक्षेपविसरम् ॥५॥

Aṣṭāṅga Hṛdaya, Sūtra Sthāna, Ch. I.

⁴ "It would appear also that at the time Vāgbhaṭa lived, Agnivesha's work was not called by the name of Caraka, and Suśruta had also been written. Hence it follows that Caraka's edition of Agnivesha, that is the work now called Caraka, was probably edited after Suśruta had been written."

Dutt's Materia Medica of the Hindus, Intro., p. IX.

time Vāgbhaṭa II flourished. The argument is however not conclusive ; it only shows that the Agniveśa Tantra was available to Vāgbhaṭa II in its original form. No definite results can be expected from this *argumentum ex silentio*. Again it may easily be imagined, and I think it is the right view of the question, that Caraka lived and edited Agniveśa's work long before Vāgbhaṭa, the reason of Caraka being not mentioned in Vāgbhaṭa's book, is the fact that Caraka did not usurp the authorship of Agniveśa Tantra but clearly states at the end of each chapter the real nature of his share in the authorship of his book in the following words :—“Here ends the chapter of Agniveśa Tantra as corrected and edited by Caraka.” Many modern text books of medicine have been edited and improved, though the books are still called after the original authors. Moreover to make Caraka flourish after Vāgbhaṭa II would bring him to quite modern times.

We are however arguing on false premises. Though Caraka is not mentioned in the Sūtra Sthāna of Aṣṭāṅga Hṛdaya, his name occurs in the Uttara Sthāna.¹ So there can be no doubt that Caraka's edition of Agniveśa was current in India long before Vāgbhaṭa II wrote his Aṣṭāṅga Hṛdaya Saṃhitā.

¹ यदि चरकमधीते तद्भुवं सुशुतादि
प्रणिगदितगदानां नाममाचेऽपि वाच्यः ।
अथ चरकविहीनः प्रक्रियायामखिदः
किमिह खलु करीतु व्यचिताना वराकः ॥४६॥

* * * *

ऋषिप्रणीते प्रीतिश्वसुक्ता चरकसुशुतौ ।
भेडायाः किं न पठयान्ते तस्माङ्ग्राह्यं सुभाषितम् ॥५३॥

Editions.—There are various editions of the book but the following are reliable :—

1. By Dr. Anna Moreśvara Kunte, M.D., 2 vols., Bombay, 1880; 2nd Ed., 1891.
2. By Jibānanda Vidyāsāgara, Calcutta, 1882.
3. By Vijayratna Sen Kaviranjana, Calcutta, 1885-90.
4. By Ganeś Sastri Tartevidya, Bombay, 1888.
5. In Sanskrit and Bengali, with the commentary of Arūṇadatta by Vijayratna Sen Gupta, Calcutta, 1888.
6. In Sanskrit and Guzrathi by Behicharlal Nathuram, Ahmedabad, 1889.
7. In Sanskrit and Bengali by Kāliśa Cundra Sen Gupta, Calcutta, 1890-1892.
8. In Sanskrit and Hindi by Pandit Robi Dutta, Bombay, 1890.
9. In Sanskrit and Marathi by Ganeś Kṛṣṇa Garde, Poona, 1891.
10. In Sanskrit and Bengali by *Kavirāja* Binod Lāl Sen, Calcutta, 1891-1892.

*Commentaries.*¹—

1. Sarvāṅga Sundari² by Arūṇadatta, son of Mrgāñkadatta, 1220 A.D.

¹ See Cordier's *Vāgbhaṭa et L'Aṣṭāṅgahṛdaya Samhitā*, P. 6.

² इति श्रीमृगाङ्गदत्तपुत्र श्रीमद्दरण्डदत्तविरचिताया
सर्वाङ्गसुन्दराल्यटीकाया * * * * .

2. Āyurvedadarśayana (Dinacharyā Prakarana) by Hemadri or Kamadeva, Raja of Devagiri. It is available in parts only.
3. Aṣṭāṅgahṛdayarddyota by Aśadhara Sallaxana.
4. Padārthacandrikā by Candracandana.
5. Saṅketamañjari by Dāmodara.
6. Aṣṭāṅga Hṛdayatikā by Rāmanāth Vaidya.
7. Vālaprobodhikā (Anonymous).
8. Hṛdayabodhikā , ,
9. Pāṭhya.
10. Vāgbhaṭartha Kaumudī by Hari Kṛṣṇa Sen Mullick.
11. Pradīpa by Jaśodānandan Sarkār, 1298 B.S.

VĀGBHATA III.

The author of Rasaratna Samuccaya in the Colophons at the end of each chapter identifies himself with Vāgbhaṭa II : "Here ends Book first (or so) of R.R.S. composed by Vāgbhaṭa, son of Simha Gupta, prince of physician." The salutation at the beginning of his book is strictly Buddhistic. The probable date of the book is "placed between the thirteenth and fourteenth centuries A.D."¹ "The chemical knowledge, as revealed in Vāgbhaṭa is almost on a par with that in the Suśruta," whereas the R. R. S. indicates an advanced state of that science. He quotes Rasārṇava as a source of his information ; he does not mention opium as a medicine, and the Firaṅga roga and its treatment find no place in his book.

¹ P. C. Ray's History of Hindu Chemistry, Intro., p. li.

MĀDHAVAKARA.

He is the author of the famous work on Pathology or Nidāna. His book was translated into Arabic by the order of Harun-Al-Rasid and so the most recent date that can be assigned to him is the seventh century A.D.¹ Thakore Saheb of Gondal identifies him with Mādhabācāryya, the celebrated author of Sarvadarśana Saṃgraha, the brother of Sāyana, the commentator of the Vedas.² I do not find any authority for such an assertion and here is an example of fallacious reasoning based simply on the identity of names. Mādhabācāryya and Sāyana lived in the twelfth century A.D. Mention should also be made of the view expressed by Dr. Hoernle as certain that Mādhavakara, the author of Nidāna and Vṛnda Mādhava, the author of Siddhayoga are one and the same person. He holds that Vṛnda is the real name, but he was known to the commentators as Mādhava, for his melodious diction. There is no proof given of this opinion, and we have reasons for not accepting it. However as he does not treat of surgical instruments, his work is not important to us.

CAKRAPĀNIDATTA.

Cakrapānidatta or more commonly Cakradatta in a Colophon³ has given an account of himself in his book called

¹ Jolly's Indian Medicine, ff. 5, 6, pp. 7-9.

² History of Aryan Medical Science, Ch. II, p. 35.

³

गौडाधिनाथ रसवल्याधिकारिपात्र—

नारायणस्य तनयः सुनयीऽनरङ्गात्।

भानीरतु प्रथितलोभवलीकुलीनः

श्रीचक्रपाणिरिह कच्चूपदाधिकारी ॥

Colophon in Cakradatta,

Cikitsā Sāra Saṅgraha: "The author of this work is Śrī Cakrapāṇi who belongs to the family of Lodhravalī; and who is the youngest brother of Vānu and the son of Nārāyaṇa, the superintendent of the kitchen of Nayapāla,¹ the king of Gour." This book is arranged on the plan of Vṛnda in his Siddhayoga² which again follows closely as a companion volume to Mādhava's Nidāna.³ The age of Cakradatta is about 1060 A.D.; and Vṛnda must have flourished between Mādhava and Cakrapāṇi for he quotes the former while he is himself quoted by the latter. So the probable age of Vṛnda is the ninth century A.D. Besides being a celebrated author, Cakradatta wrote excellent commentaries of Caraka and Suśruta. His extant works are—

1. Cikitsā Sāra Saṅgraha or Cakradatta. A treatise on Medicine.

¹ For the date of Nayapāla, vide Cunningham's Archaeo. Survey of India. III. P. 119; also J. A. S. LX. Pt. I. P. 46. Life of Atisa by S. C. Dās.

²

यः सिङ्गियोगसिताधिकसिङ्गियोग—

नवैव निचिपति केवलमुद्दरेत् ।

भट्टचयनिपथवेदविदा जनेन

दत्तः पतेत् सपदि मूर्द्धनि तस्य शापः ॥

Sloka at the end of the Cakradatta.

य इत्याहौ।—सिङ्गियोग इति उन्द्रकातसंयहस्य संज्ञा, तस्मिन्चित्योगमपेत्याधिका ये च सिहियोग अत्र संयहे उक्तासानधिकयोगान् तत्रैव सिङ्गियोगे निचिपति, तथा यो वा तानधिकसिङ्गियोगानितः संयहादुद्दरेत् दूरीकुर्थात्, तस्य मूर्द्धनि दैवशेन पुंसा दत्तः शापः पतेत् । कौटशेन पुंसा ? भट्टचयनिपथवेदविदा । कारिका उहृष्टीका चन्द्रटीकेति भट्टचयं, चिपथवेदः चृग्यजुःसामरूपः, तदिदा ॥

Sibadāsa Sen's Commentary.

³ हन्देन * * * * * संलिख्यते गदविनिश्चयक्रमेन ॥

2. Cakradatta or Materia Medica. It treats on drugs applicable to a number of deseases.
3. Muktābali. This treatise on the nature and properties of medicinal drugs is ascribed to Cakrapāṇi.
4. Vānumati—Commentary on Suśruta Saṃhitā.
5. Cakratattwadīpikā—Commentary on Caraka Saṃhitā.

Editions.—

1. Cakradatta or Cikitsā Sāra Saṃgraha edited by *Kavirāja Pyāri Mohan Sen Gupta*, Calcutta, 1295 B.S.
2. Cakradatta with Bengali translation by *Candrakumār Dās Kavibhuṣan*.
3. Cakradatta with Bengali translation and with commentary of *Siva Dās Sen*, by *Jaśodā Nandan Sarkār*, 1302 B.S.

SĀRĀNGADHARA.

He wrote Sāraṅgadhara Saṃgraha. It is compiled from the works of Caraka, Suśruta, Vāgbhaṭa and others.¹ It is very popular in Western India. It treats on nosology and practice of Medicine. He was the son of Dāmodara and flourished in the fifteenth century A.D.

*Edition.—*By *Kavirāja Pyāri Mohan Sen Gupta*, Calcutta, 1296 B.S.

¹ प्रसिद्धयोगा मुनिभिः प्रयुक्ता
श्विकितस्कै ये वहशीऽनुभूताः ।
विद्ययते शार्ङ्गधरेण तेषां
भुसंयहः सज्जनरञ्जनाय ॥

Commentary.—Sāraṅgadharatikā: It is a commentary on the above work by Adhamulla.

BHĀVA MIŚRA.

About 350 years ago, a compilation was made by Bhāva Miśra, son of Lataka Miśra, an inhabitant of Benares, from the most celebrated medical works and was called Bhāva Prakāśa.¹ He lived about 1550 A.D. and was considered a "Jewel of Physicians and Master of Śāstras." He mentions China root called Tob Chini² in the Vernacular as a remedy of Firaṅga roga or Syphilis³ which he describes for the first time in India. He was the first to make mention of certain drugs of foreign countries as Badhkshani Naspasi,

¹ आयुर्वेदाचिमध्यादतिमिमुनयी योगरबानि यवा-
ज्ञब्बा से से निवन्धेदधुरखिलजन व्यधिविच्छनाय ।
ततद् यथादृग्हृतैः सुवचनमण्डि भावमिश्रशिकित्सा
शास्त्रे जाद्यान्वकारं प्रशमयितुभिं सम्बिधते प्रकाशम् ॥

Bhāva Prakāśa, I. i.

इति श्रीभिश्र लटकतनय श्रीमन्मिश्रभावविरचिते
भावप्रकाशे षष्ठ प्रकरणं सम्पूर्णं ॥

Colophon at the end of Section I.

² दीपान्तरवचा किञ्चित्कीणा वङ्गिदीपिडत् ।
विवभाधानश्लवन्नी शक्तमूलविश्वीविनी ॥
वातव्याधीनपस्तारसुन्मादं तनुवेदनाम् ।
व्यपीडिति विशेषेण फिरङ्गमयनाशिनी ॥

Bhāva Prakāśa, I. i.

³ फिरङ्गसंज्ञके देशे वाहुल्ये नव घडवेत् ।
तस्मात् फिरङ्ग इत्युक्ती व्याधिर्व्याधिविश्वारदैः ॥

Bhāva Prakāśa, II. iv.

Khorasani and Parasika Vacha (Acorus Calamus), Sulemani Kharjura (date fruit of Suleman),¹ and opium.

Editions.—

1. By Jibānanda Vidyāsāgara, Calcutta, 1875.
2. By Rasik Lāl Gupta.
3. By Kāliśa Candra Vidyāratna.

Besides these books, the number of Sanskrit medical works is simply legion; many of them are daubed with fancy names and are excellent treatises on the different branches of medical science. But they are quite foreign to our purpose. I intend to publish in a separate volume short notices of the medical authors and their works, and so we need not dwell on them here.

¹ पारसौक यवानी तु यवानी सटशी गुणैः ।
विशेषात् पाचनी रुचा ग्राहिणी मादिनी गुरः ॥

Bhāva Prakāśa, I.

पारसौकवचा शुक्ला प्रीक्ता हैमवतीति सा ।
हैमवत्युदिता तद्वातं हन्ति विशेषतः ॥

Ibid.

उक्तं खसफलचौरमाफूकमहिफेणकम् ।

Ibid.

चीनाक सज्जः कपूरः कफद्रव्यकरः अृतः ।

Ibid.

खञ्जुरी गोक्षनाकारा परद्वौपादिहागता ॥

Ibid.

CHAPTER II.

HOSPITALS AND DISPENSARIES.

Before entering into our proper subject, it would not be amiss to notice here two objects—Hospitals and Anæsthetics—which are essentially necessary for the development of surgical knowledge. We know from the Edict II of Aśoka that India during his reign was studded with hospitals not only for the treatment of human beings but also for the brute creations. But even before Aśoka, hospitals flourished in India. In Caraka we can trace the germ of such an institution though it was used for rich men and did not accommodate the public.¹

¹ हृदं निवातं प्रवातैकदेशं सुखप्रविचारमनुपत्यकं धूमातपरजसामनभिगमनीयमनिष्टानाच्च
शब्द-स्पर्श-रस-रूप-गन्धानां सीपानीदूसलमुषलवर्जः स्थानक्षानभूमिमहानसीपेतं बास्तुविद्या-
कुशलः प्रशस्तं गृहमेव तावत् पूर्वमुपकल्पयेत् ।

ततः श्रीलक्ष्मीचानुरागदात्यप्रादिक्षेष्योपनिषद्वानुपचारकुशलान् सर्वकर्मसु पर्यवदातान्
सुपीदनपाचकसंवाहकीत्यापकसंवेशकौषधपेषकांशं परिचारकान् सर्वकर्मस्प्रति-
कुलान् । तथै गौत्रवादित्रीलापकश्चिकागाथाख्यायिकेतिहास-पुराणकुशलानभिराय-ज्ञानतु-
मतांशं देशकालविदः परिषद्यांशं । तथा लावकपिङ्गलशश्वरिणैनकालपुच्छकमृगमाटकी-
रक्षान् । गाज्जे दीर्घौ श्रीलक्ष्मीभनातुरां जीवदत्सां सुप्रतिविहितदृशणशरस्पानोयाम् । जल-
पाचाचमनीदकोषमणिकपिठरघटकुञ्चीकुञ्चकुञ्चशरावदर्वीकपरीपचनमन्यानचेलसूत्रकार्पासी-
र्णदीनि च श्यनासनादीनि चौपन्यस्तम्भज्ञारप्रतिग्रहणि सुप्रयुक्तातरण्णैतरपच्छदी-
पधानानि सापाश्यानि संवेशनोपवेशनं हेह्येदाभ्यङ्गप्रदेहे परिषेकानुलेपनवमनविरेचना-
स्थापनानुवासन-श्वरीविरेचनमूचीचारकर्मणामुपचारसुखानिसुप्रचालितोपधानाऽच्च श्वस्त्राखर-
मध्यमा दृशद अस्त्राणि चौपकरणार्थानि ।

धूमनेत्रं वल्लिनेत्रं चैतरवस्त्रिकच्च । कुशहस्तं तुलाच्च मानभाण्डच्च घृततेलवसामज्ज्ञौ द्र-
फाणितलवण्णम्बवीदक-मधुसुरासौवीरकतुषीदकमैरेथमेदकदधिमर्णोदधिवज्ञानग्राम्भमूचाणि च ।
तथा शालिषष्ठिकमुङ्गमाषयवतिलकुलत्यबदरमूङ्गीकापर्वकाभयामलकविभीतकानि नाना-
विधानि च स्त्रेहेदापकरणानि द्रव्याणि तत्रैवीर्वहरणानुलोमिकीभयभाज्ज्ञं संयहनीयदीप-
नीयपाचनीयीपश्चमनीयबातहराणि समाख्यातानि चौषधानि यज्ञान्यदपि किञ्चिद्ग्रापदः
परिसंख्यायीपकरणं विद्यते यत्र प्रतिभीगाणं तत्तदुपकल्पयेत् ॥

He advises us as follows:—The engineer is to erect a strong and spacious building, well-ventilated at one part, the other part being free from draughts. The scenery should be pleasing and one should feel happy to walk in it. It must not be behind any high building, nor exposed to the glare of the sun. It should be inaccessible to smoke and dust. There must not be anything injurious to our senses as regards sound, touch, taste, form and smell. There should be stairs, large wooden mortars and pestles; and there must be additional bare ground for the construction of a privy, bath-room and kitchen. The staff should consist of servants and companions. The servants should be good, virtuous, pure, fond, clever, generous, well trained in nursing, skillful in works, able to cook rice and curries well, competent to administer a bath, expert masseur¹, trained in raising and moving a patient, dexterous in making or cleaning beds, practiced in the art of compounding medicines and willing workers not likely to show displeasure to any order. The companions should be good singers and musicians, fluent speakers, well-versed in distichs, ballads, tales, history and mythology, well-acquainted with the design of a patient's nods or signals, agreeable and should have knowledge of the season and the locality. The various kinds of animals

¹ From the accounts of Megasthenes, we learn that four attendants used to massage him (Candragupta) with ebony rollers during the time that he was engaged in disposing of cases. Such an attendant (*samvāhaka*) is a minor character in the Toy Cart or little Clay Cart, drama, transl. by Ryder, in Harvard Oriental Series, Vol. IX, 1905—Smith's Early History of India, 2nd Ed., Page 122. Footnote. We also find in the Kāmandikya Nitisāra that the king is cautioned against shampooers who have the opportunity of poisoning him.

सदव्यञ्जनकर्त्तरस्तपका व्यवकासथा ।

प्रसाधका भीजकाश्च गातसंबाहका अपि ॥

should always be kept in stock such as Lāva (*Perdix Chinensis*), Kapiñjala (partridge), hares, sheep and the different kinds of deers, Ena (the black antelope) blacktailed deer, and Mrgamātrka. There should be a diary attached to the building. The cow should be good natured and healthy, and should yield profuse milk. The calves must be living. There should be stocked for them potable water and hay in a clean fold. In that building must be kept the following necessary articles :—

Water vessels, washing basins, tubs, jars, dishes, ghata, (small jars) kumbhi, kumbha (larger and smaller vessels), kundu (jug or pitcher), soraba (earthen basins), spoons or ladles, cooking utensils, churning rods, cloth, thread, cotton, wool, bedding and āsana (seats). Near them should be placed drinking vessels of gold and spittoons. The bedding should consist of a broad carpet, bed-sheet, pillows, and a bedstead. There should be collected good furnitures for beds and seats ; and also utensils and appliances for application of oleaginous medicines, heat, oil, ointment, bath and perfumeries, and for the acts of emesis, purgation, draining of the brain, injection into the rectum, defaecation and urination (*i.e.* Vastiyantra, urinal, bed-pan &c.). The blunt and sharp instruments and their accessories, well-washed mullers and whetstones of different degrees of smoothness—polished, plain or rough—should be near at hand ; the tubular instruments for fumigation, inhalation and injection into the rectum, urethra and vagina, should be available there ; and the following articles are also to be stocked :—brushes and brooms, weighing scales and weights, ghee (melted butter), oil, fat, marrow, honey, molasses, salt, wood, water, spirituous liquor formed by steeping husked grains of barley in water, or by boiling together the husks of fried māskalāya

(pulse of Phaseolous Rox.), barley and water, spirituous liquor from the blossoms of Lythrum Fruticoscence with sugar, spirit distilled from the different sorts of grains, curdled milk, rice, gruel, whey, sour liquid produced from the acetous fermentation of powdered paddy, and the various kinds of urines of animals. Different kinds of rice such as Śāli (or that reaped in cold season) and Saṣṭhika (or that grown in hot weather in low lands and reaped within sixty days of its sowing), Mudga (Phaseolus mungo), Māṣa (Phaseolus Rox.), Yava (Hordeum Vulgare), sesame (Seasamum Indicum), Kullatha (Dolichos Biflorus), plums (Zizyphus Jujube), raisins (Vitis Vinifera), Paruṣa (Grewia Asiatica), Abhayā (Chebulic Myrobalan), Āmlakī (Phyllanthus Emblica), Vibhītaka (Terminalia Bellerica) and other classes of medicaments, as oils, diaphoretics, sternutatories, cathartics, emetics, purgatives, astringents, stomachics, digestives, calmatives, carminatives and various other forms of medicines, are required for treatment. Besides these, there must be stored the antidotes to poisons caused by overdoses of medicines and other appliances likely to add to the patient's comfort.

To this may be compared the description of the Greek iatrium, which is mentioned in the Hippocratic treatise, *De Medicio*. He directs that "it should be so constructed that neither the wind nor sun might prove offensive to the patient, and goes on to enumerate the various articles which it should contain, such as scalpels, lancets, cupping-instruments, trepans, raspatories, with bandages and medicines."¹

¹ Works of Hippocrates, Syd. Soc., Vol. II, page 470, Footnote.

Suśruta gives us a list of appliances¹ required in surgical operations :—

1. Blunt Instruments.
2. Sharp Instruments.
3. Potential Cautery.
4. Actual Cautery.
5. Salākā or rods.
6. Horns.
7. Leeches.
8. Hollow bottle gourd.
9. Jāmbav-ouṣṭha [a bougie of blackstone, the extremity of which is shaped like the fruit of the Jambul tree (*Urginea Jāmbolana*)].
10. Cotton.
11. Pieces of cloth.
12. Thread.
13. Leaves.
14. Materials of bandaging.
15. Honey.
16. Ghee, or clarified butter.
17. Suet.
18. Milk.
19. Oils.
20. Tarpan.—flour of any perched grain or condensed milk etc. mixed with water to mitigate thirst.
21. Decoctions.
22. Liniments.
23. Plasters.
24. Fan.
25. Cold and hot water.
26. Iron pans, kalasi and other earthen vessels; beddings and seats.
27. Obedient, steady and strong servants.

The Lying-in-room.—Caraka says : “Before the ninth month of pregnancy, the lying-in-room should be constructed. The land should be cleaned of bones, gravels and potsherds. The ground selected should be of auspicious colour, taste and smell. The gate of the house should face towards the east or the north.² There must be a store of wood such as Vilva (Ægle

¹ अतोऽनामतं कर्म चिकीषता बैयेन पूर्णमेवोपकल्पयितव्यानि तदृयथा यन्त्रशस्त्रचाराद्धि-
ग्लाकाशङ्गजल्लौकालावूजाम्बोष्टपिचूप्रीतसूचपत्तपद्मधूष्टतवसापयस्तेलतपर्नकषायलेपनं कल्क-
व्यजनशीतीशीदकं कटाहदीनि पारकर्मणश्च हिंग्घा: स्थिरा बलवन्तः।

Suśruta Saṃhitā. I. v.

² “The best sort of ground should abound with milky trees, full of fruits and flowers ; its boundary should be of a quadrangular form, level and smooth, with a sloping declivity towards the east producing a hard sound, with a stream running from left to right, of an agreeable doonr, fertile, of an uniform

Marmeles), Tinduka (*Diospyros Embryopteris*), Inguda (*Balanites Rox.*) Bhallākaka (*Semecarpus Anacardium*), Vāruna (*Ocimum Basilicum*), Khadira (*Acacia Catechu*) or wood of other kinds said to be auspicious by a Brāhmaṇa versed in the Atharvaveda; and there must be a sufficient provision for clothes, liniments, and covers. For the pregnant woman, be careful to have a fire-place, water, pestles and mortars, a privy, a bathing place, and ovens. These should be constructed according to the science of engineering and should be pleasant with regard to the season. There should be collected clarified butter, oil, honey, different kinds of salts as rock salt, sonchal salt, and black salt, Vidañgas (*Embelic Ribes*), treacle, Kuṣṭha (*Saussurea Lappa*), Kilima (*Pinus Deodara*), Nāgara (dried root of *Zinziber Officinale*), Pippalī (*Piper Longum*), its root, Hastipippalī (*Scindaspus Officinalis*), Mandukparni (*Hydrocotyle Asiatica*), Elā (*Elettarium Cardamomum*), Lāngolī (*Gloriosa Superba*), Vāca (*Acorus Calamus*), Cavya (*Piper Cava*), Chitrāka (*Plumbago Zeylanicum*), Chiravilva (*Pongamia Glabra*), Hingu (*Ferrula Assafætida*), Sarṣapa (Mustard seeds), Lašuna (*Allium Sativum*), finely or thickly powdered rice, Kadamba (*Anthocephalous Kadamba*), Ātasi (*Linum Usitatissimum*), Vallija (*Cucurbita Pepo*), Bhurya (*Betula Bhojpatra*), Kulatha Dolichos *Uniflorus*), Maireya (a spirituous liquor from the blossoms of *Lythrum Fruticoscence*) and Āshava (Vinous fermented liquor from sugar or molasses, Rum). Also collect two pieces of

colour containing a great quantity of soil, producing water when dug to the height of a man's arm raised above his head, and situated in a climate of moderate temperature."

Manosara, Ch. I. quoted in Ram Raz's The Architecture of the Hindus,
Page 16.

stone (muller and stone slabs), two pestles, two mortars, an ass, a bullock, two sharp needles of gold and silver, two skeins of threads, sharp instruments of steel, two wooden bedsteads (*Aege Marmelos*), and wood (*Tinduka* and *Ingudi*) for easily igniting fire. The female attendants should be mothers of children, and friends and relatives of the patients. They must be fond of her, skillful in work, intelligent, jolly, laborious full of tender love for the children and a favourite of the mother.”¹

The Child's Room :—He continues—“ The engineer is to construct a room, spacious, beautiful, full of light, well-ventilated but free from draughts, strong, and free from beasts of prey, animals with fangs, mice and insects. There should be kept water, mortar and separate places should be assigned for bathing, cooking, urination and defaecation. It should suit the season of the year. The beddings, seats and covers should be comfortable and suitable to the season. Auspicious ceremonies should be performed in that room such as *homa*, expiations and presents to gods, for the proper protection of the child ; and there should be present pious old men, doctors, and devoted

¹ प्राक् चैवासप्त नवमान्वासात् सुतिकागारं कारयेदपहृतास्थिश्वर्करकपालेदेशं प्रशस्त-रूपसंग्राह्यां भूमौ प्राग्द्वारमुद्गद्वारं वा । तत्र वैवानां काषाणां तिन्दुकैङ्गुदानां भल्लात्-कानां वारुणानां खदिरानां वा यानि चानान्यपि ब्राह्मणाः शंसे युरथर्ववेदविद्वासनालेप-नाळादनापिधानसम्पूर्णेतत् तत् । वास्तु-विद्या-हृदयीर्गेनाग्रिसलिलीलुखलवर्चः स्थानस्त्रानभूमि-महानसन्मुखुद्वच । तत्र सर्पिल्लेमधुसैन्धवसौवर्चलकाललवणविड्गुड्कुष्ठकिलिमनागर-पिपलीमूलहस्तिपिपलीमखूकपर्णेलालाङ्गलीवचाचव्यचित्रकचिरविल्व-हिङ्गुसर्षप लशुनकन-कनिकानीपातसीवल्लिमभूर्जाः कुलत्यमैरेयसुरासवाः सन्निहिताः सुरः ॥ वथाश्वानी हौं दे च अहमूषले दे उलूखले खरो इष्वमश इौ च तीक्ष्णौ सूचैपिपलकौ सौवर्णराजतौ दे शस्त्राणि च तीक्ष्णायसानि दौ च वित्वमयी पर्यंज्ञी तैष्टकैङ्गुदानि काष्टन्यग्रिसम्मुखणानि स्त्रियश वह्नी वह्नशः प्रजाताः सौहार्द्युक्ताः सततमनुरक्ताः प्रदक्षिनाचाराः प्रतिपत्तिकुशलाः प्रकृतिवत्सलास्यक्तविषादाः क्षेत्रस्त्रियावीभिमता ब्राह्मणश्वायर्ववेदविदी यज्ञान्वदपि तत्र समर्थं भवेत यत्र ब्राह्मणाः ग्रूपः स्त्रियश वज्ञात्तत्काश्यम् ॥

attendants constantly. The child's bed, covers and sheets should be soft, light, pure and scented. These should always be free from sweat, dirt, worms or bugs, urine and faeces. If repeated change of new clothes be impossible, the soiled coverings should be well washed and the beddings well purified with steam and thoroughly dried before they are used again. To purify or sterilise the dress, beddings, coverings and sheets by fumigation use the following medicines with clarified butter:—Barley (*Hordeum Vulgare*), mustard seeds, linseeds, *assafœtida*, *Guggula* (*Balsamodendron Mukul*), *Vāca* (*Acorus Calamus*), *Coraka* (*Andropogon Acicularis*), *Vayasthā* (*Chebulic Myrobolan*), *Golomi* (*Panicum Dactylon*), *Jaṭilā* (*Nardostachys Jatamansi*); *Palankasā* (a variety of *Guggula*), *Aśoka* (*Saraca Indica*), *Rohinī* (*Picrorrhiza Kurroa*) and sakes' skin.....A variety of toys to please the child should be at hand and these should be coloured, light, musical, beautiful and must not be sharp pointed. They should be of such a size and shape as cannot be put into the child's mouth or do not terrify or kill the child.”¹

¹ अतोऽनन्तरं कुमारागारविधिमहत्वात्यास्थामः ॥ वास्तुविद्याकुशलः प्रशस्तं रस्यस्तमस्कं निवातं प्रवतैकदेशं दृढमपगतश्वापदपशुदंष्ट्रिमूषिकपतञ्जः सुसंविभक्तसलिलोद्यखलमूचवर्चः-स्थानस्त्रानभूमिमहानस्त्रितुसुखं यथर्तु श्वयनासानास्तरण्णसम्पन्नं कुर्यात् । तथा सुविहित-रक्षाविधानवलिमहालहीमप्रायशित्तं शुचिब्रह्मबैद्यानुरक्तजनसम्पूर्णसिति । कुमारागारविधिः ॥ श्वयनास्तरण्णप्रावरणानि कुमारस्य ऋदुलघुश्चिसुगम्भीनि स्युः । स्वेदमलजनुमन्ति मूच्पूरी-वीपीप्रस्तानि च वैज्ञेयानि स्युः ॥ असति सम्बवेऽन्येषां ताघ्न्येव च सुप्रद्वालितपीधानानि सुधूपितानि सुशुद्धशङ्काण्युपयोगं गच्छेयुः । धूपनानि पुनर्वाससां श्वयनास्तरण्णप्रवरणात्त्वं यवसर्वपातसीहिङ्गुगुरुगुलवचाचीरकवयःस्थागीलीमौजटिलापलङ्घाशीकरीहिणीसंपर्निम्बोकानि धृतसम्युक्तानि स्युः ॥ मण्यश्च धारणीयाः कुमारस्य खड्डरुगवयवधभानां जीवतामेव दक्षिणेभ्यो विषाणेभ्योऽयाणि गृहीतानि स्युः । मन्त्राद्याशौषधयो जीवकर्षभक्तौ च यान्यप्यन्वानि ब्राह्मणाः प्रशंसेयुः । क्रीडनकानि खत्तवस्य तु विचित्राणि धीषवन्त्यभिरामाणि अगुरुण्यतीक्ष्णागानि अनास्थप्रवेशीनि अप्राणहराणि अविदासनानि स्युः ॥

Suśruta directs that there should be a particular room provided for patients who have undergone surgical operations.¹ "Patients suffering from surgical diseases as inflammatory swelling, wounds &c. should, from the very commencement of their illness, confine themselves inside a clean house, situated in a wholesome locality, free from draughts and not exposed to the glare of the sun. For, in such a building, constitutional, mental and accidental diseases are not likely to occur. In that room, the bed for the patients should be soft, spacious, and well-arranged. The patient should lie down, his

¹ त्रणिनः प्रथमभेवागारमन्विच्छेत्तचाभारं प्रशस्तवास्त्वादिकं कार्यं ।

प्रशस्तवास्तुनिष्ठहि शुचावातपवर्जिते ।

निवाते न च रीगाः सुः शारीरागनुभानसाः ॥

तच्छिन् प्रथनमसम्बाधं स्वास्थीर्णं मनोज्ञं प्राक् शिरस्त् सशस्त् कुञ्जीत ।

सुखचेष्टप्रचारः सात् स्वास्थीर्णं शयने ब्रनी ।

प्राचा दिशि स्थिता देवास्तपूजार्थं नतं शिरः ॥

तच्छिन् सुहङ्गिरनुकूलैः प्रियमदैरुपास्थमानी यथेष्टमासीत् ।

सुहृदी विहिपन्त्याशु कथाभिर्णवेदनाः ।

आङ्गवासन्यन्ती वहशस्तगुकूलाः प्रियमदाः ॥

न च दिवानिद्रावश्यः सप्तात् ।

दिवासप्ताद्वाणे कर्णुर्गावाणां गौरवं तथा ।

श्वयथुञ्ब्देनारागः स्वावश्वै भश्वं भवेत् ॥

उत्थानसंवेशनपरिवर्तनचक्रमणीच्चभीषणादिषु चात्मचेष्टासप्रसन्ती ब्रणं संरक्षेत् ।

स्थानासनं चक्रमणं यानयानातिभाषणं ।

ब्रणवान् निषेवेत शक्तिमानपि मानवः ॥

उत्थानादासनं स्थानं श्वयां धातिनिषेविता ।

प्राप्तुयान्मारुताद्वेषे रुजसम्मादिवर्जयेत् ॥

गम्याणां स्त्रीणां सन्दर्शनमसम्भाषणसंस्पर्शनानिदूरतः परिहरेत् ।

head pointing towards the east, and keep there some weapon for his own protection. On such a bed, the patient can lie comfortably and turn to his sides at pleasure. He should be surrounded by his dear friends, for their sweet words relieve the pain of inflammation. The female friends, however, should be avoided and kept at a distance. He should observe strictly the orders of the surgeon as regards his food, drink and mode of living. He should have his hairs clipped and nails pared short, be pure in his person, put on white clothes and devote himself to religious duties. A light should be kept burning; and garlands of flower, weapons &c., should be provided in the room to ward off the demons. He should be cheered and inspired by pleasant stories; and the physicians and the priests should attend the patient morning and evening. Pastils made of Sinapis Nigra and Azadirachta Indica with clarified butter and salt, should be burnt in the room morning and evening for ten days continually. The inflamed part should be fanned with a *cāmar* or yolk-tail. Sleep during the day, exercise and sexual intercourse must on no account be indulged in."

Suśruta also describes the kitchen of the king thus:— "That is the proper kithehen which is built on good ground, towards an auspicious quarter, full of utensils for cooking, spacious, clean, provided with windows guarded by a network, frequented by friends, cleared well of grass furnished with a canopy, purified by auspicious ceremonies, and managed by men and women of good character. The superintendent of the kitchen should, like the doctor, be noble and virtuous. The cook and servants should be pure, noble, capable, mild, good looking, engaged in their respective duties, high-minded, should have their hairs and nails cut short, steady,

well-bathed, of subdued passion, well-dressed, obedient and have their heads well-covered."

"The doctor in charge of the kitchen should be of noble family, religious, friendly, a clever manager for getting king's food properly prepared, ever careful for his health, non-avaricious, simple, fond, grateful, good-looking, cool-tempered, well-behaved, not proud and envious, laborious, of subdued passion, forgiving, pure, of good character, kind, intelligent, not easily fatigued, always loving, well-wisher, capable, bold, clever, skillful, not unreasonably tender, provided with medicines and well proficient in the art of healing."¹

¹

कुलौनं धार्मिकं क्षिणं सुभृतं सततीत्यितं ।
अलब्दं अश्वठं भर्तं क्रातम्नः प्रियदर्शनं ॥
क्षीधपारुष्मात् सर्वं मदालस्य विवर्जितं ।
जितेन्द्रियं चमावनं गुच्छं शैलदयानितं ॥
मेधाविनमसंश्वान्तमनुरक्तं हितैषिणं ।
पटुं प्रगत्तमं निपुणं दक्षं मायाविवर्जितं ॥
पूर्वोक्तैश्च गुणैर्युक्तं नित्यं सन्निहितागदं ।
'महानसे प्रयुक्तौ वैद्य' तदियपूजितं ॥
प्रशस्तदिग्देशक्तं शुचिभार्णं महस्तुचि ।
सजालकं गवाक्षाद्य मात्रवर्गं निषेवितं ॥
विकचहृष्टसंसृष्टं सवितानं क्रातार्चनं ।
परीचित स्त्रीपुरुषं भवेच्चापि महानसं ॥
तत्राभ्यन्तं नियुक्तै प्रायी वैद्यगुणानितं ।
शुचयी दक्षिणा दक्षाः विनौताः प्रियदर्शनाः ॥
सविभक्ताः सुमनसी नौच कैश्नखाः स्थिराः ।
खाताढ़ः संयमिनः क्रतीशीषाः सुसंयुताः ॥
तस्याचाज्ञा विधेयास्त्रा विविधा: परिकर्मिण्याः ।
आहारस्थित यथापि भवन्ति प्राणिनी यतः ॥
तस्मान्महानसे वैद्यः प्रमाद रहिती भवेत् ।
माहानसिक बोद्धारः सौपौदनिक पौयिकाः ॥
भवेयुवै द्यवश्गमा ये चायन्ये तु कैचन ।
इङ्गितङ्गी मतुष्ठाणां वाक् चेष्टमुखवैकृतैः ॥

In the Kāmandakiya Nītisāra, we find the king advised to take thoroughly examined food, and to be surrounded by physicians well-versed in the science of Toxicology;¹ and again it is said that king should take his medicines, cordials, and edibles after having his medical attendants tasted them.² The king is advised to kill his enemy by weaning over his physician or by administering poisonous liquids.³

In the Mahāvāgga⁴ we find the qualities of a good patient and a good nurse described :—

“ 6. What are five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon—

When he does do what is good for him ; when he does know the limit (of the quantity of the food) that is good for him ; when he does take his medicine, when he does let a nurse who desires his good, know what manner of disease he has, or when he is getting worse that that is so, or when it is getting better that that is so ; and when he has become able to bear bodily pains that are severe, sharp, grievous, disagreeable, unpleasant and destructive to life. These are the five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon.

1

विषन्नैरुदकैः स्वातः विषन्नमनिभूषितः ।

परीचितं समश्रीयाज्ञाहृत्वाविद्धिषग्वतः ॥ १० ॥

Kāmandaka Nītisāra vii. v. 10.

2

श्रीषधानि च सर्वानि पानं पानीयसेव च ।

तन्त्रकल्पकैः समास्वाय प्राश्रीयाहीजनानि च ॥ २७ ॥

Ibid. vii. v. 27.

3

भिषमेदेन वा श्रवं रसदानेन साध्यवैत् ॥ ३० ॥

Ibid. IX. v. 70.

⁴ Mahāvāgga viii. 26, 6 & 8 (Sacred Books of the East).

8. There are five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task—when he is capable of prescribing medicines ; when he does know what (diet) is good and what is not good for the patient, serving what is good and not serving what is not good for him ; when he does wait upon the sick out of love, and not out of greed ; when he does not revolt from removing evacuation, saliva or vomit ; when he is capable of teaching, inciting, arousing and gladdening the patient with religious discourses. These are the five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task."

There is also good deal of evidence to show that medicines were distributed free to the poor and to the pious men. When Viśakhā asked for eight boons of the Buddha, she mentioned amongst them the privilege of bestowing her life long " food for the sick, food for those who wait upon the sick and medicines for the sick " and explained her reasons as follows¹ :—

"9. Moreover, Lord, if a sick Bhikkhu does not obtain suitable foods, his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the diet that I shall have provided for the sick neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Samgha my life long with diet for the sick.

Moreover, Lord, a Bhikkhu who is waiting upon the sick if he has to seek out food for himself, may bring in the food (to the invalid) when the sun is already far on his course, and he will lose the opportunity of taking his food. But when

¹ Mahāvāggā VIII, 15-9.

he has partaken of the food I shall have provided for those who wait upon the sick, he will bring in food to the invalid in due time and he will not lose the opportunity of taking his food. It was this circumstances, Lord, that I had in view in desiring to provide the Samgha my life long with food for those who wait upon the sick.

10. Moreover, Lord if a sick Bhikkhu does not obtain suitable medicines his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the medicines which I shall have provided for the sick, neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Samgha, my life long with medicines for the sick."

The Edict No. II of Aśoka clearly shows that charitable institutions were common in India, during his reign. The Edict runs as follows :—

" Everywhere in the kingdom of the king Piyadasi, beloved of the gods, and also of the nations who live in the frontiers such as the Cholas, the Pandyas, the realms of Satyaputra and Keralaputra, as far as Tambapani, (and in the kingdom of) Antiochus, king of the Greeks and of the kings who are his neighbours, everywhere the king Piyadasi, beloved of the gods, has provided medicines of two sorts, medicines for men and medicines for animals. Wherever plants useful either for men or for animals were wanting they have been imported and planted. Wherever roots and fruits were wanting, they have been imported and planted. And along public roads, wells have been dug for the use of animals and men."

We also learn from Houen Tsang's account that Śilāditya II

(610 - 650 A. D.) was inclined towards Budhism and he forbade the slaughter of living animals, built *stupas*, and "in all the highways of the towns and villages throughout India, he erected hospices, provided with food and drink, and stationed there physicians with medicines for travellers and poor persons round about, to be given without any stint."¹

He also mentions about the father of the Bhikkhu Śrutavimśatikoṭi, that "from his house to the snowy mountains, he had established a succession of rest-houses, from which his servants continually went from one to the other. Whatever valuable medicines were wanted, they communicated the same to each other in order, and so procured them without loss of time, so rich was this family."²

He also mentions charitable institutions called *Punyaśalās* as common in India. "There were formerly in this country (Tsch-kia-Takka) many houses of charity (goodness or happiness, *Punyaśalās*) for keeping the poor and the unfortunate. They provided for them medicines and food, clothing and necessaries; so that travellers were never badly off."³

Again he says : "Benevolent kings have founded here (Mo-ti-pil-lo or Matipura) a house of "merit" (*Punyaśalās*). This foundation is endowed with funds for providing choice food and medicines to bestow in charity on widows and bereaved persons, on orphans and the destitute."⁴ A similar *Punyaśalā* or hospice was in K'ei-P'an-to (Kabandha).⁵ In describing

¹ Beal's Record, Vol. I, p. 214.

² *Ibid*, Vol. II, p. 188.

³ *Ibid*, Vol. I, p. 165.

⁴ *Ibid*, Vol. I, p. 198.

⁵ *Ibid*, Vol. II, p. 303.

Multan he says: "They have founded a house of mercy (happiness), in which they provide food, and drink, and medicines for the poor, and sick, affording succour and sustenance."¹ Of Śilāditya he says: "Every year he assembled the Sramanas from all countries, and on the third and seventh days he bestowed on them in charity four kinds of Alms (*viz.*—food, drink, medicine, clothing)."²

Fa Hian (405-11 A.D.), a contemporary of Candragupta Vikramāditya, describes the charitable dispensaries in the town of Pāṭaliputra thus:—"The nobles and householders of this country have founded hospitals within the city to which the poor of all countries, the destitute, cripple and the diseased may repair. They receive every kind of requisite help gratuitously. Physicians inspect their diseases, and according to their cases order them food and drink, medicines or decoctions, every thing in fact that may contribute to their ease. When cured,—they depart at their convenience."³ Smith remarks: "No such foundation was to be seen elsewhere in the world at this date; and its existence, anticipating the deeds of modern Christian charity, speaks well both for the character of the citizens who endowed it, and for the genius of the great Aśoka whose teaching still bore such wholesome fruit many centuries after his decease. The earliest hospital in Europe, the Maison Dieu of Paris, is said to have been opened in the 7th centuries."⁴

"Upatisso, son of Buddha Das, builds Hospitals for cripples,

¹ Beal's Record, Vol. II, p. 274.

² *Ibid.*, Vol. I, p. 214.

³ *Ibid.*, Vol. I, Intro, leii.

⁴ Smith's Early History of India, 2nd Ed., p. 280.

for pregnant women, and for the blind and diseased.¹ Dhatushena builds Hospitals for cripples and sick². Buddha Das³ himself ordained a physician for every ten villages on the high road, and built assylums for the crippled, deformed and destitute."⁴

The animal Hospitals or Piñjrāpoles which still exist at Ahmedabad, Surat, and Sodepore in Bengal, and elsewhere may be regarded as the survivals of the institutions founded by the Maurya monarch. The following account of the Surat Hospital in the 18th century is from the pen of Hamilton:—

"The most remarkable institution in Surat is the Banyan Hospital, of which we have no discription more recent than 1780. It then consisted of a large piece of ground enclosed by high walls, and sub-divided into several courts or yards for the accommodation of animals. In sickness they were attended with the greatest care, and here found a peaceful assylum for the infirmities of old age.

"When an animal broke a limb, or was otherwise disabled, his owner brought him to the Hospital, when he was received without regard to the caste or nation of his master. In 1772 this hospital contained horse, mules, oxen, sheep, goats, monkies, poultry, pigeons, and variety of birds; and also an aged tortoise, which was known to have been there seventy-five years. The most extraordinary ward was that appropriated for rats, mice, bugs, and other noxious vermins for whom suitable food was provided."⁵

¹ Mahāwanśo, p. 249. ³ *Ibid*, p. 245.

² *Ibid*, p. 256.

⁴ Cunningham's Bhilsa Topes, p. 54, foot note.

⁵ Hamilton's Description of Hindustan (120) Vol. I, p. 718, quarto ed., Crooke. Things Indian, Art. Pinjrapole, (Murray 1906).

We quote here from Hemādri the opinions of the sages and the Purāṇas as to the merit of the founder of a hospital¹ :—

Visvāmitra.

There is no gift more precious than the gift of cure ; therefore it should be given freely to the sick to augment one's good fortune. He who gives medicines, diet, food, oil for smearing and shelter to the sick, becomes free from all diseases.

Samvartta.

The giver of medicines, oleaginous remedies and food for the cure of the sick, becomes free from all diseases, happy and long-lived.

Agastya.

Those who give rice and medicines freely attain happiness, being free from disease.

Saura Purāṇa.

He, who gives medicines to the sick to cure their diseases always remains healthy, long-lived and happy.

¹ अथ आरोग्यदानं ।

तचारीग्यदानन्ताव दुच्यते ।

आहौ विश्वामित्रः ।

आरोग्यदानात्परमं न दानं विद्यते क्वचित् ।

अतीदेयं रुजाचार्नामारोग्यं भाग्यहस्तये ॥

अौषधं पथ्यमाहारं तैलाभ्यङ्गप्रतिश्रयं ।

यः प्रयच्छति रोगिणः सभवेद्याधिवर्जितः ॥

संवर्त्तः ।

अौषधं स्तेह-माहारं रोगिणां रोगशालये ।

ददानी रोगरहितः सुखी दीर्घायुरेव च ॥

Nandi Purāna.

The high-souled man who gives the Brahmins collyrium in charity to cure the diseases of the eye, goes to the Sun (after death) and becomes free from eye deseases, fine-looking and fortunate.

Good health is a step to the acquirement of religious merit, wealth, pleasure and final emancipation, and so the man who bestows cure to the sick and also he who erects a hospital equipped with good medicaments, dresses, learned doctors, servants and rooms for students, always gain them. The doctor should be well-versed in the religious treatises, experienced, familiar with the actions of medicines, a discriminator of the colour of the roots of the herbals and well-acquainted with the

च्यगस्त्यः ।

अद्वौ-वधप्रदातारः सुखं याति निरामयाः ।

सौर पुराणे ।

रीगिष्णो रीगशान्त्यर्थमौषधं यः प्रथच्छति ।

रोगहीनः स दीघांशुः सुखी भवति सर्वदा ॥

नन्दि पुराणे ।

अज्ञनं यी नरोदद्यादक्षीवर्याधिनिवृत्तये ।

विप्राय स पुमान् याति सूर्यलीकं महामतिः ।

आरोग्यनयनी दिव्यः सुभगी जायते नरः ॥

तस्मिन्ब्रेव पुराणे ।

धर्मार्थकाममीक्षाणा आरोग्यं साधनैर्युतः ।

अतखारोग्यदानेन नरो भवति सर्वदा ॥

आरोग्यशालां कुरुते महीषधपरिकृदाः ।

विदधवैद्यसंयुक्तां मृत्यावस्थसंयुतां ॥

proper season of raising them from the ground, well-trained with the qualities of the juices, (their strength and actions), scali rice, meat and medicaments, trained in compounding medicines, one who knows well of the physique of men by intelligence, one who knows the temperament and the qualities of the diet, a pathologist who is not idle, well acquainted with the remedial agents for the premonitory signs and sequelæ of diseases, proficient in the requirements of time and place, well-read in the medical text-books—the Ayurveda with its eight divisions and an expert in curing diseases by domestic remedies (prepared from handful of common ingredients).

The pious man who erects such a hospital in which the services of good physicians of this nature are retained, becomes celebrated as the virtuous, the successful and the intelligent

वैद्यसु शास्त्रवित् प्राङ्गी दृष्टौषधपराक्रमः ।

चौषधीमूलवर्षज्ञः समुद्धरणकालवित् ॥

रसवीर्यविपाकज्ञः शालिमासौषधीगणे ।

योगविहेनिना देहं यो धिया प्रविशेहुधः ॥

धातुपथ्यमयज्ञश्च निदानविदतन्द्रितः ।

व्याधीना पूर्वलिङ्गज्ञसदुत्तरविधानवित् ॥

देशकालविधानज्ञश्चिकित्साशास्त्रवित्तथा ।

अष्टाङ्गायुर्वेदवेचा मुष्टियोगविधानवित् ॥

अष्टावङ्गानि आयुर्वेदस्य ।

यथाभ्यत्यं शालाक्य कायचिकित्सा भूतविद्या कौमारभृत्यमगदतन्त्र रसायणतन्त्र वाजी-
करणतन्त्रमिति सुशुतीक्रानि ।

एवं विधः शुभी वैद्यो भवेद्यचाभियोजितः ।

आरोग्यशालामवन्तु कुर्थाद्योधर्मसंशयः ॥

स पुमान् धार्मिकी लीके स क्रतार्थः सबुद्धिमान् ।

सम्यग्मारोग्यशालामौषधैः स्वेहपाचनैः ॥

man in this world. If in such a hospital the kind-hearted man can cure a single patient of his maladies by simple medicines, oleaginous remedies and compounds of medicinal decoctions, goes to the Brahma's residence with his seven generations upwards. The rich and the poor acquire religious merit in proportion to the amount of riches they possess ; where would the poor man get a hospital and a young physician to cure his diseases ? The man secures the eternal regions mentioned before by rendering the sick healthy by the use of roots to some and by good rubbing (with external applications) to others. He who cures the sick suffering from an increase or decrease of the Air, the Bile and the Phlegm by simple remedies, he too goes to such blessed regions (after death) as are secured by those who perform many religious sacrifices (Yajñas).

व्याधिनं विद्वनी कृत्य अप्येकं करुषायुतः ।
 प्रथाति ब्रह्मसदनं कुलसप्तकसंयुतः ॥
 आज्ञी विचानुसारेण दरिद्रः फलभाग् भवेत् ।
 दरिद्रस्य कुतः शाला आरोग्याय भिषग्युवा ॥
 अपिमूलेन कैनापि मईनादैरथापि वा ।
 स्वस्थीकृते भवेन्नर्त्ते पूर्वोत्तं लीकमव्यर्थं ॥
 वात-पित्त-कफाद्यानां चया-पचयभेदिनां ।
 यस्तु स्वस्थायुपादैन सीचयेत् व्याधिपीडितान् ॥
 सीपि याति शुभान् लीकान् अवायान् यज्ञयाजिभिः ।

स्कन्दपुराणे ।

आरोग्य शालां यः कुर्यात् महावैद्यपुरखृतां ।
 सर्वोपकरणीपितां तस्य पुण्यफलं शशु ॥
 धर्मा-र्थ-काम-सीचाद्यामारोग्यं साधनं यतः ।
 तत्त्वादारीग्य दानेन तदृतं स्याच्चतुष्टयं ॥
 अथैकमात्रं विद्वांसं स्वस्थीकृत्य प्रयत्नतः ।
 प्राप्नोति सुमहतम्पुण्यमनन्तं च्छवर्जितं ॥
 ज्ञानयोगरतं शानं रोगात्तं शिवयोगिनं ।
 यः स्वस्थं कुरुते सीपि सर्वदानफलं लभेत् ॥

Skandapurāna.

Hear, the amount of religious merit secured by a man who erects a hospital containing all the necessary articles (of treatment) and in which are engaged eminent physicians by reward. As good health is the means of attaining religious merit, wealth, pleasure and final emancipation, therefore, he by rendering the sick healthy, gives these four blessings.

By carefully curing a learned man of his sickness great merit is secured, which is eternal and indestructible. He too who cures a sickman who is calm and absorbed in meditation of Siva and knowledge, attains the virtue of all kinds of gifts. Bramhā, Visnu, all the gods, diseases, relatives and kings—they are obstacles to yoga but not to those who perform it (yogi). Whatever merit is obtained by the great, by supporting the sick Brāhmans (priests), Kshatriyas (warriors), and Biṭh (cultivators) and Sudras (servants), can not be obtained by the performance of all the great Yajñas (religious ceremonies). As even the gods can not reach the end of the

ब्रह्मा विष्णुः सुराः सर्वे व्याधयः सजना लृपाः ।
 योगस्यैते महाविद्या व्याधयस्ते न योगिनां * ॥
 ब्रह्म-चविद्य-विट्शद्रान् रोगात्तान् परिपाल्य च ।
 यत्पुरुणं महदाप्रीति न तद्वर्तमहामख्यैः ॥
 आकाशस्य यथा नान्तः सुरैरप्युपलभ्यते ।
 तद्वारीग्यदानस्य नान्तीवै विद्यते क्वचित् ॥
 पुरुषेनानेन महता गत्वा शिवपुरं नरः ।
 मीदते विविधैर्भौगर्विभानैः सर्वकामिकैः ।
 एकविश्वत्कुलीपेतः सभूत्यः परिपालितः ।
 आत्मे शिवपुरे ज्ञावद्यावदाह्वतसंपूर्वं ॥
 ततः स्वधर्मशैषण संप्राप्तः प्रयतः सदा ।
 ज्ञानमुत्पद्यते तस्य रुद्रेभ्यः परिचारकः ॥

* स्वेन योगिनामिति वा पाठः ।

firmament, so there is no end (to the merit) of the gift of cure. By this great merit, the man reaching the region of Siva enjoys himself by soaring in a balloon which can go to the various desired directions. With his twenty-one generations upwards and surrounded by his servants, he stays in the Siva's realm so long till deluge does not occur. There, after the lapse of his merit, the devoted servant acquires knowledge from Siva.

Abandoning this world by knowledge, abiding by the prayers to Siva, and casting away this body as a straw, he reaches beyond the limits of sorrow. Being freed from all sorrows, becoming pure, all-knowing and self-sufficient, and absorbed in his ownself, they are called the Liberated. Therefore to mitigate the diseases, the sick should be well nursed; the great sages should especially be attended to even by the sacrifice of one's body or riches. The wise must not irritate the weak patients, and they like the preceptors should be rescued constantly from sins. He who relieves the sick, by taking them under his care, reaches the other bank of this ocean of world.

ज्ञानादिरक्तः संसाराच्छिवधानमुपार्श्वतः ।
 सदैर्ह दृश्यवत्तराक्ता सर्वदुःखान्तमाप्नुयात् ॥
 समस्तदुःखनिर्मुक्तः शुद्धैः स्त्रामव्यवस्थितः ।
 सर्वज्ञः परिपूर्णश्च मुक्त इत्यभिधीयते ॥
 तत्पाद्गीगपवर्गार्थं रीगार्त्तं समुपाचरेत् ।
 विशेषणं तु योगीन्द्रं शरीरेण धनेन च ॥
 रीगिणी नीडिजेत् प्राज्ञी दुर्बलानपि सर्वदा ।
 तान् पापाङ्गुरुवन्नित्यमेवन्सर्वः प्रवर्चते ॥
 योगुग्छौतमात्मानं मन्यमानी दिने दिने ।
 उपसर्वेत रीगार्त्तस्तीर्थस्तेन भवार्णवः ॥

इत्यारोग्यदानं ।

Hemadri's Caturvarga, Cintamoni, Dāna Khaṇḍam.
 Asiatic Soc. Ed. Ch. XIII, P. 891—95.

After these proofs, the statement of Mr. Ameer Ali that “the Arabs invented chemical pharmacy, and were the founders of those institutions which are now called dispensaries”¹ can not be accepted as correct.

DISPENSARIES.

As regards dispensaries, Suśruta advises the physician to construct his dispensary in a clean locality; and the building should face towards some auspicious direction as the east or the north. He says:—“The medicines should be kept in burnt earthen pots arranged on planks supported by stakes or pins”.² This is still the method of storing medicines used by the *Kavirājas*. Dallvāṇa explains the passage thus:—“The medicines should be kept in pieces of cloth, earthen pots, wooden pots and Šaṇiku (kilaka).”³ The former explanation is plausible for it is impossible to imagine how a kilaka or stake can be a container of medicine, unless it is implied as a point of support for hanging the medicine vials from it.

Dr. Heyne (1814) thus describes the ancient dispensaries of the Hindus: “The place in which medicines are kept should

¹ History of the Saracens p. 262, 1899.

² श्रीतम्भज्ञाएङ्गफलकशङ्कुविन्यस्तभेषजं
प्रशस्तायां दिग्मि शृचौ भेषजागारमिष्टते ॥

Suśruta Saṁhitā. I. xxxvii.

³ गृहीतौषधसंस्थापनोपायं दर्शयत्राहः,—झीतेति । झीतः कर्पटखण्डं, मृदा भाण्डं, मृतभाण्डं । फैलकं पट्टकं इति पुस्तकान्तरे पाठः, शङ्कुः कौलकः, एतेषु झीतादिषु विन्यक्तं धृतं भेषजं यस्मिन् गृहे तत् भेषजागारं भेषजगृहमिष्टते इति सम्बन्धः । प्रशस्तायां दिग्मि पूर्वस्यामुत्तरस्यां वा, शृचौ देशे अस्मिन् भूमिप्रविभागीयाभ्यादि, निवन्धेषु व्यत्ययैन न पाठी दृश्यते । अस्माभिस्तु उड्जकमरीत्यैव पाठी लिखित इति सर्वावयवसाध्येष्वित्यादि यावत्रवं द्रव्यं पुराणत्वेति पाठं केचिदाचार्या न पठन्ति ॥

be clean, dry, and not accessible to rats, white ants or dust. The drugs ought to be put in nets, or large pots, the mouth of which must be tied over with a piece of cloth, and suspended in a room. Fire, smoke and water must be kept at a distance.

The house in which medicines are stored, should be neither in too high nor too low a situation, and it should not be far distant from places in which medicines may be collected. Its front should face either the south or the north, with a convenient *viranda* before the door of the same side.

The necessary apparatus for mortars, scales, &c., must be kept in a place in the wall that has been consecrated for that purpose by religious ceremonies."

After describing the different classes, and members composing each class, of medicines, Suśruta continues: "The wise physician should collect and classify these medicines, and with them prepare external applications, infusions, oils, ghee, syrups, &c., as required for derangement of a particular humour. The medicines should be carefully preserved in all seasons, in rooms free from smoke, rain, wind and dust. The medicines should be used singly, or in combinations of several medicines of a class, or of an entire group, or of more than one group, according to the nature of the disease, and the extent of derangement of the humours."¹

¹ एभिलेपान् कवायांश्च तैलं सपींषिपानकान् ।

प्रविभज्य यथान्यायं कुर्वीत मतिमान् भिषक् ॥

धूमवसीनिलक्ष्मेदैः सर्वत्तुष्वनभिद्गुते ।

ग्राहयित्वा गृहे च्यस्येविधिनौषधसंग्रहं ॥

समौत्त्वं दीषभेदाश्च गणान् भिन्नान् प्रवीजयेत् ।

पृथग्जिथाण् समस्तान् वा गच्छं वा व्यक्तसंहतं ॥

ANÆSTHETICS.

In the medical text books of the Hindus, there is no mention of a general anæsthetic, from which we can infer that it was unknown in those ancient days. There are, however, many indications to show that the earlier surgeons felt the necessity of such an agent to produce insensibility to pain. Both Caraka and Suśruta mention the use of wine to produce the desired effect. Caraka says: "After extraction of a dead fœtus before the full term of pregnancy, wine should be prescribed to her, for that will improve the condition of her uterus, make her happy and alleviate the pain of the operation."¹ Suśruta, however, distinctly lays down that "wine should be used before operation to produce insensibility to pain." He again remarks: "It is desirable that the patient should be fed before being operated on. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient, who has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation."²

The use of certain drugs to produce anæsthetic effects was well known to the ancient Greeks and Romans. Dioscorides

¹ व्यपगतगर्भशल्यान् स्त्रियमामगर्भं सुराशीखनरिष्टमधुमदिरासवानामन्यतममये सामर्थ्यतः पाययेत गर्भकीषविशुद्धार्थमर्त्तिविक्षरणार्थं प्रहृष्टस्यार्थच ॥

Caraka Samhitā, IV, viii.

² प्राक्शस्त्रकर्मणश्चेष्ट भीजयेदातुरं भिषक् ।
भद्यपं पाययेन्मयं तौच्छं योद्वेदनासहः ॥
न मूर्छत्यन्नसंयोगान्मतः शस्त्रं न बुध्यते ।
तथादवश्यं भीजत्वं रीगेषूतेषु कर्मनि ॥
प्राणी ह्याभ्यन्तरी नृणां वाह्यप्राणगुणान्वितः ।
धारयत्विरीधेन शरीरं पाच्चभौतिकं ॥

Suśruta Samhitā, I, xvii.

mentions Mandragora. (*Mandragora Atropa*) to have been employed internally as a hypnotic and anaesthetic. Pliny (32-79 A.D.) in his Natural History mentions that this anaesthetic was also used by inhalation ; and this fact is corroborated by Galen, Arætæus, Celsus and others. The Arabian physicians also used it. The Chinese surgeons still use some powder (Indian hemp probably) to throw their patients into profound sleep. In the 13th century Theodoric (died 1298) described the "spongio somnifera" the vapours raised from which were capable, when inhaled, of setting patients into an anaesthetic sleep, thus inducing insensibility to the agony and torture of a surgeon's knife. Baptista also mentions his "Pomum somniferum", to be made with mandragora, opium, &c. The Hindus also inhaled the fumes of burning Indian hemp as an anaesthetic at a period of great antiquity. As early as 927, A. D., they also knew drugs which they employed for the same purpose, for Pandit Vallāla, in his *Bhoja Prabandha*, alludes to a cranial operation performed on the King Bhoja after he was rendered insensible by some drug called Sammohinī (producer of unconsciousness). Another drug is also mentioned, Sañjibanī (restorer to life), by which he soon regained consciousness after the operation had been finished.¹

¹ तत्सावपि राजानं सोहृच्येन सीहयित्वा शिरःकपालमादाय तत्करीटिकापुटे स्थितं शफरकुलं गद्धीत्वा कथिंश्चिन्नाजने निक्षिप्य सन्धानकरण्या कपालं यथावदारच्य उद्घावन्ता च तं जीवयित्वा तस्मै तद्दर्शयताम् ।

CHAPTER III.

MATERIALS OF INSTRUMENTS.

IRON AND STEEL.

In the R̄gveda, *ayas*, (Latin *aes*), next to gold, is the metal most often referred to. *Ayas* often stands as a generic name to mean simply "metal," though in later works it signifies iron as a rule. The mention of dark and red *ayas* in the Atharva-veda indicates a distinction between iron and copper or bronze. The surgical instruments of the Hindus are recommended generally to be made of iron; but Suśruta allows other suitable material when iron of good quality is not available.¹ He says: "A wise surgeon should get the instruments made of pure iron and with sharp edges by an expert blacksmith who is skilful and experienced in his craft."² The use of impure iron as a material for surgical instruments, he deprecates as a defect and advises the surgeons not to rely on such instruments.

The Hindus were acquainted with steel and they knew how to turn out steel of fine quality from a pure iron ore. Nāgarjuna, the well known Buddhist chemist, wrote a scientific

¹ तानि प्रायश्चो लौहानि भवन्ति तत्प्रतिष्ठपकाणि वा तदलाभे ।

Suśruta Saṃhitā. I. vii.

² शस्त्राखेतानि भविमान् शुद्धशैक्षायसानि तु ।
कारयेत् करणैः प्राप्तं कर्म्मारं कर्म्मकोविदं ॥

Ibid., I. viii.

treatise on steel and iron.¹ Śibodāsa in his commentary on Chakrapāṇi quotes Patañjali as an authority on the subject.² In the Dhanurveda, Viracintāmaṇi, Śāraṅgadharapaddhati and Lohārnava, steel as a material of sword has been described and classified.

Dr. Mitra quotes some references³ about the knowledge of iron possessed by the ancient Hindus from the R̄gveda. He finds that "swords (II. 156), spears (IV. 25), javelins (II. 292), lances (I. 774), (IV. II. 288) and hatchets (I. 120) are frequently mentioned; and these weapons were bright as "gold" or golden (IV. 19), "shining bright" (I. 175), "blazing" (IV. 93), "sharp" (IV. 113) and "made of iron" (I. 226); they are "whetted on a grind stone" (II. 36) to improve their keenness (I. 150), and "polished to enhance their brightness" (II. 326)....."According to Nearchus, King Porus gave 30 lbs of steel to Alexander as the most precious present he could offer."

Royle also remarks⁴: "Working in metals they have long been famous for: their steel acquired so great celebrity at an

¹ नागार्जुनो मुनीन्द्र शशास यज्ञोऽशास्त्रमतिगहनम् ।

तस्यार्थस्य चृतये वयसेतदिशदादर्हर्वूमः ॥

Cakradatta, Rasāyanādhikāra.

² अर्चयिता विधानेन हेरम् गुरुभास्तरौ ।

लीकपालान् यहांशैव चेत्पालानथौषधम् ।

आदित्यदेवताशेषा धन्वन्तरी-पतञ्जली

दद्याह लिङ्ग सर्वेभ्यो नानाभचोपचारतः ॥

Quoted in Śibodas's commentary on Louhamārana-

Vidhi in Cakradatta.

³ Dr. R. L. Mitra's Indo-Aryans, Vol. 1, P. 301. See Wilson's R̄gveda.

⁴ Royle's Antiquity of Hindoo Medicine, Pp. 46-7.

early period, as to have passed into a proverb among the Persians, where *fouladee hind* indicates steel of the best quality; and *juwabee hind*, an Indian answer, means a cut with a sword made of Indian steel."

COPPER.

Pure copper was also used as a material of instruments; and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. A copper probe for applying antimony to the eye has been found in the excavations of Bijno^r and another in the Bihat excavations. Cakradatta¹ advises us to use a copper probe for the application of *lekhana* collyrium; and Suśruta mentions a copper needle in the operation for re-clination of cataract.²

TIN.

Tin was also used as a material of blunt instruments. Suśruta mentions plates of tin to surround a tumour and to protect the healthy parts, before the application of actual cautery.³ Such plates are recommended to be made of tin, or lead, or copper, or iron.

LEAD.

Tubes of lead were used for purpose of fumigation. Probes made of lead were used for application of collyrium. The use

¹ प्रशस्ता लेखने तामी रीपने काललीहजा ।

Cakradatta, Añjanadhi�āra.

² तामायसौ शतकौम्भी श्लाका स्यादनिन्दिता ।

Suśruta Saṁhitā, VI. xvii.

³ अखावश्चिद्दे छमिभिः छते च लिखेत्तीऽयि विदधीत पशात् ।

यदत्यमूलं वपुतामसीस पद्देः समावेष्य तदाथसैर्वा ।

चाराग्निश्लाष्ट सक्रद्विदध्यात् प्रानाणहिंसनं भिषग्प्रमत्तः ॥

Suśruta Saṁhitā, IV. xviii.

of lead plates to surround tumours before application of actual cautery has been noted above.

BELL-METAL.

The use of bell-metal—an amalgam of zinc or tin and copper, 25 parts of the former with 75 parts of the latter,—as a material of probes for applying collyrium, is mentioned by Suśruta.¹

GOLD AND SILVER.

Gold was known to the Hindus from the remote antiquity; and among the metals, it is the one most frequently² mentioned in the R̄gveda. Silver was perhaps unknown during the earlier Vedic age, from its name being not mentioned in the R̄gveda. But no conclusion can safely be drawn from this argument³. We find, however, gold, silver, and other precious

¹ सौवर्णं राजतं शार्ङ्गन्ताम् वैदूर्यकांसजं
आयसानि च यीज्यानि शलाकाश्च यथाक्रमं ॥

Suśruta Samhitā, VI. xviii.

² “निक्ष यीव”

R̄gveda, 5 Mandala, 19 Sūkta.

“निक्षेन सुवर्णं न अलङ्कृता यीवा” ।

Sāyana.

अश्वः न हृष्यावान् ।

Ibid. 4 Mandala, 2 Sūkta.

“सुवर्णं निर्मित कव्यावान् अश्वः” ।

Sāyana.

“A horse with golden caparisons”—Wilson.

³ “एनीं रथिं” ।

R̄gveda, 5 Mandala, 33 Sūkta.

एनवर्णा श्वेतवर्णा रथिं धनं ।

Sāyana.

“Query, if silver money be intended”—Wilson.

stones mentioned as materials of instruments in the medical books. Gold and silver vessels and plates are often described in Sanskrit literature.¹ Suśruta mentions the use of drinking cups made of gold, silver and precious stones.²

Caraka, amongst other things necessary for a lying-in-room, mentions two needles of gold and silver.³ To cut the navel-cord of the new-born child, he recommends a knife made of gold, or silver, or iron.⁴ In the Manusamhitā⁵ we find : "Before the section of the navel string, a ceremony is ordained on the birth of a male; he must be made while sacred texts are pronounced, to taste a little honey and clarified butter from a golden spoon."⁶ A golden needle is mentioned by

¹ सूवर्णकृप्यशङ्खाश्म शुक्रिं रत्नं मयानि च ।
कांस्याय स्तावं रैत्वानि एषुसीस मयानि च ।
निलेपानि विशुद्धान्ति कौवलेन जलेन तु ॥

इति ब्राचे ।

² सौवर्णे राजते तामे कासिग्र मणिमये तथा
पुष्पावतंसं भौमे वा सुगन्धि सलिलं पिवेत् ॥

Suśruta Samhitā, I. xlvi.

³ * * * तीक्ष्णौ सूचीपिपलकौ सौवर्णं राजतौ द्वे शस्त्राणि च तीक्ष्णायसानि ।

Caraka Samhitā, IV. viii.

⁴ नाभिवस्नात् प्रभृति हितादाहुतमभिज्ञानं क्रत्वा छेदनावकाशसर इथीवन्तरयोः
श्लेष्ट हृत्वा तीक्ष्णेन रौक्षराजतायसार्ना छेदनानामन्यतमैनीर्द्धधारेन छेदयेत् ॥

Ibid.

⁵ प्राड् नाभिवर्धनात्युंसी जातकर्म विद्धीयते ।
मन्त्रवत्त्राश्वनं चासप्र हिरण्यमधुसंपिणाम् ॥

Manusamhitā, II. 29.

⁶ Manusamhitā (ch. II. V. 29, Jones's trans.)

Suśrūta for pricking the bulb of Soma plant to extract its juice.¹ To cure trichiasis, Cakradatta mentions a needle cautery of gold.² For destroying the hair follicles, he advises us to pass the hot needle into them as soon as the eyelashes are removed by epilation. In the Yogaratnākara, is mentioned a cautery of gold, to burn the fistulous track round the anus.³ Śāṅgadhara mentions silver or coral pots for keeping medicated snuffs,⁴ and gold and silver tubs for immersing patients in medicated lotions.⁵

HORN.

Horns of animals are mentioned as suction-apparatus. For

¹ * * * * सोमकन्दं सुवर्णसूचादिविदर्थं पद्मोग्नियात् सौवर्णं पातेऽज्ञलिमात् * * * *

Suśruta Saṃhitā, IV. xxix.

² प्रबृज्जान्तर्मुखं रीम सहिष्णीरुद्धरच्छनैः ।

सन्दर्शनोङ्गरेहृष्ट्यां पञ्चरोमाणि तुङ्गिमान् ।

रचन्नच्चि दहेत् पच्चा तप्तहृमश्लाकया ।

पञ्चरोगी पुननैव कदाचिद्द्रोमसम्भवः ॥

Cakradatta. Netraroga Cikitsā.

³ अपानभार्गपिठिकां दहेत् स्वर्णश्लाकया ।

अग्रिप्रतमया पश्चात् कुर्यादग्निव्रणक्रियाम् ॥

Yogaratnākara, p. 347.
(Anandāśram Series).

⁴ कीणमच्छन्नधारच्च हेमतारादिशक्तिभिः ।

शुक्रया वा पात्रे युक्रया वा झातैर्ब्बा नस्यमाचरेत् ॥

Śāṅgadhara Saṅgraha, III. viii.

⁵ सौवर्णं राजतं वापि ताम्रमायसञ्चादारुजं ।

कोष्ठकं तत्र कुञ्बीतोळ्क्राये षडनिशदङ्गुलं ॥

Ibid, III. ii.

this purpose, the horn of a cow is recommended.¹ A probe made of horn is advised to be used for applying collyrium. Suśruta mentions goat's horn to be used as a container of medicine.² He also recommends for this purpose vessels manufactured out of horn.³ Similarly Caraka advises us to keep medicines in the lamb's horn.⁴ Tubes of Vasti-yantra (clysters) are often described to be made of horn.⁵

BONE AND IVORY.

Vāgbhaṭa II describes the aṅguli-trāṇaka or finger-guard to be made either of wood or ivory.⁶

¹ “चुषणे”, विष पूयादा चूषण निमित्तं शरीरेषु युज्यते यत्, “शङ्क” गवादि भवं शुषिर् शङ्कः * * * *

Vāgbhatārtha Kaumudi, I. xxv.

² चुर्णाञ्जनं कारयिला भाजने मेषशङ्कं जे ॥

संस्थाप्योभयतः कालमञ्जयेत् सततं द्रुधः ।

Suśruta Saṃhitā, VI. xv.

वंशे वा माहिषे शङ्के स्थापयेत् शोधितं रसम् ।

Rasendra Cintāmaṇi, IX.

³ एतच्चूर्णाञ्जनं श्रेष्ठं निहितं भाजने शुभे ।

दन्तस्फटिकवैदूर्यं शङ्कशैलासनोङ्गवे ।

शातकुम्भेऽथ शाङ्कं वा राजते वा सुसंखते ॥

Suśruta Saṃhitā, VI. xix.

⁴ सिद्धः शैलासने भाष्टे मेषशङ्के च संस्थितः ॥

Caraka Saṃhitā, VI. xxvi.

⁵ विमुद्रासं विखण्डात्वा धातुजां काटजां तथा ।

षड्ङुलौस्यां गोपुच्छां नाडौं युज्जात् विहस्तिकां ॥

Sārṅgadhara Saṃgraha, III. ii.

⁶ अङ्गुलि वाणकं दान्तं वार्चं वा चतुराङ्गुलं ।

Aṣṭāṅga Hṛdaya. I. XXV,

WOOD.

To apply vapour-bath, Śāringadhara mentions tubes made of wood or metal.¹ Wooden Tubes for injections were also used.²

STONE.

Śāringadhara says: "The collyrium probes should be made either of stone or metal".³ For compounding medicines, stone *khal* or mortar and pestles are mentioned. A big stone slab with a muller is recommended to be used for grinding dry or fresh vegetable medicines. In extracting the Soma-juice, two slabs of stone are mentioned in the R̄gveda.⁴

EXECUTION.

The execution of the instruments is said to have been all that can be desired. Suśruta says⁵: "They should be made just of the proper size with their ends rough or polished; they should be also strong, well-shaped and capable of a firm grasp." Again he continues: "When an instrument (has been selected) of

¹ नेत्रानि धातुजान्वाहुर्नवं वंशादिजान्वपि ॥

Śāringadhara Saṅgraha, III. ix.

² नेत्रं कार्यं सुवर्णादिधातुभिष्ठृचवेणभिः ।

नलैद्वैखैविषाणायैः मणिभिर्यां विधीयते ॥

Ibid, III. v.

³ सुखयोः कुण्डिता श्लक्षा श्लाकाढाहुलोन्मिता ।

अश्मजा धातुजा वा स्वात् कलायपरिमङ्गला ॥

Ibid, III. xiii.

⁴ R̄gveda. 10 Mandala, 76, 94 & 175 Sūktas.

⁵ समाहितानि यन्ताणि खरस्त्रमसुखानि च ।

सुट्टानि सुखपाणि सुखहाणि च कारयेत् ॥

Suśruta Saṅhitā, I. vii.

a fine make and with an edge keen enough to divide the hairs on the skin, and when it has been firmly grasped at the proper place, only then it should be used in any surgical operation”¹. And again : “A wise surgeon will get his instruments made of good iron and with sharp edges, by a blacksmith who is skilful and experienced in his craft.”² Vāgbhaṭa also gives the same directions.³

ORNAMENTATION.

In the absence of actual specimen, it is impossible to say whether there was any ornamentation on the surgical instruments of the Hindus. No ornamentation is described in the extant medical treatises. Only one instrument—Mucutī—is mentioned by Vāgbhaṭa II as being ornamented with a ring.⁴

EDGES OF SHARP INSTRUMENTS.

Suśruta says⁵ : “The edges of instruments, used in incising

¹ यदा सुनिश्चितं शस्त्रं रोमच्छेदि सुरंस्थितं ।

सुगटहीतं प्रभाणेन तदा कर्मसु योजयेत् ॥

Ibid, I. viii.

² See foot-note 2, P. 61.

³ षड्विंशतिः सुकर्मारैर्धटितानि यथाविधिः ।
शस्त्राणि रोमवाहीनि वाहुख्येनाङ्गुलानि षट् ॥
सुरूपाणि सुधाराणि सुयहाणि च कारवीत् ।
अकरालानि सुभातसुतौच्चावार्चतेऽयसि ॥
सुमाहितसुखायाणि नौलाभोजच्छवीनि च ।
नाभानुगतरूपाणि सदा सन्निहितानि च ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ सुचुटी सूक्ष्म दलर्जुमृले रुचकमूषणा ।

Ibid.

⁵ तवधारा भेदनानां मासूरी । लेखनानामईमासूरी ।

व्यधनानाँ विश्वावणानां वृ कैश्चिकौ । क्षेदनानामई कैश्चिकौति ॥

Suśruta Saṃhitā, I. viii,

(as of Vṛddhipatra, Nakhaśastra, &c.) should be of the fineness of a masūra (Ervum Lens); of those used in scarifying (as Māndalāgra &c.) of a half a masūra; of those used in puncturing (as Kuthārikā) and evacuating (as needles, kuśapatra, &c.) of a hair; and those used in dividing (as Vṛddhipatra), of half a hair". As to the Vaḍīsa or hook and the Dantaśāṅku or tooth-scalers, the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of barley."¹

THE TEMPERING OF SHARP INSTRUMENTS.

Suśruta remarks² that "the instruments are tempered in three ways;—by immersing the heated śastra in an alkaline solution, or water, or oil. Those tempered in an alkaline solution are used in dividing bones and in excising arrows and other foreign bodies. Those tempered in water are used in incising, dividing or clearing muscles; and those tempered in oil are used in puncturing veins and dividing nerves and tendons."

As the methods of tempering the śastras are the same as those recommended for the arms of war, we quote from Vṛddha Śāringadhara (the elder), two methods of tempering arrow-heads and swords. He says³: "I shall describe the ways of tempering arrow-heads, by smearing them with a paste of

¹ वडिशो दनशङ्कुशानताये तौक्षकरुकप्रथम यवपदवसुचे ।

Suśruta Saṁhitā, I. viii.

² तेषां पायना चिविधा चारीदकतैलेषु तत्र चारपायितं शरश्लग्रास्थिच्छेदनेषु ।
चदकपायितम् मांसच्छेदनभेदनपाटनेषु तैलपायितं सिरावधनखायुच्छेदनेषु ।

Ibid.

³ फलसर्ग पायनं वल्ये वनीषधिर्विलेपने: ।

यैन दुर्भेद्यवर्माणि भेदयीत् तरुपर्णवत् ॥

Vṛddhya Śāraṅgadhara,

vegetable drugs, which would thus acquire the power of piercing a coat-of-mail as easily as the leaf of a tree."

I.

"Make a paste of Pippalī (Piper Longum), rock-salt and Kuṣṭha (Saussurea Lappa) with cow's urine. These are to be well mixed until the paste becomes cold and yellow. The arrow-heads and other sharp cutting instruments are to be well smeared with that paste and then heated to redness. Then they are to be removed from the furnace and allowed to cool down to a state short of redness and dipped in oil. By this means, the iron acquires special power as a cutting instrument".

II.

"Make a paste of the five kinds of salts,² mustard and honey. Let the instrument-maker smear it on the śastras which are then to be heated in a furnace. When the colours resembling those of a peacock's feather are displayed on the śashtra, the burning is known to be adequate. The instrument is then dipped in water³".

¹ पिष्ठली सैखवं कुष्टं गोमूदैन तु पेषयेत् ।

अतिश्रीत मनाविञ्चं पीते नष्टं तथौषधम् ॥

अनेन लेपयेच्छस्व लिङ्मं चाग्नौ प्रतापयेत् ।

ततो निर्वापितं तैले लौहं तत्र विशिष्यते ॥

Vṛddhya Śāringadhara.

² सौखर्चलं सैखवच्च विड्मौङ्गिदमेव च ।

सामुद्रैन सहैतानि पञ्चसुर्लवणानि च ॥

Vaidyaka.

³ पञ्चभिर्क्षवणैः पिष्टं मधुसिक्तः ससर्षपैः ।

एभिः प्रलेपयेच्छस्व लिङ्मं चाग्नौ प्रतापयेत् ॥

शिखिश्चीबानुवर्णाभं तप्तपौतं तथौषधं ।

ततस्तु विमलं तीयं पाययेच्छस्वमुत्तमम् ॥

Vṛddhya Śāringadhara.

III.

The sage Uṣanās or Śukrācāryya thus describes¹ the tempering of swords in the Vṛhat Samhitā (Kern's trans. Ch. L.) :—

23. The fluid to imbrue a sword with, according to the precepts of Uṣanās, is: blood, if one wishes for a splendid fortune; ghee, if one is desirous to have a virtuous son; water, if one is longing for inexhaustible wealth.

24. An approved mixture to imbrue the sword with, in case of one desirous to attain his object by wicked means, is: milk from a mare, a camel and an elephant. A mixture of fish bile, deer-milk, horse-milk, and goat-milk, blended with toddy, will make the sword fit to cut an elephant's trunk.

25. A sword first rubbed with oil, and then imbrued with an unguent compounded of the milky juice of the Calotropis, goat's horn, ink, dung from doves and mice, and afterwards whetted, is fit for piercing stone.

¹ वड्बीश्चकरेणदुधपानं
यदिपानेन समीहतेऽर्थसिद्धिं ।
भषपिष्ठमृगाश्च वस्तुदुर्घैः
करिहस्तच्छिदये सतालगम्भैः ॥
आर्कं पथी हुङ् विषाणमसौसमेतं
पारवतास्तु शक्ता च युते प्रलिपेः ।
शस्त्रस्य तैलमधितस्य ततोऽस्य पानं
पश्चाच्छितस्य न शिलासु भवेद्विधातः ॥
चारि कदल्या मधितेन युक्तै
दिनीषिते पायितमायसं यत् ।
सम्यक् शितं धाश्मनि नैति भज्ञं
न चान्यलौहेष्वपि तस्य कौण्डलम् ॥

26. An instrument imbrued with a stale mixture of potash of plantains with butter milk, and properly whetted, will not get crooked on a stone, nor blunted on other iron instruments.

GOOD AND BAD QUALITIES OF SURGICAL INSTRUMENTS.

Suśruta says¹ : "The good points in an instrument are the following : it should have a well-made handle, affording a firm grasp ; it should be made of iron of good quality ; it should have a fine edge, a pleasant shape and a well-finished point ; and it should not be dentated (except the saw)." He gives preference to the Sastras which are of good make and with a fine edge—so fine as to divide the hairs on the skin and whose handles can easily be grasped by the surgeon's hand.

On the other hand, he points out eight defects² of sharp instruments : they must not be bent, or blunt, or broken, or jagged, or too thick, or too thin, or too long, or too short. Instruments free from these defects should be used. The Karapatra or saw is the only exception, for being used for sawing bones, it requires a jagged or dentated edge. Vāgbhaṭa also mentions these defects.³

¹ तानि सुयहाणि सुलीहाणि सुधारानि सुरूपाणि सुसमाहितमुखायण्करालानि चेति शस्त्रसम्पत् ।

Suśruta Samhitā, I. viii.

² तत्र वक्रं कुण्ठं खर्षं खरधारं मतिस्थूलमव्यल्पमतिदीर्घं मतिङ्गसमिल्पदौ शस्त्रदोषाः । अती विपरीतगुणमाददीतान्वय करपत्राचङ्गि खरधारमस्थिक्केदनार्थं ।

Ibid.

³ कुण्ठ-खर्ष-तनु-स्थूल-ङ्गस-दीर्घत्व-वक्रता: ।

शस्त्राणां खरधारलमष्टौ दोषाः प्रकौर्चिताः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

Suśruta enumerates twelve defects¹ of blunt instruments, viz., it may be too thick, or made of impure metal, or too long, or too short, or incapable of being grasped, or capable of being grasped (unevenly) partially, or bent, or made of too soft material, or of elevated ends, or it may have bent, loose, elevated, and weak pins, or be of weak ends, or of thin sides. These faults refer principally to the *Swastika yantras* or the cruciform instruments.

THE USES OF INSTRUMENTS.

Twenty four different kinds of operations² are said to be performed by the blunt instruments (Suśruta), viz.:—

- | | |
|-----------------|---|
| 1. Nirghātana | ... Extraction by moving to and fro. e. g. śalyanirghātāni. |
| 2. Pūraṇa ... | ... Filling the bladder or eyes with oil. |
| 3. Bandhana ... | ... Bandaging and binding by rope. |
| 4. Vyūhana ... | ... 1. Raising up and inoising a part for removing a thorn or 2. bringing together the lips of the wound. |
| 5. Vartana ... | ... Contracting or curling up. |

¹ तचातिख्यूलमसारमतिदीर्घमतिक्रस्तमग्राहिविषमग्राहि वक्त्रं शिथिलमत्युन्नतं मदुकीलं मदुमुखं मदुपाशमिति इदश्च यन्वदीषाः ।

Suśruta Samhitā, I. vii.

² यन्वकर्मानितु निर्धातनपूरणवस्त्रनव्यूहनवर्तनचालनविवर्तनविवर्णनविवरणमीडमार्गविशीधनविकर्षणाहरणात्मनीद्वयनविनमनभज्जनीच्छथनाचूषणैषणदारणर्जुकरणप्रचालनप्रधमनप्रमार्जनानि अतुर्क्षिंश्चतिः ।

6. Cālana ... 1. transferring, i.e., removing from one part to another; 2. moving a foreign body.
7. Vivartana ... Turning round.
8. Vavarana ... Exposing or opening out any part.
9. Piṭana ... Pressing as by finger to let out pus from an abcess.
10. Mārga Viśodhana ... Clearing the canals such as the urethra, rectum &c.
11. Vikarṣana ... 1. Extraction by pulling; or 2. loosening a foreign body fixed in muscles &c.
12. Āharana ... Pulling out.
13. Āñcana ... Pulling up.
14. Unnamana ... Elevating or setting upright as the depressed cranial bones or ears.
15. Vinamana ... Depression as of the elevated ends of the fractured bone.
16. Bhañjana ... 1. Rubbing the head, ears &c.; 2. contusing a part all round before it is surgically operated on.
17. Unmathana ... Probing or stirring the track formed by an impacted foreign body.
18. Ācuṣana ... Suction as of poisoned blood and milk by horns, or gourd, or mouth.

19. <i>Esāṇa</i> Exploring as by an earth-worm shaped probe, the direction of a sinus or the existence of a foreign body in the wound.
20. <i>Dāraṇa</i> Splitting or dividing as the head, ears &c.
21. <i>Rjukaraṇa</i>	... Straightening anything which is bent.
22. <i>Prakṣālana</i>	... Washing as a wound with water.
23. <i>Pradhamana</i>	... Blowing as powders into the nose through tubes.
24. <i>Pramārjana</i>	... Rubbing out as foreign bodies from the eyes &c.

Vāgbhāṭa recognises only fifteen different kinds¹ of operations performed by the blunt instruments: *Nirghātana* (moving to and fro), *Unmathana* (probing), *Pūraṇa* (filling up), *Mārga Śuddhi* (clearing passages), *Samvyūhana* (raising up and extracting a thorn by incision), *Āharana* (pulling out), *Bandhana* (bandaging), *Pīḍana* (pressing), *Ācūṣāṇa* (suction), *Unnamana* (elevation), *Nāmana* (depression), *Cāla* (movement), *Bhaṅga* (breaking), *Vyāvartana* (turning round); and *Rjukaraṇa* (straightening).

¹ निर्घातनोन्मथन पूरण मार्गशुद्धि
संव्युहनाहरण वस्त्रन पौडनानि ।
आचषणोद्भवन नामन चाल भङ्ग
व्यावर्तनजूकरणानि च यन्त्रकर्म ॥

The śastras or cutting instruments, on the other hand, are said to perform eight kinds of surgical operations (Suśruta).¹

- | | |
|----------------|---|
| 1. Chedana ... | Excision or removal of a part
of the body by operation as
of piles. |
|----------------|---|

Instruments :—Vṛddhipatra, nakhaśastra, mudrikā, utpalapatra, and arddhadhāra.

- | | |
|----------------|--|
| 2. Bhedana ... | ... Incision of a part, as of an
abscess. |
|----------------|--|

Instruments :—The same as above.

- | | |
|----------------|---|
| 3. Lekhana ... | ... Scarification or dissection of a
skin-flap; or scraping, as of
Rohini i.e., surgical diseases
of the throat. |
|----------------|---|

Instruments :—Mandalāgra and karapatra.

- | | |
|---------------------------|---|
| 4. Vedana or Vyādhana ... | Puncturing as of veins to bleed
patients by instruments
having fine points. |
|---------------------------|---|

Instruments :—Kuthārikā, vrīhimukha, ārā, vetaspatra,
and sūci.

- | | |
|--------------|---|
| 5. Eṣana ... | ... Probing, as of sinus and fistula
by a probe. |
|--------------|---|

Instruments :—Eṣanī.

- | | |
|----------------|--|
| 6. Āharana ... | ... Extraction, as of stone by the
spoon or hook. |
|----------------|--|

Instruments :—Vadiśa, and danta-śāṅku.

¹ तत्र शास्त्रकर्माण्डलविधं। तदथा। क्षेय' भेदं लिखं वैधमेष्वमाहार्थं विचाव्यं
सौव्यनिति।

7. Viśrāvana ... To let out pus as from a deep-seated abscess.

Instruments :—Sūcī, kuśapatra, ātimukha, śarārīmukha, antarmukha, trikurccaka, and eṣanī.

8. Sivana ... Stitching, as of the lips of a wound by needles.

Instruments :—The different kinds of sūcī or needles.

Caraka mentions, however, six kinds¹ of operations :—

1. Pātana ... Incision, as in operation for sinus, abscess, intestinal injury, and deeply impacted foreign bodies.
2. Vyādhana ... Tapping or piercing, as in operations for ascites, suppurating tumour, ovarian tumour, boils &c.

¹ पाठनं व्यधनञ्चैव छेदनं लिपनं तथा ।

प्रीच्छनं सौवनञ्चैव षड्विधं शस्त्रकर्म तत् ॥

नाडीत्रयाः पक्षशीघ्राक्षया चतगुदीदरम् ।

अन्तःशल्याश्च ये देशाः पाश्यात्ते तदिधाश्च ये ॥

दकोदराणि संपक्ता गुज्जाः ये ये च रक्तजाः ।

व्याधाः शीणितरीगाश वीसर्पेपिङ्गकादयः ॥

चद्वच्चान् खूलपर्थनागुत्सन्नान् कठिनान् ब्रह्मान् ।

अश्चःप्रभृत्यधीमांसं छेदनेनोपपादयेत् ॥

किलासानि सुकृष्टानि लिखेन्नेख्यानि बुद्धिमान् ॥

वातास्तुगृथ्यपिङ्गकाः सकीढा रक्तमण्डलाः ।

कृष्टान्यभिहितञ्चाङ्गं शीघ्रांश्च प्रच्छयेन्निषेक् ॥

सौब्यं कुकुरुदरायन् गन्धीरं यदिपाठितं ।

इति षड्विधमुहिष्टं शस्त्रकर्म मनौषिभिः ॥

3. Chedana Excision, as in the operation for tumours, raised and thickened *vraṇo* or corns, and piles.
4. Lekhana Scraping, as in operation for some varieties of skin diseases.
5. Pracchana Scarifying, as in the operations for glands, boils, leprous nodules, inflammatory swellings, &c.
6. Sibana Sewing, as in the operation of laparotomy for deep seated diseases in the abdomen.

Vāgbhaṭa describes thirteen kinds¹ of operations performed by the sharp instruments :—

1. Utpātana ... Raising up by incision, as by the Nakhaśastra.
2. Pātana ... Incision as by the Vṛddhipatra.
3. Sivana ... Stitching as by the Sūci.
4. Eṣaṇa ... Probing as by the Eṣanī.
5. Lekhana ... Scraping as by the Maṇḍalāgra.
6. Pracchana ... Scarification as by the Maṇḍalāgra.
7. Kuṭṭana ... Pricking as by the Sūci in tattooing.
8. Chedana ... Excision as by the Vṛddhipatra.

¹ उत्पात्य पात्य सौवैष-लिख-प्रच्छन्न कुट्टनम् ।

क्षेत्रं भेदं व्यधी मन्त्रो ग्रही दाहश तत्क्रियाः ॥

- | | |
|--------------|-------------------------------------|
| 9. Bhedana | ... Piercing as by the Sharp Eṣāṇī. |
| 10. Vyadhana | ... Tapping as by the Vetasapatra. |
| 11. Manthana | ... Churning as by the Khaja. |
| 12. Grahaṇa | ... Fixing as by the Sandamīśa. |
| 13. Dahana | ... Burning as by the rods. |

WHETSTONE.

In the R̄gveda we find the use of stones mentioned for whetting the edges of the arms of war.¹ The Hindu surgeons used a stone slab for sharpening the sastras or edged instruments.² It was of the colour of māṣa (Phaseolus Roxb.). The whetstones used by the Greeks and Romans were either the marble ointment slabs, or made of clay slate or sandy schistaceous shale.

INSTRUMENT CASES.

To preserve the edges of the cutting instruments, a case made of the wood of salmālī (Bombax Malabaricum) was used (Suśruta).³ Such cases were also manufactured of canvas, or wool, or silk, or leather. These cases—twelve *anguli* (*i.e.*, fingers' breadth) long and nine *anguli* broad—were well sewn and

¹ See R̄gveda, Mandala. 2 Sūkta. 39 Verse 7.

„	9	„	90	„	1.
„	9	„	112	„	2.
„	10	„	53	„	9.
„	19	„	101	„	2.

² तेषां निश्चानार्थं श्वस्याप्तिः माघवर्णः।

Suśruta Saṁhitā, I. viii.

³ धारसंस्थापनार्थं श्वस्याप्ती फलकमिति।

consisted of compartments, lined with wool and separated by partitions for each instrument. They could be folded; closed with a rod and firmly tied by a knot.¹ The barbers of India still use similar cases for their instruments.

That the razor used to be kept in a case, we know from a passage in the Vṛhadāranyaka (800 to 500 B. C.) where the author says "It (the Atman) is here all-pervading down to the tips of the nail. One does not see it any more than a razor hidden in its case or fire in its receptacle".²

¹ स्याद्रवाङ्गुलि विस्तारः सुधनी वादशाङ्गुलः ।
कौम पट्टीर्ण कौषिय दुकूल चृदु चर्मजः ॥
विन्यस्त पाशः सुस्थूतः सान् रीर्णास्य शस्त्रकः ।
शलाका पिहितास्य श शस्त्रकीषः सुसच्चयः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

अथ शस्त्राणां सुरचनार्थं शस्त्रकीष माह स्यादित्यादि । नवाङ्गुलिविस्तारः नवाङ्गुल परिमानविस्तारविशिष्टः शस्त्रकीषः स्यात् । शस्त्रस्य कीषः शस्त्रकीषः । कीष चाप् इति खीके । यथा असिकीष इत्यादि । तथा सुषु, घनी, निविडः सुधनः तथा वादशाङ्गुलः दैर्घ्येण वादशाङ्गुल परिमानः, तथा चौमादिजः । तथा विन्यस्तः यथा क्रमेण क्रतः पाशी थस्य स विन्यस्तपाशः । तथा सुषु, खूतः क्रत सेवनः, सुस्थूतः तथा सान्तराणि सव्यवधानानि, जर्णास्थानि भेषादिलोभमर्थेस्थितानि, शस्त्रानि यस्मिन् स सान्तरीर्णास्यशस्त्रकः । तथा शलाकया: पिहितं स्थागितं आस्यं सुखं थस्य स शलाकापिहितास्य तथा सुषु सञ्चयी, नापित भाष्मिकवद्राशीकरणं थस्य स सुसच्चयः । चौमं अतसीसुवभववस्तु कीन्विस् ख्यातः । दुकूलशब्दः पट्टादिभिः स्त्रिभिः सञ्चयते । तेन पट्टदुकूलं पाट् इति ख्यातेन सूत्रेन निर्मितं वस्त्रं ऊर्णी, सेषादिलोम तङ्कवं वस्त्रं और्ण दुकूलवनात् इत्याख्य वस्त्रादि । कौषियदुकूलं कौषिकार-कौठभव सूत्रेण रेशम् इति ख्यातेन निर्मितं वस्त्रं ।

Vāgbhaṭārtha Kaumudi.

² Vṛhadāranyaka, I. iv.

Macdonell's Sanskrit Literature, p. 22.

To prove that portable cases for medicaments and instruments were in use in ancient India, we quote *in toto* from the *Mohāvāgga* some references to them.¹

BOXES FOR OINTMENTS, OINTMENT POTS, AND PORTABLE CASES.

Now at that time, the Bhikkhus used to put pulverised ointments into pots and saucers. They became sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a box for ointment".

Now at that time the *Khabbaggiya* Bhikkhus used to carry about various kinds of boxes for ointments—gold ones and silver ones. People were annoyed, murmured and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of boxes for ointments, gold ones, and silver ones, are not, O Bhikkhus, to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of such boxes made of bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of bronze, or of the centre of the chank-shell (*Sankhu-navi*)."

2. Now at that time the boxes of ointment had no lid. (The ointment) was sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

¹ *Mohāvāgga* vi. 12. (Sacred Books of the East).

"I allow you, O Bhikkhus, the use of a lid."

The lid used to fall off.

"I allow, O Bhikkhus, to fasten the lid with thread and tie it on to the box."

The boxes used to fall.

"I allow you, O Bhikkhus, to sew the boxes on with thread".

3. Now at that time the Bhikkhus used to rub ointment on with their fingers, and the eyes were hurt.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a stick or holder to put the ointment on with".

Now at that time the *Khabbaggiya* Bhikkhus used to keep various kinds of ointment-sticks—gold ones, and silver ones. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world".

They told this thing to the Blessed One.

"Various kinds of ointment-holders, O Bhikkhus, are not to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of ointment-holders of bone, or of ivory, or of horn, or of the nala reed, or of bambu, or of wood, or of lac, or of fruit, or of bronze, or of the chank-shell."

4. Now at that time the ointment-sticks used to fall on the ground and become rough.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a case for the ointment-sticks".

Now at that time the Bhikkhus used to carry the ointment-boxes and ointment-sticks about in their hands.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a bag to put the ointment-box in."

They had no shoulder strap.

"I allow you, O Bhikkhus, the use of a shoulder strap (by which to carry the ointment-box), or of a thread (by which to sew or tie it on)."

13.

1. Now at that time the venerable Pilindavakkha had head-ache.

"I allow, O Bhikkhus, the use of a little oil on the head".

(The disease) became no better.

"I allow, O Bhikkhus, the practice of taking up (medicine) through the nose". (See commentary on the Dhammapada, pp. 83.)

The nose ran.

"I allow, O Bhikkhus, the use of a nose-spoon" (Natthukarani).

Now at that time the Khabbaggiya Bhikkhus had various kinds of nose-spoons—made of gold, and of silver. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One,

"Various kinds of nose-spoons, O Bhikkhus, are not to be used. Whosoever does so, is guilty of dukkata offence. I allow, O Bhikkhus, the use of such nose-spoons made of bone, (&c., as in chap. 12, 1, down to :) the chank-shell."

2. The nose took up the medicament in unequal proportions.

"I allow, O Bhikkhus, the use of a double nose-spoon (yamaka-natthu-karani)."

They used to spread the drugs on a wick before they sniffed up the aroma: and their throats got burnt.

"I allow, O Bhikkhus, the use of a pipe to conduct the aroma."

Now at that time the Khabbaggiya Bhikkhus had various kinds of pipes (&c., as in the last clauses of § 1, down to the end).

Now at that time the aroma-pipes came open: and worms got in.

"I allow, O Bhikkhus, the use of a lid to the pipes."

Now at that time the Bhikkhus carried the pipes about in their hands.

"I allow, O Bhikkhus, the use of a bag to carry the aroma-pipes in."

The aroma-pipes rubbed against one another.

"I allow, O Bhikkhus, the use of a double bag."

They had no shoulder strap.

"I allow, O Bhikkhus, the use of a shoulder strap (by which to carry the double bag), or of a thread (by which to sew it on).

OPERATION TABLE.

In the examination for piles, Suśruta directs the patient to lie down on his bed or on a board¹; and in describing the operation, Vāgbhaṭa II mentions a board to be used as an operation table.² A similar bed, as long as the distance from the top of the head to the knees of the patient, is also mentioned in the description of the lithotomy operation.³ The use of a board as a fracture bed is also advised.

For passing the tubes of the *vasti-yantra* or clysters into the urethra in the male, the patient is recommended to sit on a stool as high as his knees (*jānumātrāsana*).⁴

In phlebotomy, the patient is advised to sit on a stool, an aratni high⁵ (i.e. the distance between the tip of the olecranon process of the ulna to the tip of the little finger).

¹ भृक्तवन्तमुपवेश्य सम्भूते शुचौ देशे साधारणे व्यभे काले समे फलके श्वायायां वा प्रत्यादित्य-
युद्धमन्त्योत्सङ्गे निषष्ठपूर्वकायसुन्तानं * * * *

Suśruta Saṁhitā, IV. vi.

² शुचिं कृतस्त्वयन् भृक्तविष्णुवमन्त्यथम् ।

श्वायने फलके वान्यनरोत्सङ्गे व्यापश्चितम् ॥

Aṣṭāṅga Hṛdaya, VI. viii.

³ ततो वलवन्तमविक्लवमाजानुसमे फलके प्रागुपवेश्य पुरषज्ञ तस्मैत्सङ्गे निषष्ठपूर्वकाय-
सुन्तानमुद्रतकटीकं ।

Suśruta Saṁhitā, IV. vii.

⁴ खातसर भृक्तभृत्तसर रसेन पथसापि वा ।

चृष्टविष्णुत्ववेगस्य पौढे जानुसमे सदौ ॥

Caraka Saṁhitā, VIII. ix.

⁵ तत्र व्यधसिरं पुरुषं प्रत्यादित्यमुखमरविमानोच्छिते उपवेश्यासने ।

Suśruta Saṁhitā, III. viii.

अप्रितापातपखिन्नो जानूञ्जासनसंस्थितः ।

वृद्धपदात्तकेशान्तो जानूञ्जापितकर्प्परः ॥

Aṣṭāṅga Hṛdaya, I. xxvii.

KAPĀTA-ŚAYANA OR FRACTURE-BED.

In the treatment of fractures of the lower extremities, mention is made of the *kapāta-śayana* (*lit. door-bed*) or fracture-bed, consisting of a plank of wood resembling the panel of a door.¹ The patient is to lie down on it. The board has five rods fixed to it, to which the fractured limb is tied to prevent any movement: two on each side of the joint and one on the plantar surface of the foot. Dallāṇa explains it thus²: In fractures of the bones of the leg, two rods are fixed on each side of the ankle and one supports the foot; in fracture of the thigh bone, two rods are fixed on each side of the knee or hip, and one under the foot. In a double fracture of the thigh bone and bones of the

¹ अथ जङ्गोरभग्रानां कपाटशयनं हितं ।
कीलका वस्त्रनार्थञ्च पञ्च कार्या विजनता ।
यथा न चलनं तस्य भग्रस्य क्रियते तथा ।
सम्बेदयतौ द्वौ ही तले चैकश्च कीलकः ।
श्रीशां वा पुष्टवंशे वा वस्त्रस्त्रकयोस्थाप ।
भग्रसम्बिविमोक्षेषु विधिमिन् समाचरेत् ॥

Suśruta Samhitā, IV. iii.

² जङ्गोरभग्रेषु पञ्चात् कर्मविशेषं निर्दिशनाह । अथ जङ्गोर्त्यादि । जङ्गोरभग्र-चिकित्सितमाह । भग्रानाम् काण्डभग्रानाम् । द्विविधानामपीत्यपरे । कपाटशयनमवश्यं कार्यम् । चलनम् कपाट शयनेनैव सह देशनरनयनार्थम् । आधारभूतशयनचालनार्थ-मित्यन्ये । आधेयभूतशरीरावयवचलन परिहारार्थं कीलाः । कीलानां पञ्चसत्त्वात्म । जङ्गोर्वैर्द्योरेकतरस्य भग्रमवेत्य तत्र जङ्गाभग्रे तु शुल्फसम्बेदयतौ द्वौ एकश्च तले एवं पञ्च । जङ्गभग्रे जानुसम्बेदयतौ द्वौ ही । वङ्गासम्बेदयतस्ले चैक इत्यतापि पञ्च । उभयभङ्गा-पैचया तु समभिरेव कीलैर्यन्तरणम् । तथाह उभयतौ वह्निद्वौ शुल्फयोद्वौ च जानुनोः द्वौ च वङ्गाखयोः तले चैक एवं सप्त । अत जङ्गोर्वैः पार्श्वयोर्वौ द्वौ तले चैकश्च कीलक इति केचित् पठन्ति । तत्रिवस्त्रकारैर्न पठितम् । तस्मान्न पठनीयम् । गयदासशाव पाठान्तरं किमपि पठति । तस्माभावान्न लिखितम् ।

Dallāṇa's Commentary, IV. iii.

leg, seven rods are required,—two on the outer side of the ankle, knee, and groin, respectively, and one under the foot. The fracture-bed is recommended to be similarly availed of in fractures and dislocations of the loin, the spinal column, the chest, and the clavicle. And this mode of treatment, he adds, may advantageously be used for the other kinds of fractures and dislocations. Vāgbhaṭa II also mentions it in the treatment of fractures¹.

Hippocrates used a similar fracture-bed for the proper treatment of fractures and dislocations. It was called Scammum Hippocratic or bench of Hippocrates. As the figures of this bench would elucidate the structure of the *kapāta-sayana*, we reproduce here three plates with their explanations given at the end of Vol. II, Genuine Works of Hippocrates (Syed. Soc.Ed.), and two plates—Scammum Hippocratis and Plinthium Nilcii from the Collection De chirurgiens Grecs.

Fig. 1. The Scammum Hippocratis or Bench of Hippocrates, as represented by Andreas a Cruce (*Officina chirrugica venetiis*, 1596).

Fig. 2. The same as represented by M. Littré.

A. A board; 6 cubits long, 2 broad and 12 inches thick ; not 18 as incorrectly stated by M. Littré.

B. The feet of the Axles, which are short.

कटी जहोऽमग्नानि कपाटशयनं हितम् ।

यन्वणार्थं तथा कौलाः पच्च कार्या विवन्धनाः ॥

जहोर्वेः पार्श्वयोर्ज्ञैँ ही तल एकेश कौलकः ।

श्रीणां वा पृष्ठवंशे वा वक्रस्ताचकयोक्त्वा ॥

CC. Axe-trees.

DD. Grooves 3 inches deep, 3 broad, separated from one another by 4 inches.

E. A small post or pillar, fastened in the middle of the machine in a quadrangular hole.

F. Pillars a foot long.

G. A cross-beam laid on the pillars FF, which can be placed at different heights by means of holes in the pillars.

Fig. 3. Representation of the mode of reducing dislocation of the thigh outwards, as given by M. Littré (*Euv. d'Hipp.*, tom. iv, p. 305).

A mistake in the figure given by M. Littré is here corrected.

A. A lever applied to the nates of the luxated side, and acting from without inwards, in order to bring the head of the bone into its cavity.

B. Another lever, held by an assistant, put into one of the grooves of the machine, and intended to act against lever A.

C. Grove in which the end of the lever A takes its point of support.

D. The luxated member.

EE. Extension and counter-extension.

Fig. 4. Banc d'Hippocrate, d'après Rufus, servant à réduire différentes luxations. (*Collection De Chirurgiens Grecs, Bibliothèque Nationale*).

Fig. 5. Plinthium, ou cadre de Nileus, d'après Héliodore. (*Ibid*).

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS.

The armamentarium of the Hindu surgeons consisted of a good number of surgical instruments. They are described to be of two kinds, the *yantras* and the *śastras*, i.e., the blunt and the sharp instruments. Suśruta enumerates no less than one hundred and one varieties of the blunt instruments, and twenty different kinds of sharp instruments. Hārīta, on the other hand, enumerates twelve blunt instruments, twelve sharp instruments, and four prabandhas, as necessary for the operation of extraction of arrows and other foreign bodies.¹ Vāgbhaṭa II mentions one hundred and fifteen kinds of blunt and twenty-six kinds of sharp instruments. Pālakapya (Treatment of Elephants) mentions ten kinds of *śastras* or sharp instruments though he describes the uses of other instruments required for the surgical treatment of diseases.

INSTRUMENTS AND THEIR CLASSIFICATION (SUŚRUTA.)

Of the one hundred and one varieties of the blunt instruments, the surgeon's hand is rightly considered as the principal instrument, for without its help, no instrument can properly be used, and every surgical operation is under its control.² They are recommended to be used for the extraction

¹ दादशेव तु यन्त्राणि शस्त्राणि दादशेव तु ।

चलारि च प्रवन्धानां श्ल्योज्ञारे विनिर्दिशेत् ॥

² यन्त्रशतमेकोचरमव हस्तमेव प्रधानतमं यन्त्राणामवगच्छ । किं कारणं । यन्त्राहस्ताद्वै यन्त्राणामप्रभृतिरेव तदधीनलाद्यन्तकर्मणां ।

तत्र मनःशरीरावाधकराणि श्ल्यानि तेषामाहरणीपायी यन्त्राणि ।

of *śalya* or foreign bodies, e.g., a dart, an arrow, a javelin, a spear, a peg, a pin, a bamboo rod, a stake &c. which cause pain to the body and mind.

A. Suśruta subdivides the blunt instruments into six classes,¹ viz.:

I.	Svastika or cruciform instruments	... 24 kinds.
II.	Sandaṁśa or pincher-like	... 2 "
III.	Tāla or picklock-like	... 2 "
IV.	Nāḍī or tubular or hollow	... 20 "
V.	Śalākā or rod or pricker-like	... 28 "
VI.	Upayantra or accessory	... 25 "
		—
		101

These instruments are advised to be made generally of iron, or of other suitable materials, when iron is not available. Their ends often resemble the faces of some ferocious beasts, or of deers, or birds. Hence the instruments should be so constructed as to have the likeness of their faces, following at the same time the directions of scientific treatises, or the instructions of teachers, or in imitation of other instruments, or in adaptation to the exigencies of the time. They should be of reasonable

¹ तानि षट्प्रकाराणि । तदथा । खस्तिकयन्ताणि । सन्दश्यन्ताणि । तालयन्ताणि । नाडीयन्ताणि । श्लाकायन्ताणि । उपयन्ताणिचेति । तत्र चतुर्विंशति खस्तिकयन्ताणि । चै सन्दश्यन्ते । चै एव तालयन्ते । दिश्तिर्नायः । अष्टविंशतिः श्लाकाः । पञ्चविंशतिः उपयन्ताणि ।

Suśruta Saṁhitā, I. vii.

Hessler translates the terms as follows : *Uncinata instrumenta, forcipum instrumenta, palmiformia instrumenta, hamata instrumenta, secundaria instrumenta,*

Hessler's Suśruta, I. vii,

size, with their ends rough or smooth as required. They should be of strong make, good shape and capable of a firm grasp.¹

I. The Svastika or Cruciform instruments are—

1. Simhamukha. 2. Vyāghramukha. 3. Vṛkamukha.
4. Tarakṣumukha. 5. Rkṣamukha. 6. Dvīpimukha.
7. Mārjāramukha. 8. Śrgālamukha. 9. Airvvārukamukha
10. Kākamukha. 11. Kaṇikamukha. 12. Kuraramukha.
13. Cāsamukha. 14. Bhāsamukha. 15. Śaśaghātīmukha.
16. Ulūkamukha. 17. Cillimukha. 18. Gr̥dhamukha.
19. Śyenamukha. 20. Krauñcamukha. 21. Bhṛngarājamukha.
22. Añjalikarṇamukha. 23. Avabhañjanamukha, and
24. Nandimukhamukha.

II. The Sandamīsa or pincher-like instruments are—

1. Forceps with arms.
2. Forceps without arms.

¹ तानि प्रायश्ची लौहानि भवन्ति तत्प्रतिरूपकाणि वा तदलाभे । तच नानाप्रकाराणां व्यालानां सुगपचिणां मुखेमुखानि यन्नाणां प्रायशः सुट्टानि तस्मात्तसाक्षादगमादुपदेशादन्यथन्तदर्शनादुक्तितश कारयेत् ।

समाहितानि यन्नाणि खरञ्च्छामुखानि च ।

सुट्टानि सुरूपाणि सुयहाणि च कारयेत् ॥

Suśruta Samhitā, I. vii.

अनेकरूपकार्याणि यन्नाणि विविधान्यतः ।

विकल्पं कल्पयेद् तु ज्ञाय यथासूलन् वक्ष्यते ॥

* * * * *

अलौहानुशस्त्राणि तान्येवच्च विकल्पयेत् ।

अपराण्यापि यन्नादैन्यपयोगज्ञ यौगिकम् ॥

Aṣṭāṅga Hṛdaya, I. xxv.

III. The Tāla or picklock-like instruments are—

1. Ekatāla.
2. Dwitāla.

IV. The Nādī or tubular instruments are—

For fistula-in-ano ... (1) with one slit ; (2) with 2 slits ...	2
For piles ... (1) with one slit ; (2) with 2 slits ...	2
For wounds	1
For clysters (Rectal) ... (Some authors describe 3 only) ...	4
For clysters (vaginal and urethral)... (male and female) ...	3
For Hydrocele	1
For Ascites	1
For fumigation and inhalation	3
For Urethral Stricture	1
For Rectal , ,	1
For Cupping—gourd	1
	—
	20

V. The Salākā or rod-shaped instruments are—

Gandūpadamukha or earth-worm like ...	2
Śarapunkhamukha or arrow-stem like ...	2
Sarpañamukha or snake's hood like ...	2
Vadiśamukha or fish-hook like ...	2
Masūradalamukha or masūra pulse like ...	2
Promārjana or swabs ...	6
Khallamukha or spoons ...	3
Jāmvavavadana or jambul seed like ...	3
Añkuśavadana or goad like ...	3
Kolāsthidalamukha or plum seed like ...	1
Mukulāgra or bud shaped ...	1
Mālatipuspavṛntāgra or like the stem of mālatī flower .	1
	—
	28

VI. The Upayantra or accessory instruments are—

1. Rajju—thread. 2. Venikā—twine. 3. Patta—bandages.
4. Carma—leather. 5. Valkala—bark of trees. 6. Latā—creepers. 7. Vastra—cloth. 8. Aṣṭhilāśma—stone or pebble.
9. Mudgara—hammer. 10. Pānipādatala—palm of the hand and sole of the foot. 11. Āṅguli—finger. 12. Jihvā—tongue. 13. Danta—tooth. 14. Nakha—nail. 15. Mukha—mouth. 16. Vāla—hair. 17. Aśvakaṭaka—the ring of a horse's bridle. 18. Śākhā—branch of a tree. 19. Sthīvana—spittle. 20. Pravāhaṇa—fluxing the patient. 21. Harṣa—objects exciting happiness. 22. Ayaśkānta—a loadstone. 23. Kṣāra—caustic. 24. Agni—fire. 25. Bheṣaja—medicines.

B. The sharp instruments or śastras are—

1. Mandalāgra or round headed knife.
2. Karapatra or saw (*lit.* like the human hand).
3. Vṛddhipatra (*lit.* like the leaf of vṛddhi—an unknown medicinal plant)—a razor.
4. Nakha-śastra or nail-parer.
5. Mudrikā or finger-knife (like the last phalanx of the index finger).
6. Utpalapatra, a knife, *i.e.*, resembling the petal of a blue lotus, (*Nymphaea stellata.*, Willd.).
7. Arddhadhāra or a single-edged knife.
8. Sūci—needles.
9. Kuśapatra—a knife shaped like the kuśa grass (*Eragrostis Cynosuroides*).

10. Ātimukha—a knife shaped like the beak of the Ātī bird (*Turdus Ginginianus*).
11. Śararī-mukha—a pair of scissors like the beaks of Śararī bird.
12. Antarmukha (*lit.* having internal sharp edge)—a kind of scissors.
13. Trikurccaka—an instrument consisting of three needles.
14. Kūthārikā—a small axe shaped instrument.
15. Vṛihimukha—a trocar shaped like a grain of rice.
16. Arā or awl.
17. Vetasa-patraka—an instrument shaped like the leaf of a rattan (*Calamus Rotang*).
18. Vadīśa—an instrument shaped like the fish-hook.
19. Dantaśaṅku or tooth-pick.
20. Eṣani or sharp probe-like instrument.

According to Hārīta¹ the twelve blunt instruments are—

1. Godhāmukha or iguana-faced. 2. Vajramukha—grdhra-mukha ? 3. Tribakra or three faced. 4. Sandamśa or pincher.

¹ गीधामुखं बज्रमुखं चिवकृं नाम सन्दंशचक्राक्षतिकङ्घपादम् ।
अथानकं शङ्खकुरुखलच्च श्रीवत्ससौवत्सिकं पञ्चवक्रं ।
इदंशेतानि यत्नाणि कथितानि भिषग्वरैः ।
अथ शस्त्राणि प्रीक्तानि नामानि च पृथक् पृथक् ।
अहंचन्द्रं श्रीहिमुखम् कङ्घपत्रं कुठारिका ।
करवीरकपत्रच्च शलाककरपत्रकम् ।
वडिशं गटप्रपादच्च श्ली च सूचिमुङ्गरम् ।
शस्त्राणेतानि प्रीक्तानि श्ल्योद्धारे पृथक् पृथक् ॥

5. Cakrākṛti or circular shaped. 6. Anaka ? 7. Kaṅkapāda ?
 8. Śringa or horn. 9. Kundala ? 10. Śribatsa ? 11. Saubatsika ?
 12. Pañcabaktram, *i.e.*, five faced—śiṁhamukham ?

The twelve sharp instruments of Hārita are—

1. Arddhacandra or half-moon shaped. 2. Vṛihimukha.
 3. Kaṅkapatra. 4. Kuṭhārikā. 5. Karavīrakapatraka. 6. Śalākā or sharp probe. 7. Karapatraka or saw. 8. Vadīṣa or sharp hook. 9. Grdhrapāda ? 10. Śūlī 11. Sūcī or needle. 12. Mudgara or hammer ?

Vāgbhaṭa II classifies the instruments in the following way :-

A. Blunt instruments—

I. Svastika, as heron, lion, bear, crow, deer

forceps &c.	24
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II. Sandamīsa: It consists of two iron blades soldered at one end, the other

ends being free	2
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(a) for extraction of eyelashes &c.	...	1
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(b) mucuṭī	...	1
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III. Tāla

...	2
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(a) Ekatāla	1
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(b) Dwitāla	1
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IV. Nāḍī or tubular:

...	23
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(a) Kanṭhaśalyāvalokinī or throat speculum having three and five holes	...	2
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(b) Śalyanirghātanī	...	1
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(c) For piles, different sizes for male and female	6
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For inspection : 2 holes—rectal speculum	2
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For medication : 1 hole	...	2
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For applying pressure : entire—śāmi	...	2
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(d) For fistula-in-ano: with one and two holes		2
(e) For nasal polypus &c.	1
(f) Ānguli-trāṇaka or finger-guard	1
(g) Joni-vraṇekṣāna or vaginal speculum	1
(h) Vrāṇo vasti or wound syringe	1
(i) For dakodara or Paracentesis abdominis		1
(j) Vastiyantra or clysters: rectal, vaginal and urethral	3
(k) For fumigation...	...	1
(l).Cupping instruments: Alābu, Ghaṭīyantra and Horns	3
		—
		23
V. Śalākā or rod-like instruments	...	34
(a) Gaṇḍūpadamukha or earth-worm shaped		2
(b) Maśūradalabaktra	2
(c) Śaṅku	9
Fanibaktra or snake's hood	...	2
Śarapuṇkamukha	...	2
Vadiśa or blunt hook	...	2
Garvaśaṅku or delivery hook	...	1
Āśmarī or lithotomy hook	...	1
Śarapuṇkamukha or tooth extractor	...	1
(d) For wiping out discharges	...	6
For rectum	2
For nose	2
For ears (karnaśodhana)	2
(e) For application of actual and potential cauteries	11
Jāmvobouṣṭha, three for each	...	6

Arddhendu or half-moon shaped, for hernia	1
Kolāsthidala for nasal polypus	... 1
Nail-shaped	... 3
(f) For cleansing	... 3
Rectum	... 1
Vagina	... 1
Urethra	... 1
(g) Collyrium probe	... 1
	<hr/>
	34

VI. Anuyantra or accessory instruments are nineteen in number. To the list of Suśruta he adds the following¹ :—

Goat's gut, silk, time, suppuration, and fear.

B. The sharp instruments of Vāgbhaṭa are twenty-six in number.²

1. Mandalāgra. 2. Vṛddhipatra. 3. Utpalapatra. 4. Adhyaruddhadhāra. 5. Sarpāsyā. 6. Eṣanī:—Gandūpadamukhā and Sūci-mukhā. 7. Vetasa. 8. Śarāri. 9. Trikureccaka. 10. Kuśapatra 11. Ātivadana. 12. Antarmukha and Arddhacandrānan. 13. Vrīhibaktra. 14. Kuṭhāri. 15. Kuravakasalā. 16. Aṅguliśastra. 17. Vadiśa. 18. Karapatra. 19. Kartari. 20. Nakhaśastra 21. Dantalekhana. 22. Sūci. 23. Kurcca. 24. Khaja. 25. Ārā. 26. Karṇavedhanī.

¹ अनुयन्त्राण्यथस्तान्तं रञ्जु वस्त्राऽप्स्म मुद्धराः ।

पट्टान्तं जिह्वा वालाश्च शाखा नखं सुखं द्विजाः ॥

काखः पाकः करः पादोभयं हृषेष्व तत् क्रियाः ।

चपायविंश्टं प्रविभजेदलोच्च निपुणं धिया ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² षड्विंशतिः सुकर्मार्दीष्टितानि यथाविधि ।

शस्त्राणि रोमवाहीनि वाहुल्येनाङ्गुलानि षट् ॥

सुरूपाणि सुधाराणि सुग्रहाणि च कारयेत् ।

अकेरलानि सुधात् सुतीच्छावार्त्तेऽयसि ॥

Ibid. I. xxvi.

Bhāvamīśra mentions the following blunt and sharp instruments: Eṣanī, Jāmvouṣṭha Śalā,¹ Sūci² and knives generally in making incisions which should be shaped like Kharjjūrapatrika, (like the leaf of Kharjjūra tree, Phœnix Sylvesteris, Roxb.) Arddhacandra, Candravarga, Sūcimukha and Abāñmukha.³

Pālakapya⁴ mentions ten kinds of śastras :—1. Vṛddhipatra. 2. Kuśapatra. 3. Mandalāgra. 4. Vṛihimukha. 5. Kuṭhārī. 6. Vatsadanta. 7. Utpalapatra. 8. Śalākā. 9. Sūci or needles. 10. Rampaka. Besides these he refers to Vadīśa.

Of the blunt instruments he mentions:—Jāmvobouṣṭha—(four in number, for application of actual cauteries), Simhadamṣṭrā, Godhāmukha, Kañkamukha, Kuliśamukha—(for extraction of foreign bodies), Eṣanī or probes (three), wound syringe, Vastiyantra, Śalākā or rods, yaṣṭhiyantra, Karkataka, Dyātūha, Makaraka (crocodile), Śārdḍūlamuṣṭhika (tiger's claws), Nandimukha (Turdus Ginginianus).

¹ एषखा गतिमन्त्रिष्य चारस्वानुसारिनीम् ।

सूचौ निदधादव्यने प्रोद्धाम्याशु विनिहरेत् ॥

Bhāva Prakāśa. II. iv., Nādi Vraṇādhikāra.

² आगनुजे भिषग्नाडौं शस्त्रेणीत् क्रत्य यन्तः ।

जान्बोष्टीनाग्निवर्णेन तप्तया वा शलाकया ॥

Ibid. Bhagandarādhikāra.

³ गतिमन्त्रिष्य शस्त्रेण हिन्दात् खर्जूरपविकम् ।

चन्द्राईं चन्द्रवर्गच्च सूचौ मुखमवाङ्मुखम् ॥

Ibid.

⁴ तत्र शस्त्राणि दशनामसंख्यानानि भवन्ति । तद्यथा हङ्गिपवम्, कुशपत्रम्, मण्डलायम्, ब्रौहिमुखम्, कुठाराक्षति, वत्सदन्तम्, उत्पलपत्रम्, शलाका, सूचौ, रम्पकश्चेति । फालजाम्बवतापिकादर्थाक्षतयश्चेति । एतान्याग्निकर्त्तविधाने चत्वारि चान्यानि श्ल्यञ्ज्ञरणानि यथायोगं सिंहद्रंड़ं गोधामुखं कङ्गमुखं कुलिशमुखं चेति । तित्र एषिण्यः ।

CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS.

Now we shall describe the instruments in detail. The Yantras or the blunt instruments will be considered first, and next the Sastras or the sharp instruments.

I. The Svastika yantra or Cruciform Instruments.

The word svastika is a technical term signifying one of the twenty-four signs of the Jinas; and it can be represented by two lines crossing each other, the arms of the cross being bent at their extremities towards the same direction. So these instruments may be described as cruciform. They have, as a rule, a length of eighteen anguli. Their ends should be shaped like the faces of the following ferocious beasts (1 to 8), deer (9), and birds (10 to 24), and the instruments are to be called after their names.¹ They are divided into two classes; the instruments of class I resemble the mouths of lion (simha) and tiger (vyāgra), while class II comprises the instruments which have the likeness of the faces of birds of prey. The fulcrums of these instruments which are at the middle, are of the size of a masūra (Ervum lens). The handles are either rounded off, or bent at an angle at their ends, like an elephant driver's goad—the object being to afford a good grasp of the instrument by the surgeon's hands. The svastika instruments are used for the extraction of

¹ तत्र स्तिक्यन्वाण्याददशाङुलप्रमाणानि सिंहव्याप्रब्लकतरहुक्तचवौपिमार्जीरश्गालमृगै
र्बाहककाककङ्कुररचासभासशशधात्यलूकचिङ्गिश्येनश्प्रक्षोच्चभङ्गराजाञ्जलिकर्णवभङ्गनन्दि-
मुखमुखानि मसूराक्तिभिः कौलैरववद्वानि मूलेऽङ्गशवदावच्चवारङ्गाण्याख्यिनश्चत्वोऽप्त्वा-
णार्थमुपदिश्यन्ते ।

foreign bodies impacted in the bones.¹ If the foreign body is visible, extract it by the lion forceps or similar forceps of class I. If it is invisible, it should be extracted by the Heron forceps or similar forceps of class II. Of all the varieties of svastika instruments, the Heron forceps (*kaṅkamukha*) is the best, for it can be easily introduced and turned in all directions, and also it grasps firmly and extracts a foreign body with ease and can be applied without any harm to all parts of the body.²

Class I :—

1. *Simhamukha svastika* or Lion-faced forceps :—this instrument is said to have its mouth shaped like that of a lion (*Felis leo*). It is the principle instrument of the class I. It is

¹ तुल्यानि कङ्गसिंहर्चकाकादिस्तगपचिणां ।
मुखैर्मुखानि यन्नाणां कुर्याच्चत् संज्ञकानि च ॥
अष्टादशाङ्गुलयामान्यायसानि च भूरिशः ।
मस्राकारपर्थनेः कण्ठेवज्जानि कीलकैः ॥
विद्यात् खस्तिक यन्नाणि मूलिङ्गुश्नतानि च ।
ते हृदैरस्तिसंलग्न श्ल्याहरणमिष्यते ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² दृश्यं सिंहमुखादैरु गृदः कङ्गमुखादिभिः ।
निर्वरेतु श्लैः श्लैः शास्त्रयुक्तियपेच्या ॥
विवर्तते साध्ववगाहते च श्लैः निरक्षीज्जरते च यथात् ।
यन्त्रेष्वतः कङ्गमुखम् प्रधानं स्थानेषु सर्वेष्वधिकारि चैव ॥

Suśruta Samhitā I. vii.

निवर्तते साध्ववगाहते च
याद्य गृह्णात्वोऽहते च यथात् ।
यन्त्रेष्वतः कङ्गमुखं प्रधानं
स्थानेषु सर्वेष्वधिकारि यज्ञ ॥

Aṣṭāṅga Hṛdaya. I. xxv.

curious that in modern times, the European surgeons use a pair of forceps called the Lion forceps for holding bones firmly during operations. So the Makaramukha of Pālakapya is the Crocodile forceps.

2. Vyāghramukha or Tiger forceps: the mouth of this instrument is like that of a tiger (*Tigris regalis*).
3. Vṛkamukha or Wolf forceps (*Canis lupus*).
4. Tarakṣumukha or Hyena forceps (*Hyena striata*).
5. Rkṣamukha or Bear forceps (*Ursus Americanas*).
6. Dwipimukha or Panther forceps (*Felis pardus*).
7. Mārjāramukha or Cat forceps (*Felis domestica*).
8. Śrīgālamukha or Jackal forceps (*Canis aureas*).
9. Airbbāruka or Deer forceps (*Cervus elephas*).

Class II:—The birds, in imitation of whose faces the instruments of this class are made, can be identified from the following discription of their beaks :—

Birds: 1. Raptatories: they have curved beaks hooked at the extremity.

(a) Strigidæ...owls...strong hooked beaks bent down from base.

(b) Vulturidæ...vultures...long straight beaks bent down at tip.

(c) Accipetridæ...falcons, osprey and eagle...short, usually dentated beaks, hooked at the ends.

2. Pessaries...(a) Lanidæ...shrike...hooked and strongly serrated beak. (b) Cervidæ...crow and blue-jay...beaks strong, thick, somewhat curved anteriorly and slightly notched.

3. Grallatories...Heroidæ or Ardeidæ...herons and krauñca...they have long and powerful beaks with sharp hard

edges, somewhat curved at the point, rarely spoon-shaped, with long neck.

The instruments are—

10. Kākamukha or Crow forceps (*Corvus corone*).
11. Kañkamukha or Heron forceps (*Ardea cenerea*).
12. Kuraramukha or Osprey forceps (*Pandion haliaetus*).
13. Cāsamukha or Blue-jay forceps (*Garrulous* or *Corvus cristatus*).
14. Bhāsamukha or Eagle forceps.
15. Śaśaghātīmukha or Hawk forceps (*Nanclerus furcatus*).
16. Ulūkamukha or Owl forceps (*Strix flammea*).
17. Cillimukha or Kite forceps (*Milivus ictimus*).
18. Śyenamukha or Vulture forceps (*Vulture cinereas*).
19. Gr̥dhamukha or Falcon forceps (*Peregrine falcon*).
20. Krauñcamukha (*Ardea jaculator*); or Curlew (*Numenius Arquatus*).
21. Bhr̥ngarājamukha or Fork-tailed or Butcher-bird forceps (*Lanius excubitor*).
22. Añjalikarnamukha—birds not identified.
23. Avabhañjanamukha „ „ „
24. Nandimukhamukha (*Turdus Ginginianus*).

II. The Sandamā or Pincher-like Forceps.

The second class of instruments—the Sandamā¹ or pincher-like forceps—comprises only two instruments : the forceps with and without handles. The first variety is likened

¹ सनिग्रहीतनिग्रहश्च सन्दर्शयो षोडशाङ्कुलौ भवतस्तम्भसिरास्तायुगतशल्योऽप्तारण्यं-
मुपदिश्यते ।

to forceps with arms, used by the barbers for depilating the nasal cavities, while the second variety is like the armless forceps used by the goldsmiths. The former consists of two arms joined crosswise by a pin fixed at about their middle points, and so really is a cruciform instrument but is classed here for its different use in surgery. The forceps without handles consists of two blades soldered at one end. Some commentators like to subdivide the pinchers into two classes according as their ends are rough or smooth. And so Hessler translates:¹ “Duae forcipes denticulata et non denticulata”.

The sandamśas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons². Generally they have a length of sixteen aṅguli.

Vāgbhaṭa II mentions two other instruments as modifications of the type :—

(a) One variety has the length of six aṅguli. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.³

Cakrapāṇi also advises us to use a sandamśa for epilation, which may be called the Epilation forceps.⁴

¹ Hessler's Suśruta. Caput vii. P. 14.

² कौलवङ्ग बियुक्ताग्नौ सन्दंशौ षीड़शाङ्कुलौ ।

लकसिराक्षायुपिश्चित् लग्र श्ल्यपकर्षणे ॥ ५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

अतिग्रस्व श्ल्यस्व सन्दंशेन समुद्धरेत् ।

Hārīta Saṃhitā, III. lvi.

³ षड़शुलोऽन्योहरये सूक्ष्म श्ल्ययो पपच्छाणां ॥ ६ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ See foot-note 2, p. 66.

Similarly in modern times, we remove superfluous eyelashes by the Epilation forceps. Mr. Berry writes¹:—"When the trichiasis is only partial, a temporary improvement is obtained by epilation. In some cases where a few eyelashes only have been left altogether, the patient may procure for himself a pair of forceps, and have the eyelashes removed whenever they cause irritation." Surgical epilation was frequently necessary for trichiasis among the Romans and a similar forceps was in use there.²

In ancient times in India, the barbers used epilation forceps for pulling out grey hairs. In Makha-deva jātaka, we find the following conversations between the king and his barber³ :—

"Barber. There is a grey hair to be seen on your head, O King."

King. Pull it out, then, friend, and put it in my hand.

So he tore it out with golden pinchers, and placed it in the hand of the King."

(b) The second variety is known as the Mucuṭī instrument.⁴ It is a pair of straight forceps, having no curve like that of the sandamśa. It is serrated finely at the open ends. The soldered end has a ring attached to it as ornamentation. It is recommended to be used for removing painful sloughs and proud granulations from a deep-seated abscess. It is also to be used to

¹ Practical Ophthalmology, 1904. By G. A. Berry, M.B. P. 52.

² Paulus Ægineta. VI. xiii. (Syd. Soc. Ed.)

³ Rhys David's Buddhistic jātaka stories, Vol. I, pp. 187.

⁴ मुचुटी सूज दनर्जुमूले रुचकभूषणा ।

गच्छीर ब्रह्मांसात्त्वं चार्यणः श्रीषितस्य च ॥ ७ ॥

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. Suśruta calls it Mucundi¹, and uses it to hold the pterygium after it has been raised by vadīṣa or hook. It must be then a smaller variety of mucuṭī.

A similar pair of forceps, Dr. Erichsen mentions, and says² that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Suśruta mentions barṇabidala³ or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The sandamīṣa instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a sonnā. Those with arms have their counterpart in the sādāsi or a pair of pinchers, still used by the blacksmiths.

III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called Tāla-

¹ अपाङ्गं प्रेचमाणस्य वडिशेन समाहितः ।
सुचुरुद्धर्मूळे मेधावी सूचीसूचेण वा पुनः ॥

Suśruta Saṁhitā, vi. xv.

² Erichsen's Science and Art of Surgery, Tenth Ed. vol. I. p. 342.

³ ताननुत्सिनाभ्यक्तस्य वंशविद्लिनापहरेत् ।

Suśruta Saṁhitā, IV. xxvii.

yantra¹. The word tāla "has been differently interpreted by the commentators. Bhānumatī gives the alternative reading (tālu i.e., palate) for tāla, so the instruments likely had their ends shaped like the palatine process of fish. Dallana,² however, maintains that tāla means picklock, the ordinary Indian key which resembles a hook. Two of these are joined at one end, the curved ends being kept free, facing one another. The instrument would then resemble the face of a bhetuli fish. Instruments with one tāla or hook resemble one lip of the fish, and those with two tālas represent its entire face. Both Cakrapāṇi and Dallana however prefer to mean by tāla, the scale of a fish."

They have a length of twelve aṅguli, and are shaped like the jaws of a fish. They may be made either with a single blade (ekatāla) or with double blades (dvitāla) soldered at one end, the hooked ends being free. They are intended for the purpose of extracting foreign bodies from the ear, nose and other outer canals of the body. The ear scoop now used by the barbers of India for extracting wax from the ear is a tālāyantra.

¹ तालयन्त्रे द्वादशाङ्गुले मत्स्यतालुवदेकतालदितालके कर्णनासानाडीश्ल्यानामा-हरणार्थं ।

Suśruta Saṁhitā, I. vii.

द्वे द्वादशाङ्गुले मत्स्यतालुवदेक तालके ।

ताल यन्त्र स्फूर्ते कर्णनाडी श्ल्यापहारिणी ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² अव ताल-शब्देन प्रदेश उच्यते । एतेन एकं तालं प्रदेशी यस्य तदेकतालं, द्वे ताले प्रदेशी यस्य तत् द्वितालकम् ; एतेन मत्स्यस्य श्ल्यवत्प्रतगुमुखेरप्रदेशं एकतालं मत्स्यश्ल्यवत् प्रतगुमुखं द्विप्रदेशं द्वितालमित्युक्तम् । परिणाहस्यु कर्णादिप्रवेशी ज्ञेयः । अन्ये तु मत्स्यतालकवदेकतालकदितालके इति पठति । व्याख्यानयति च मत्स्यव भेटुनिमत्स्यः, तस्य लौहमयतालकाकारं मुखं भवति अतस्मुखाङ्कारं यन्त्रमितालकं, सर्वमुखाकारं द्वितालकं, तालकोऽत्र अपवारकादिपाठसम्बिन्द्यन्तं लौहमयमुख्यते ।

For removing substances that have fallen into the meatus auditorius, Paul says:¹ "They must therefore be extracted by an earpick, a hook, or tweezers, or by using powerful shaking of the head, while the ear is placed upon some circular board." Albucasis recommends us to use a slender forceps, which resembles the modern dissecting forceps. He also commands for the purpose a hook slightly bent, which is also mentioned by Celsus.²

IV. The Nādi Yantra or Tubular Instruments.

The Nādi or tubular instruments are described to be of various kinds and to serve many purposes³. They are open either at one or both ends. These are used for the extraction of foreign substances from the natural outlets of the body. They are also recommended to be used as a diagnostic apparatus for inspection of diseases in the canals. They are the means of sucking out fluid discharges, as pus etc., from cavities and they facilitate the performances of other operations. They vary in length and diameter in proportion to the different sizes of the outer canals of the body, or according to the varieties of purposes to be served by them.

¹ Paulus Aegineta, Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² Celsus, VI.

³ नाड़ी यन्त्राणेकप्रकाराणेक प्रयोजनान्वेकतोमुखान्युभयतोमुखानि च तानि स्त्रीती-गतश्ल्योङ्गारणार्थं रोगदर्शनार्थमाचूषणार्थं क्रियासौकार्यार्थाद्वेति तानि स्त्रीतङ्गपरिष्णाहानि यथायोग परिष्णाहदीर्घाणि च ।

Suśruta Saṁhitā, I. vii.

नाड़ीयन्त्राणि शुष्पिराणे कानेक मुखानि तु ।

स्त्रीतीगतानां शल्यानामामयानाच्च दर्शने ।

क्रियाणां सुकरलाय कूर्यादाचूषणाय च ।

तद्विक्षार परिष्णाह दैव्यं स्त्रीतीञ्जुरीधतः ॥ ८ ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

The tubular instruments are used for fistula-in-ano, haemorrhoids, tumours, abscesses, injections into the rectum, vagina and urethra, hydrocele, ascites, inhalations, stricture of urethra and rectum and cupping as by gourd and horns.¹

As examples of the tubular instruments, Vāgbhaṭa II. mentions:—

1. KANTHASALYĀVALOKINI² OR THROAT SPECULUM.

To examine foreign substances such as a fish-bone in the throat, the instrument should have a length of ten āṅguli and a circumference of five āṅguli.

Suśruta describes the extraction of a foreign body, made of lac from the throat of a patient by the following device. A heated iron probe or sound should be introduced into the throat of a patient through a tube of copper and made to touch the bit of shellac. The foreign substance would begin to dissolve or soften and so will adhere to the probe. The rod is then to be cooled by sprinkling water through the tube and the foreign body then should be drawn out steadily with it.³ But other kinds of foreign bodies are to be extracted from the throat by means of a rod-like instrument, one end of which is smeared with melted wax or shellac.

The use of some adhesive substance for extraction of foreign bodies accidentally introduced into the outer passages of the

¹ भग्नदरार्जीर्व्वदन्तणवस्तुप्रचरवल्लिमूचडिकोदरधूमनिरुद्धप्रकाशसन्निरुद्धगृदयन्दाण्य-
लावृशङ्गन्यनाणि चीपरिष्ठावद्यामः।

Suśruta Saṃhitā, I. vii.

² दशाङ्गुलार्डनाहान्. कण्ठश्ल्यावलोकिनी।

Aṣṭāṅga Hṛdaya, I. xxv.

³ जातुषे कण्ठासके करणे नाडौं प्रवेश्याग्नितपाच्च श्लाकां तथावगृह्य श्रीताभिरङ्गः
परिषिच्य स्थिरीभूतमुद्भरेत्। अजातुषे जतुमधूच्छिष्टलिपया श्लाकया पूर्वकरपेनिवेके।

human body was well known to the Greeks and Romans. Paul says:¹ "Stones and such like bodies we extract by wrapping wool round an earpick, and smearing it with turpentine-rosin, or some glutinous substance, and introducing it gently into the meatus auditorius."

2. PAÑCAMUKHA AND TRIMUKHA.

To take a good hold of a four-eared arrow, a speculum having five holes (PAÑCAMUKHA) should be had recourse to; and for a two-eared arrow, a speculum having three holes (TRIMUKHA) would be necessary. The central hole is for the arrow, while the side holes are meant for the ears of the arrow.²

Celsus³ says that when a weapon buried in the flesh has barbs too strong to be broken with forceps, they may be shielded with split writing-reeds (Calamus scriptorium), and the weapon thus withdrawn.

Paul says: "Some apply a tube round about the barbs⁴ so that when they draw out the weapon, the flesh may not be torn by the barbs."

In modern times a snare is used instead of a tube. Dr. Erichsen⁵ writes: "The extraction of an arrow is usually attended with little difficulty. But if barbed, special precautions have to be taken. With the view of safely effecting its removal, the snares.....have been devised."

¹ Paulus Aegineta. Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² नाडीपञ्चमुखचिद्रा चतुर्कर्णस्य संयहे ।

वारङ्गस्य द्विकर्णस्य चिच्छिद्रा तत् प्रभाणतः ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ Celsus. vii. v.

⁴ The Works of Paulus Aegineta. vi. lxxxvii.

⁵ The Science and Art of Surgery. Vol. I. pp. 343.

3. TUBULAR INSTRUMENTS FOR INSPECTION OF ARROWS.

Again for the inspection of the arrows, various kinds of tubular instruments would be necessary, which will vary according to the shape, length, and circumference of the arrows and their ears.¹

4. ŚALYANIRGHĀTANI.

The top of this tubular instrument is shaped like the disc of a lotus and is closed. The other end is open and leads to a hollow extending to a fourth part of the tube. It has a length of twelve anguli. It is useful for removing an arrow fixed deeply into the body, in different directions and thus helping its easy extraction.² For this purpose Suśruta directs us to use a stone hammer.

The Śalyanirghātani had its counterpart in the female part of the Impellent, mentioned by Paul, for forcing an arrowhead forwards through a part so as to extract it at the side opposite to that of its entrance. It would thus be seen that the function of the Impellent was similar to that of the Śalyanirghātani ; the former moved it forwards, while the latter moved the śalya side to side, the object of both being to extract the foreign substance. The Impellent would seem to have been a plain rod of metal pointed at one end (the male part) and hollowed at the other (the female part) ; the pointed end used to be introduced into the socket of an arrow when it possessed one; and the hollow

¹ वारङ्गं कर्णसंस्थानं नाहृदैर्घ्यानुरीधतः ।

नाडीरेवं विधाश्वान्या द्रष्टुं शल्याणि कारयेत् ॥ १० ॥

Aṣṭāṅga Hṛdaya, I. xxv.

² पश्चकर्णिकया मूडिं सटशी इदशाङ्कता ।

चतुर्थं शुषिरानाडी शल्यनिर्घातनी मता ॥

Ibid.

end was meant to fit over the tail in case where the arrow was tanged.¹ The Greeks and Romans recognised the necessity of an arrow being moved about until loosened, if it remained fixed in the bone; and Celsus² directs us to strike it with some iron instrument until it be shaken from the place where it is lodged.

5. TUBULAR INSTRUMENTS FOR PILES.

According to Suśruta³ these should be made either of iron, or ivory, or horn or wood. They are hollow instruments tapering at the end which should be shaped like the teat of a cow. For males, the length is four aṅguli, while the circumference is five aṅguli. In the case of females, however, the tube should be made wider, the circumference being six aṅguli, and longer, the length being equal to the space covered by the palm of the hand. There are two slits on the sides—one for inspection of diseases and the other to allow application of caustic and cautery to the diseased part. The slit measures three aṅguli in length and the pulp of the thumb in breadth. At a distance of a half aṅguli from the margin of the slit, is raised a circular projection, also a half aṅguli high.

¹ Paulus Aegineta, VI. lxxxviii.

² Celsus, VII. 5.

³ तत्र यन्त्रं लौहं दान्तं शार्ङ्गं वार्चं वा गोक्षनाकारं चतुराङ्गुलायतं पञ्चाङ्गुलपरिणाहं पुंसा षड्ङुलपरिणाहं नारीणां तलायतं तदिच्छिद्रं दर्शनार्थमेकं छिद्रमेकं छिद्रन्तु कर्त्तव्ये। एकद्वारे हि शत्रुचाराघैनामतिक्रमी न भवति। छिद्रप्रमाणन्तु वद्गुलायतमङ्गुष्ठोदर-परिणाहं यद्गुलमवशिष्टं तस्याङ्गुलमधस्तादर्द्धाङ्गुलीच्छितोपरिभृत्यकर्णिकमेषयन्त्राक्रान्ति-समाप्तः।

Vāgbhaṭa¹ describes two different instruments, one for inspection and the other for medication. They both have the same length and circumference. The former has two slits on the side, while the latter has only one slit, three aṅguli long and the pulp of the thumb in width. The annular projection is turned upwards : the object being the prevention of sudden introduction of the instrument too far inwards.

A similar instrument without any slit on the side is called Śamī². It is advised to be used for exerting pressure over the piles by its introduction into the rectum (Vāgbhaṭa.)

Rectal speculum is mentioned by Hippocrates in his treatise on fistula³ and by Paul in the treatment of piles.⁴ It is called Calopter in contradistinction to the vaginal speculum which is called Diopter. The rectal speculum in the Naples museum is a two bladed instrument working with a hinge in the middle. In modern times, both the varieties of the speculum, tubular and valved, are in use.

For inspection and medication of piles, a tubular speculum is recommended to be used by the veterinary surgeons. In the

¹ अर्शसां गोक्षनाकारं यन्त्रकं चतुरङ्गुलम् ।
नाहे पञ्चाङ्गुलम् पुंसां प्रमदानां षडङ्गुलं ।
दिक्षिद्रं दर्शने व्याधेरीकच्छिद्रतु कर्मणि ।
मध्येऽस चतुरङ्गुलच्छिद्रमङ्गुष्ठोदर विसृतम् ।
अङ्गुलीचित्तीवृत्त कर्णिकव्य तदूडृतः ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

² शम्याख्यां तादृगच्छिद्रं यन्त्रमर्शः प्रपीडनं ॥ १३ ॥

Ibid.

³ The Genuine Works of Hippocrates. (Syd. Soc. Ed.) Vol. II. P. 817.

⁴ Paulus Aegineta, VI. lxxix.

Aśvavaidyaka, Jayadatta sūri¹ describes the instrument thus : "The surgeon should know the instrument to have the length of six aṅguli. On the two sides, the wise surgeon should make two slits, three aṅguli long and a half aṅguli broad. Through an instrument with two slits, the piles of the horses should be examined. Through a speculum with one slit, the surgical operations, such as incisions &c., should be performed, after having tied the horse and making him lie down".

6. TUBULAR INSTRUMENTS FOR FISTULA-IN-ANO.

These are similar to the instruments used for the inspection and medication of piles, the only difference being the omission of the circular rings in their construction, for otherwise, the projection may rub over the sore if the speculum be introduced deeply.²

¹ यन्त्रं षडङ्गुलं विदान् च्छिद्रं पञ्चाङ्गुलं भिषक् ।

अधोऽर्द्धाङ्गुलाविस्तीर्णं दैध्ये गायाङ्गुलवयम् ॥

उभयोः पार्श्योऽस्त्रं कुर्याच्छिद्रद्वयं बुधः ।

अर्शसेन तु वाहस्य विच्छिद्रेण विलोकयेत् ॥

एकच्छिद्रेण वै कर्म कुर्याच्छेददिपूर्वकम् ।

पातितस्य सुवज्जस्य तुरङ्गस्य विचच्चणः ॥

Aśvavaidyaka (Bibliotheca Indica). Liii. vs. 4, 5 and 6.

² छिद्रादूर्धं हरेदोषमर्शयन्वस्य यन्त्रवित् ।

ततो भग्न्दरे दद्यादेतद्वैन्दु सविभं ॥

Suśruta Saṃhitā, IV. viii.

सर्वथाऽपनयेदीष्टं छिद्रादूर्धं भग्न्दरे ।

Aṣṭāṅga Hṛdaya, I. xxv.

7. TUBULAR INSTRUMENTS FOR THE NOSE.

Nasal-Speculum.

Similar tubular instrument without ring is to be used for examination of nasal diseases as tumours and polypus. It is however shorter and thinner than the rectal speculum. Vāgbhaṭa says: "It is two aṅguli long and admits the index finger in its lumen. The tube has a single slit on the side."¹

He describes nasal tubes for introducing medicated powders into the nose as snuff.² After partially filling the tube with powders, one should blow through the empty end, the other end being put well inside the nasal cavity. Suśruta also uses a tube to blow powder into the nose.³ Caraka⁴ mentions nasal insufflation to cure diseases. Śāringadhara⁵ and Cakradatta⁶ describe the nasal tube for insufflation to be six aṅguli long and open at both ends.

¹ नाद्यार्बुद्धार्शसामेकच्छिद्रा नाद्याऽङ्गुलहया ।

प्रदेशिनी परिणाहा स्थाहगन्दर यन्ववत् ॥ १५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

² भानं विरेचनशूर्णो युज्ज्ञात् तं सुखवायुना ।

षडङ्गुलहिमुखया नाद्या मेषजगर्भया ।

Ibid. I. xx.

³ नासास्वावे न्राणतश्चूर्णमुक्तां नाद्यादेयं योवपीडशतीक्षः ।

Suśruta Saṃhitā, VI. xxiii.

⁴ सिङ्गि स्थान्नाबनं चूर्णच्छेषं प्रधमणे हितं ।

Caraka Saṃhitā, VI. xxvi.

⁵ षडङ्गुला हिवक्ता या नाडी चूर्णलयो धर्मेत् ।

तौक्षं कोलमितम्बक्तं वातैः प्रधमनं हितं ॥

Śāringadhara Saṃgraha, III viii.

⁶ आपनं रेचनशूर्णो युज्ज्ञात् तत् मुखवायुना ।

षडङ्गुल हिमुखया नाद्या मेषजगर्भया ॥

Cakradatta, Nasyādhikāra.

Aretaens says that a quill or reed or a wide long tube may be used for blowing powders into the pharynx. Alexander Trallianus² says that a calamus scriptorium, the joints of which have been removed, may be used as an insufflator. Oribasius³ however gives the fullest description of the tube used as a nasal insufflator. "A reed slender and with a straight bore, 6 inches in length, and of such a size that it can be passed in the nares, is taken and its cavity entirely filled with medicament. The reed may be either natural or of bronze. This being placed in the nares, we propel the medicament by blowing into the other end."

In modern times, we advise our patients to do the same thing when powders are prescribed to be thrown into the nose or ears. The cylindrical shaft of the ordinary quill so cut as to be open at both ends will serve the purpose admirably. The nasal insufflator is used now for identical object.

Aretaeus⁴ mentions a nasal syringe with a double tube. It consists of two pipes united together by an outlet so that liquid medicine may be injected into both the nasal cavities simultaneously, for injection into each nostril separately, he points out, can not be borne.

It is remarkable that in Mahāvāgga⁵ mention is made of single and double nose-spoons. Nāthu-karapi (*i.e.*, an instrument to hold up the nose, so that the medicated oil

¹ Aretaeus, Vol. II., P. 408.

² Alexander Trallianus, IV. viii.

³ Oribasius Collect, xii.

⁴ Aretaeus, Ed. Adams, Vol. II., P. 459.

⁵ Mahāvāgga, VI. 13. 1 & 2. Sacred Books of the East.

does not run out...Ed.) and Yamaka-nāthu-karani (i.e., one that would go up both nostrils...Ed.). They are recommended to be made of gold, or silver, or bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of chank-shell". (Sacred Books of the East).

To apply oily medicines inside the nasal cavity a cotton wick is first soaked in the oil and then it is pushed well inside the nose. It is recommended also to pour oil into the cavity through a tube, while the other cavity is pressed by a finger (*Vāgbhata*¹).

To treat a case of fracture of the nasal bones, Suśruta recommends² two straight tubes open at both ends to be introduced into the nasal cavities, after putting the fractured ends in position, either lowering or elevating the raised or depressed end by a rod as required. Then bandages are to be applied. The tubes serve as splints to support the broken ends in position, while through their orifices the patient may breathe without inconvenience.

Similarly Celsus, after replacing the fractured ends in position uses oblong tents sewed round with a thin soft skin as splints into the nostrils; or a large quill smeared with gum, or artificer's glue may be applied in the same way. Paul also

¹ नासापुटं पिधायेकं पर्थ्यायेण निषेचयेत् ।
उष्णास्तु भेषज्यं प्रनाद्या पितृनाऽथवा ॥

Aṣṭāṅga Hṛdaya, I. xx.

² नासां सद्र्वा विड्वां वा कृज्वौ कृत्वा श्लाकया ।
पृथग् नासिकयीनाद्यौ दिमुखौ संप्रवेशयेत् ॥
ततः पट्टेन संवेद्य घृतसेक' प्रदापयेत् ॥

says: "And some sew the quills of the feathers of a goose into the rags, and thus introduce them into the nose, in order that they may preserve the parts in position without obstructing the respiration; but this is unnecessary as respiration is carried on by the mouth."¹

Sūśruta also advises us to introduce these tubes into the nasal cavities during the performance of the Rhinoplastic operations.²

8. THE AṄGULI-TRĀṄAKA OR FINGER-GUARD.

Vāgbhaṭa says:³ "It is generally made either of ivory or wood. The instrument is shaped like the teat of a cow, and is four aṅguli long. Two slits occur on the sides like those in the speculum for piles."

It protects the finger of the surgeon from being injured by the teeth of the patient and so helps the surgeon in opening the mouth of the patient with ease.⁴

In modern times, finger-guards are used for the same purposes.

¹ Paulus Aegineta, Vol. II. vi, xci. Syd. Soc. Ed.

² सुसंहितं सम्यगदो यथावद्राष्टौद्येनाभिसमीक्ष्य वहा ।

प्रोन्नत्य चैनामवचूर्णयेत् पत्तङ्गयष्टीमधुकाञ्जनैश्च ॥

Sūśruta Saṁhita, I. xvi.

³ अङ्गुलिवाणकं दानं वार्चं वा चतुरङ्गुलम् ।

दिक्षिद्रं गीक्षनाकारं तद्विविहौमुखं ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ तत्र वक्त्र विष्टौ, सम्बृद्ध त सुखस्यातुरस्य सुखव्यादान निमित्तं सुखं सुखकरं स्थात् ।
यत इदं दन्तघातात् रक्षति अत उक्तं सुखमिति ।

Vāgbhaṭārtha Kaumudi, I. xxv.

अङ्गुलिदेन्तेभ्यो रक्षणार्थलांदङ्गुलिवाणकमिति नाम ।

Sarvāṅga Sundari, I. xxv.

9. JONI-VRĀNEKṢĀNA OR VAGINAL SPECULUM.

Vāgbhaṭa¹ describes it to be a tubular instrument, sixteen aṅguli long, and six aṅguli in circumference. It consists of four blades, attached at their bases to a ring. The tube tapers gradually, the end is free and looks like the bud of a lotus. To the four blades are soldered four rods in such a way that on pressing their free ends, which pass out of the ring, by the surgeon's hands, the tapering end of the tube would gape widely. The surgeon by regulating the pressure of his hand, may open or close the speculum to any desired extent.

Another kind of vaginal speculum used to be manufactured out of the two horns of a buffalo by dividing each into two longitudinal halves. They should be so paired that their concave surfaces would look towards one another, their ends diverging outwards. So we get a pair of bivalve speculum out of a pair of horns.

The bivalve speculum of horn mentioned above, has its modern counterpart in the pair of speculum known as Barne's or Neugebauer's speculum.

¹ योनिब्रयेक्षणं मध्ये शुषिरं घोडशाङ्गुलम् ।

मुद्रावद्धं चतुर्भिंचमधीज मुकुलामनं ।

चतुःश्लाकमाक्रान्तं मूले तदिकसेन्मुखे ॥ १७ ।

Aśtāṅga Hṛdaya, I. xxv.

अस्य यन्त्रस्य कर्त्त्वनाथां चत्वारिंखण्डानि तथा कार्याणि यथा सुद्रिकथा वज्ज्ञानि मिलितानि च पद्ममुकुलाकार सुखा, अन्तर शुषिरा षडङ्गुल परिणाहवती नाड़ी स्थात् । ततस्मध्ये प्रलेकं खण्डसंलग्नं चतुर्सः श्लाकाः आमुखात् सन्दिवेश्य श्लाकानामध्यभागे तथा वज्ञीयात् यथा श्लाकामूल पौड़नेन यन्त्रस्य सुखं विकसेत ।

The vaginal speculum or Diopter is mentioned by Soranus, Paul¹ and other Greek surgeons. Paul describes its method of working as follows:— “The person using the speculum should measure with a probe the depth of the woman’s vagina, lest the stalk (fistula) of the speculum being too long, it should happen that the uterus should be pressed upon. If it be ascertained that the stalk is larger than the vagina, folded compresses are to be laid on the alæ pudendi, in order that the speculum may be placed upon them. The stalk is to be introduced, having a screw at the upper part, and the speculum is to be held by the operator, but the screw is to be turned by the assistant, so that the laminæ of the stalk being separated, the vagina may be distended.” The accounts given by Albucasis² and Haly Abbas³ are similar. These instruments are described to be bivalve, trivalve or quadrivalve. A quadrivalve speculum of the Greeks is identical with the Joni-vranekṣaṇa of the Hindus; the only difference being that the former is acted by screw mechanism, while the latter is worked on the principle of the lever. Drawings of several shorts of the Greek instruments are given in the surgery of Albucasis and by Schultet.⁴ There are three specimens of vaginal, speculum in the Naples museum, drawings of which are given by Milne. In modern times, we use similar valvular speculum for identical purposes.

¹ Paulus *Ægineta*, Vol. II. vi. lxxiii. Syd. Soc. Ed.

² Albucasis, Chirrug, II. 71.

³ Haly Abbas, Pract. ix. 57.

⁴ Arsenal de chirrug. tab. 18.

10. TUBULAR INSTRUMENTS FOR WOUNDS.

Vraṇa-vasti or Wound-syringe.

If the wound be caused by deranged air and be very tender, especially if it forms on the lower half of the body, the vasti should be used. In diseases of the urinary organs, such as, obstruction of urine, faulty conditions of urine, impure semen, stone in the bladder and disorders of menstruation, uttara-vasti is necessary.¹

There are two instruments mentioned—one for application of oleaginous medicines to a sore and the other for washing a sinus with medicated lotions. Each consists of a tube and a leather bag. The tube is smooth and rounded and is shaped like a cow's tail.² It is six anguli long. The base is broad and admits a thumb, while the end is narrow and admits a pea. There is a circular projection or ring at a short distance from the end. The base is fitted tightly into a bag of thin leather.³

¹ वातदुष्टो ब्रणोयस्यु रुक्षाश्वर्थवेदनः ।
अधःकायि विशेषेण तत वस्तिर्विधीयते ।
मूत्राधाने मूवदोषे शुक्रदोषेऽश्मरौप्रयोगे ।
तथैवार्तवदोषे च वस्तिरप्युत्तरो हितः ॥

Suśruta Saṁhitā. IV. i.

² नाड़ी ब्रणानां स्त्रेहप्रयोगार्थं प्रचालनार्थञ्च हे यन्ते आह यन्ते इत्यादि नाड़ीब्रणाभ्यङ्गं चालनाय नाड़ीब्रणानामभ्यङ्गार्थं प्रचालनार्थञ्च षडङ्गुले षडङ्गल दीर्घे, वस्तियन्ताकृति वस्ति-नेवाकारे हन्ते गोपुच्छाकारे

* * * *

Vāgbhaṭārtha Kaumudī, I. xxv.

³ यन्ते नाड़ी ब्रणाभ्यङ्गं चालनाय षडङ्गुले ।
वस्तियन्ताकृति मूलेऽङ्गुष्ठ कलायचे ।
अग्रतः कर्णिके मूले निवङ्गस्तुचर्मणी ॥ १८ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv

To prevent the tube slipping out of the bag, an additional precaution is taken by tying a knot of thread over the leather covering the tube. For description of the bag, *vide infra*.

Sāringadhara¹ however says that the tube should have the thickness of the shaft of a vulture's feather and should admit a moong (Phaseolus Moong). It is eight aṅguli long.

Pālakāpya describes the tube for washing wounds of elephants to be made of copper, and shaped like the karontaka flower. It is sixteen aṅguli long.

In modern times, wound syringes are similarly used to wash the sore with medicated lotions.

For description of the tubes for vṛana-dhupana or wound-fumigation, *vide infra*.

11. TUBULAR INSTRUMENTS FOR ASCITES.

Dākodara yantra or Canula.

It may be either metallic or manufactured from the cylindrical hollow calamus of a peacock's feather.² The tube is open at both ends and is of the same calibre throughout. Suśruta advises us to use a pipe of tin, or lead or a feather to drain the fluid, after the abdomen has been tapped.³

¹ ब्रणवस्तु नेव स्यात् शक्तमस्ताङ्गुलोऽप्सितम् ।

मुहूर्च्छिदग्नपत्रपत्तिकापरिणाहि च ।

Sāringadhara Saṃgraha, III. vi.

² दिङ्डारा नलिका पिञ्जनलिका वा दाकोदरे । १६ ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

³ तत्र वप्तादीनामन्यतमस्य नाडौदिङ्डारां पचनाडीं वा संयोज्या दोषोदक-भवसिच्छेत्तो नाडौमपहृत्य तैललवणेनाभन्य व्रशवस्त्रेनोपचरित् ।

Suśruta Saṃhitā, IV. xiv

Celsius describes a lead or copper canula for draining ascites.¹ Paul writes that the tip used to be bevelled off like a writing pen.² It was also employed in empyema.³ Albucasis⁴ mentions a tube of silver or copper or brass having a small hole at the bottom and three on its sides.

In modern times we use a metallic canula of similar shape for draining fluid in ascites.

12. TUBULAR INSTRUMENTS FOR HYDROCELE.

This is practically the same instrument described above. Suśruta⁵ mentions a tube or canula to drain the fluid after tapping the hydrocele with the vṛihimukha śastra or trocar. The Greek surgeons did not describe the operation. They preferred the open incision to puncture.⁶ Rhases, however, describes the operation of puncturing the scrotum for hydrocele.⁷

13. TUBULAR INSTRUMENTS FOR URETHRAL STRICTURE.

Suśruta recommends gradual mechanical dilatation of the urethra by means of tubes made of iron, or wood, or lac, well-smeared

¹ Celsius, vii. 15 & ii. 10.

² Paulus Aegineta, Vol. II. VI. L. Syd. Soc. Ed.

³ Hippocrates, ii. 259.

⁴ Albucasis, Chirrug, ii. 54.

⁵ मूतजां स्वेदयित्वात् वस्त्रपट्टेन विष्टयेत् ॥

सेवन्याः पार्श्वं तोऽधस्ता विष्टेद्वैहिसुखेन च ।

अथात विसुखां नाडीं दद्वा विस्तावयेद्भिषक् ॥

Suśruta Saṁhitā, IV. xix.

⁶ Paulus Aegineta, VI. lxii.

⁷ Rhases, Cont. xxiv.

with ghee.¹ He advises us to use the same tube for three consecutive days, then another of larger calibre for three days more, and so on, till the canal be fully dilated. He reserves External Urethrotomy as a last resource.²

14. TUBULAR INSTRUMENTS FOR RECTAL STRICTURE.

Suśruta similarly describes gradual dilatation of stricture of the rectum, using a higher number of dilators after the lapse of three days until the desired effect is attained.³

¹ (a) निरुद्धप्रकाशे नाडँौं लौहीमुभयतोमुखौं ॥

दारवी वा जतुक्तां घटाभ्यक्तां प्रवेशयेत् ।

परिषेक वसामञ्ज शिशुमारवराहयोः ॥

चक्रतैलं तथायोज्यं वातन्नप्रव्यसंयुतं ।

व्रह्मान्नाहात् स्थूलतरां सम्युद्नाडँौं प्रवेशयेत् ॥

श्रीतोविवर्द्धयेदेवं क्षिरधमनन्न भोजयेत् ।

भिलावा सेवनों मुक्तां सद्यः चतुवदाचरेत् ॥

Suśruta Saṁhitā, IV. xx.

(b) निरुद्ध प्रकाशे नाडँौं विमुखीम् कनकादिजम् ।

चिप्राभक्ता चुल्कादिजेहेन परिषेचयेत् ।

तैलेन वा वचदारुकल्कैः सिङ्गेन च व्रह्मात् ॥

पुनः स्थूलतरा नाडँौदेया खोतोविरुद्धये ।

...

... ... कुडगुदेऽप्येष क्रियाक्रमः ॥

Cakradatta, Kṣudraroga Cikitsā.

See also Yogaratnākara, P. 368, where these verses are quoted.

² See I (a). अस्यार्थः—सेवनौ व्यङ्गा शस्त्रैण वा मूत्रस्रोतः संकोचकारणं च स्वदारयेत् । तस्यापि द्वारस्याविपाटे मणिः दारमध्ये वं दारयेदिति ।

Commentary of Śrī Kaṇṭha in Vyākhyā Kusumāvalī (Anandāśram Series), P. 406.

³ सन्निरुद्ध गुदे योज्या निरुद्धप्रकाशक्रिया ॥

Suśruta Saṁhitā, IV. xx.

There is no mention of solid bladder sounds in the Sanskrit medical books. But from the above descriptions, it seems beyond doubt that they had a set of dilators for stricture of the urethra and another set of dilators for stricture of the rectum. These dilators were tubes—either metallic or wooden—and had a regular gradation in the increase of their diameters. Cakrapāṇī mentions stricture dilators of gold.¹

In modern times we have also two sets of these instruments—urethral and rectal dilators, numbered in an ascending series according to the increased diameters of these instruments.

15. TUBULAR INSTRUMENTS FOR INJECTIONS INTO THE RECTUM.

Vasti yantra or Rectal Clyster.

Injections into the rectum are to be thrown by means of a tube with a membranous bag tied to its end. The tube is advised to be made either of gold, or silver, or lead, or copper, or brass, or bell-metal, or ivory, or horns, or glass, or precious stones, or wood or bamboo. It should be clean, smooth, strong, and tapering like a cow's tail, and should terminate in a smooth rounded bulb. The tube varies in length and circumference according to the age of the patient as follows:—

I. Caraka.²

Age.	Length of tube.	Opening at the end admits.
6 years ...	6 anguli ...	A moong
12 " ...	8 " ...	A pea
20 " and over ...	12 " ...	A small plum seed

¹ See foot note I (b), Page 124.

² सुवर्णसूच्यन्तप्रताम्बरैति

कांस्यायसास्थिदुमवेणुदन्तैः ।

नलिविषषाणैर्मणिभिश्च तेऽस्ते:

कार्याणि नेवाणि मुकर्णिकानि ॥

II. Suśruta.¹

Age.	Length of tube.	Part of tube in bag.	Circumference of tube.	Circumference at end.	Measnre of injection.
1 year	6 anguli	1½ anguli	Little finger	Shaft of heron's feather.	2 añjali
8 "	8 "	2 "	4th "	Shaft of falcon's feather.	4 "
16 "	16 "	3½ "	3rd "	Shaft of peacock's feather.	8 "
50 "	12 "	3 "	Pulp of thumb	Admits a plum stone.	12 "
70 "	Same as that of the 16th year.				

षड् द्वादशाष्टाङ्गल समितानि षड् विश्विद्वादशर्वजानाम् ।

स्यमङ्गकर्कन्ध सतीनवाहिच्छिद्राणि वर्त्यापिहितानि चापि ॥

यथावयोऽह्नेषु कनिष्ठकाभ्यां मूलाययोः स्युः परिणाहवन्ति ।

कृजुनि गोपुच्छसमाकृतीनिःश्वानि च सर्वगडिकासुखानि ।

स्यात् कर्णि कौकाय चतुर्थभागे मूलाश्रिने वस्ति निवन्धने चै

जारहवैभाहिष्ठारिणो वा साक्षीकरो वस्त्रिरजस्य वापि ॥

दृढ़सन्नर्णशिरो विगत्यः कषायरक्तः समुद्रः सशङ्खः ।

नृणां वशीवौज्ञा यथानुरूपं निवेष योज्यस्त् सवद्धमतः ॥

Caraka Saṁhitā, VIII, iii.

Also quoted in Cakradatta. Anuvasanādhikāra.

¹ तद सांवत्सरिकाद्विरष्ट वर्षाणां षड्एष्टदशाङ्गुल प्रमाणानि कनिष्ठिकानामिका मध्यम-
ङ्गुलि परिशाहान्वयेऽध्यर्द्धाङ्गुलार्द्दि टृतीयाङ्गुल सन्निविष्ट कर्णिकानि कङ्कश्चेन वर्हिपञ्च नाडी-
तुल्य प्रवेशानि मुद्रमाषकलायमाव सोतांसि विद्यान्नेचाणि तेषु त्वास्यापनाद्रव्य प्रमाणमातुर
हस्तमन्मिनेन प्रस्तेन सम्भितौ प्रस्तौ द्वैचत्वारोऽट्टौ विधेयाः ।

भवति चात्र ।

वर्षोत्तरिष नेत्राणां वस्तिमानसा चैव हि ।

वयोवलश्वरीराणि समीक्षा वर्जयेद्विधिं ॥

पञ्चविंशतिरुद्धं द्वादशाङ्गुलं मूले ह्रुष्टोदर परिणाहमये कनिष्ठिकोदर परिणाहमये वाङ्गुल-
सन्निविष्ट कर्णिक' गृह्यपचनाडीतुल्य प्रवेश कोलास्थिमाच' च्छ्रदं क्लिन्कलाथमाच' छिद्रमित्येके ।
सर्वानिमूले वस्त्रिनिवस्थनार्थं द्विकर्णि कानि । आस्थापन द्रव्य प्रमाण' तु विहिता द्वादश प्रसृताः ।
सप्तनेत्सर्वं नेत्र प्रमाणमेतद्वद्व्य प्रमाणन् द्विरक्षवर्षवत् ।

तव नेचाणि मुवणैरजततामयोरौति दन्तश्छमणितहसारमशनि स्नचानि डृढानि
गोपुच्छकातीन्द्राजुनि गुटिका मुखानि । वस्त्राश्वाबङ्गानां स्तद्वो नाति वहला डृढाः प्रमाणवन्नो
गोमहिषवराहा जीरभाणा ।

III. Vâgbhaṭa II.¹

Age. (years).	Length of tube.	Opening at base admits.	Opening at end admits.
Under 1	5 aṅguli	1 finger	A moong (phaseolus moong).
1 to 6	6 "	1½ "	A masha (phaseolous Rox).
7 to 11	8 "	2 "	A kalâya (pea) (pinus sativum).
12 to 15	9 "	2½ "	Boiled pea.
16 to 20	12 "	3 "	A śîgalakoli (zizyphus crenoplia).
over	varies according to the age, strength and size of the patient; but the orifice at the base of the tube need not be wider.		

नेवलामे हितनाडौ नलबंशस्थि सम्भवा ।

वस्त्रलामे हितं चर्मं सूक्ष्मं वा ताल्वं घनम् ॥

वस्ति निरूपदिग्धन्तु शुद्धं सुपरिमाजितं ।

सृजनुद्धत द्वैनच्च सुहःखे हविर्महितं ।

नेवमूले प्रतिष्ठाप्य नुजन्तु विष्वताननम् ॥

Sûsruta Samhitâ, IV. xxxv.

१ तयोस्तु नेवं हेमादि धातु दार्ढिस्य विनुजं ।

गोपुच्छाकारमच्छिद्रं श्वस्त्रार्जुं गुडिका मुखं ॥

जनेऽद्दे पञ्चपूर्णे स्त्रिनासप्तभ्योऽङ्गलानि घट् ।

सप्तमे सप्त तान्यष्टौ द्वादशे घोड़शे नव ।

द्वादशैव परं विंशाद् वीचार वर्षान्तरेषु च ।

वयो वल शरीराणि प्रमाणमभिवद्येत् ॥

साङ्गः एन सप्तसूले स्थौल्येनाग्ने कनिष्ठया ॥

पूर्णे ऽद्दे ऽङ्गुल मादाय तद्वर्णं प्रवर्जितं ।

चप्पङ्गुलं परमं किद्रं मूलेण्ये वहने तु यत् ।

सुङ्गं माषं कलान्तु स्त्रिन् कर्कस्युकं क्रमात् ॥

मूलं च्छिद्रं प्रभाणेन प्रान्ते घटित कर्णिं कं ।

दर्याय पिहितं मूले यथास्त्रं द्वाङ्गुलान्तरं ।

कर्णिका द्वितयं नेवे कुर्यात् तत्र च योजयेत् ॥

अजावि महिषादीनां वस्ति सुस्फुटितं दृढं ।

कषाय रक्तं निच्छिद्रं यन्यि गन्धं शिरं तनुं ।

यथितं साधुसूवेण मुखं संस्थाप्य भेषजं ।

वस्त्राऽभावेऽङ्गपादं वा न्यसिद्वासोऽथवा घनं ॥

Aṣṭāṅga Hṛdaya Samhitâ, I. xix.

Cakradatta¹, Śāṅgadharā and Bhāva Miśra² follow Caraka as regards measurement. Kharaṇāda³ also gives a similar description.

¹ See foot note 2, Page 125.

² नेत्रं कार्यं सुवर्णादिधातुभिहच्चवेणुभिः ।
नलैहृत्तैविषाक्षणैर्मणिभिर्वा विधीयते ॥
एकवर्षात् षड् वर्षं यावन्मानं षड्ज़ुलम् ।
ततो द्वादशकं यावन्मानं स्थादटसंमितम् ॥
ततः परं द्वादशभिरज्ञुलैन्चदौर्घता ।
सुद्राक्षिद्रं कलायाभं क्लिद्रं कोलास्थिसन्निभम् ॥
गोपुच्छसन्निभं मूले स्थूलं तस्मात् क्रमात् क्षारं ।
यथासंख्यं भवेन्नेवं शूलं गोपुच्छसन्निभम् ॥
आतुराङ्गुष्ठमानेन मूले स्थूलं विधीयते ।
कनीष्ठिकापरीणाहमगे च गुटिका सुखे ॥
तमूले कर्णिके वे च कार्ये भागाच्चतुर्थकात् ।
योजयेत् तत्र वस्तिच्च वस्त्रद्वयविधानतः ॥
सृगाजशुकरगां भहिषस्यापि वा भवेत् ।
भूत्तकोशस्य वस्तिस्तु तदलाभे च चर्मणः ॥
कषायरक्तः सुभद्रवस्तिः स्त्रिघो द्विहितः ।
ब्रणवस्तेस्तु नेत्रं सगात् श्वत्त्वमष्टाङ्गुलोन्मितम् ॥
सुद्धच्छिद्रगृप्रपचनलिकापरिणाहि च ।

Śāṅgadharā Saṅgraha, III. v.
Bhāva Prakāśa, I. ii.

³ वस्तिनेत्रस्तजु शुक्रं सदृच्छुलिकासुखम् ।
भवेत्त्रिपुच्छसंस्थानं सुप्रवाहं तिकर्णिकम् ।
या विभागप्रश्यवने मर्यादा कर्णिका भवेत् ।
वे कर्णिके चोपरिष्ठाहस्त्राधारिद्यवालरे ।
साङ्गुष्ठकपरीणाहं मूलं नेवस्य शस्त्रे ।
भध्यं त्वामिकातुत्यमग्नं तुत्यकनिष्ठिकं ।
स्वे नाङ्गुलि प्रमाणेन दैर्घ्यं स्थाद् द्वादशाङ्गुलम् ।
कर्कन्त्युप्रवहच्छिद्रं शेषमन्त्यथावयः ।

Hārīta¹ advises us to use a bamboo tube four aṅguli long, which is to be introduced into the rectum up to two aṅguli.

As a general rule, Caraka writes that the broad and the narrow ends of the tube are to be equal to the patient's thumb and little finger respectively, in circumference. The orifice at the end of the tube is to be kept closed by a wick, so that no foreign body may enter the lumen of the tube to occlude it. The plug may be easily removed when the tube is required for use, and then replaced.

Towards the narrow end of the tube is a projection or ring at a distance of about two aṅguli from the extremity. The height of the projection varies with the size of the tube at the base. It acts as a bar to the further introduction of the tube inside the rectum than required. Towards the base are two similar projections, two aṅguli apart from each other. To the one near the base is firmly tied the leather bag, so that the tube may not slip away suddenly during forcible compression of the bag. The other is meant to afford a firm grasp by the surgeon, so that the tube may not move during its introduction into the rectum. These projections are to be made of thread or a piece of cloth and are to be so shaped as to resemble the end of the proboscis of an elephant.

As regards the leather bags, they are recommended to be

विश्वादशषड्वर्षे वादशाष्टषड्जङ्गुलम् ।

कर्कन्धूक सतीनायसुखं विद्रवहम् ॥

Kharanāda quoted in Sarvāṅga Sundarī, I. xix.

¹ चतुरङ्गुलां बेणमयो नाडौ प्रतिलक्षणं कृता तथा वस्तिप्रतिकर्मं कुर्यात् । * * * गुदाभ्यन्तरे द्वाङ्गुलमात्रं नाडौ सञ्चारयेत् सुधीः ।

made of the bladder of cows, or buffaloes, or hogs, or goats, or lambs. The bladder is to be well cleaned first with lime and water, so that no unpleasant smell may be emitted by the decomposition of its muscular tissue, then dyed red with Mañjiṣṭhā (*Rubia Cordifoliatum*) or with Harītakī (*Terminalia Chebula*, Retz.) and thoroughly dried. The bags are recommended to be soft, durable, entire and capacious. If the bladders of these animals are not available, the bags are to be manufactured from a frog's skin, or the peritoneum (one-fourth part would suffice) of any beast, or a piece of leather or a piece of very thick cloth. The size of the bag varies according to the age of the patient. It is to be firmly tied over the first projection at the base of the tube.

In the Siddhisthāna Chapter XI of the Caraka Saṁhitā,¹ there is a passage showing that veterinary medicine was well-known to the ancient Hindus at a very early period. This portion was edited by Dr̥dhabala and it is impossible to decide whether the passage refers to Agniveśatantra or not. It runs as follows:— “Then the disciples asked: ‘How are clysters to be made in cases of animals such as elephants, camels, cows, horses, lambs and goats?’ To this, the sage Ātreya explained the clysters for

¹ अपृच्छदेनं सचवस्तिमत्रवीत् विधिच्छतस्याह पुनः प्रचोदितः ।
अजाविकेसौम्य गजोऽश्वयोर्बा गवाश्वयोर्वस्तिसुशान्तिभाहिषम् ॥
अजाविकादन्तमुवस्तिसुत्तरं वदन्ति वस्ति विपरीतस्यम् ॥
सुवस्तिमटादशशोऽश्वाङ्गुलं तथैवनेतत्र दशाङ्गुलं क्रमात् ॥
गजोऽश्वयोऽश्वाव्यजवस्ति सन्धौ चतुर्थभागे च सकर्णिकं वदेत् ।
प्रस्थस्त्वजाव्योर्हिं निरुहमात्रा गवादिषु विविशुणो यथा वलम् ।
निरुह उद्यस्त तथादकडयं गजस्त्वं विज्ञस्त्वनुवासनेऽष्टमः ॥

animals in the following manner. The leather bag of the vasti-yantra should be made of a buffalo's bladder for goats, lambs, elephants, cows, camels and horses. The vasti for these animals is known as suvasti and uttara-vasti as uttara-suvasti. The tube of the suvasti should be eighteen aṅguli long for elephants and camels, sixteen aṅguli for cows and horses, and ten aṅguli for goats and lambs. Like the vasti yantra used for men, it should have a projection at the junction (of the tube with the bladder) and another at the fourth division of the tube from the end."

In the Aśvavaidyaka¹ the tube for the horse is thus described : "The tube should be made either of wood, or metals, or horn, or bamboo, or reeds. Its length should be twelve aṅguli and circumference six aṅguli. The wise surgeon should make the tube of such a calibre as to allow a plum seed to pass through it easily. It should be straight, polished and tapering from the base. At a distance of four aṅguli from the end of the tube, a projection should be raised, while for tying the leather bag firmly to the tube, two projections ought to be constructed at the base".

Pālakāpya² describes the rectal clisters for elephants. He advises that these are to be made either of wood or bamboo. The end is bulbous and the surface smooth. The length

¹ काष्टैर्दण्डस्योभिश्च प्रङ्गवंशनलादिभिः ।
दादशाङ्गुलदीर्घन्तु परिणाहे षडङ्गुलम् ॥
कोलास्यमावच्छिद्धन्तु कुर्यान्नेत्रं विचक्षणः ।
मूलादनुकम शूक्ष्ममसृष्टान्तु विशेषतः ।
त्वक्त्राङ्गुलानि चत्वारि कर्णिकान्तस्य कारयेत् ।
पुटकस्यप्रवन्धाय मूले दे चापि कर्णिके ॥

Aśvavaidyaka, XVI. vs. 2—4.

² Pālakāpya's Hasti-Āyurveda, Sec. IV. Ch. V.

length of the tube varies, the most convenient being sixteen aṅguli for men and sixty-eight aṅguli for elephants. The projections at the base of the tube should be twelve aṅguli high. He describes in detail the method of introduction, position of the elephant, etc.

Dṛḍhavala advises us to reject the following eight kinds of tubes and eight kinds of bags¹ :—

I. Tubes—

1. *Hrasva* or too short : For the injection does not reach the proper place.
2. *Dirgha* or too long : For the injection passes beyond the proper place.
3. *Tanu* or too thin : The injection can not pass through the tube easily and so the bag may burst.
4. *Sthūla* or too thick : The tube pulls the mucous membrane of the rectum and anus backwards and forwards during its entrance and exit.
5. *Jirna* or old, weak and delicate : The tube may break inside the rectum during its introduction and so cause injury to the gut or anus.

¹ ऋस्वं दीर्घं तनुस्थूलं जीर्णं शिथिलवन्धनम् ।
पार्श्वच्छिद्रं तथा वक्रमण्डौ नेवाणि वर्जयेत् ॥
अप्राप्तातिगतिचोभकषणचणनस्वाः ।
गुदपीड़ा गतिजिह्वा तेषां दोषा यथाक्रमम् ॥
मांसलच्छिद्रविषमस्थूलजालकवातलाः ।
क्षिन्नः क्षिन्नश्च तानष्टौ वलीन् कर्मसु वर्जयेत् ॥
गतिवैषम्यविस्तलस्वाव्यदौयात्त्वनिस्वाः ।
फेनिलच्छूतधार्यैत्वं वस्तः स्वाद वस्तिदोषतः ॥

6. Śithilabandhana : The tubes do not fit the bags well, so during compression of the bags, the injected fluid runs out by the side of the tube.
7. Pārśvacchidra or leaky : Having slit on the side, the tube may injure the soft parts by rubbing against them.
8. Bakra or curved : The motion of the injected fluid would be curvilinear. It will strike a side of the rectum and so would not go inside the gut.

II. Bags—

1. Maṁsala or fleshy : The bag emits bad smell.
2. Chidra or leaky : The injection escapes outside.
3. Viṣama or uneven : Parts are unequally compressed and so the injection does not issue in a forcible jet.
4. Sthūla or thick : It is difficult to grasp the bag and so it can not be forcibly compressed.
5. Jālaka or having a network : The injection comes out.
6. Vātala or hollow, airy and incompressible : If air can not be expelled out, froth forms in the injection ; and so air is pumped into the rectum.
7. Chinna or torn : The injection flows down.
8. Klinna or ^{कृष्ण} crooked : The injection can not be forced out.

Suśruta mentions eleven defects of tubes and five defects of bags of the Vasti yantra.¹

¹ अतिस्थुलं कर्कशमवनतमणभिन्नं सन्निकाष विप्रकाष कर्णिकं सूक्ष्मातिच्छद्रमतिदीर्घं भविहस्तमित्येकादश नेवदोषाः । वहस्तात्यता सच्छद्रता प्रसीर्णता दुर्बिज्ञतेति पञ्चवस्ति दोषाः ।

I. Tubes—

- | | | |
|--------------------------|---------------------|---|
| 1. Atisthūla : | Too thick. | Such tubes injure the rectum and so cause pain. |
| 2. Karkaśa : | Rough. | |
| 3. Avanata : | Curved. | |
| 4. Anu : | Too thin. | It becomes useless to inject fluids into the rectum. |
| 5. Bhinna : | Broken. | |
| 6. Sannikṛ̥ta Karnika : | Projection near? | |
| 7. Viprakṛ̥ṣṭa Karnika : | Projection distant? | Injure the rectum which bleeds. |
| 8. Sūkṣma : | Small orifice. | It becomes difficult to inject as the fluid comes out. |
| 9. Atīrasva : | Too short. | |
| 10. Atīchidra : | Large orifice. | Too much fluid passes into the rectum and so pain is complained of. |
| 11. Atidīrgha : | Too long. | |

II. Bags—

- | | | |
|------------------|-------------------|--|
| 1. Vahalatā : | Fleshy. | It is difficult to tie the bags over the tubes properly. |
| 2. Prastīrṇatā : | Large. | |
| 3. Sacchidratā : | Perforated. | No fluid can be forced into the rectum and so the instrument is useless. |
| 4. Durvvidhatā : | Difficult to tie. | |
| 5. Alpatā : | Small. | |

गुदे भवेत् चातं रुक् च साधनं पूर्ववत् मृतं।

आसन्न कर्णिके नेवे भिन्नेऽणौ वायपार्थकः ॥

अवसेको भवेद्दस्तेस्तमादोषान्विवर्जयेत् ।

प्रकट कर्णिके रक्तं गुदमर्थं प्रपीडनात् ॥

चरत्वापि पित्तज्ञो विधिवसिष्ठं पिच्छिलः ॥

ऋस्वेत्युत्तोतसि च क्षेत्रे वसिष्ठं पूर्ववत् ॥

प्रत्यगच्छंसतः कुर्याद्विगान्वस्ति विघातान् ।

दैर्घ्यं महास्तोतसि च ज्ञेयमत्यवपीडवत् ॥

प्रस्तीर्णं वहले चापि वस्त्रौ दुर्ब्बलं दोषवत् ।

वस्त्रावल्पेऽल्पता चापि द्रव्यस्ताल्पगुना मताः ॥

दुर्ब्बले चाणु भिन्ने च विज्ञेयः भिन्ने निवेदत् ।

16. UTTARA-VASTI.

Urethral, Vaginal and Uterine Tubes.

Injections into the urethra and vagina are also recommended to be thrown in by similar contrivances : the tubes being adopted in length and circumference to the length and breadth of the passages for which they are intended.

1. Tubular Instruments for the Urethra.

The tubes intended for applying medicines into the male urethra is recommended to be twelve aṅguli long. Suśruta¹ advises us to use tubes fourteen aṅguli long. It is to be made of gold and is called Puṣpanetra. Its circumference is equal to that of a stalk of flower of Jātī (Jasmimum Grandiflorum) or Mālatī (Echites Crayophyllata, Rox.), and the lumen of the tube allows a mustard seed to pass through it. It is provided with an annular projection just at the central part. Caraka² says that

¹ वस्तीरुचरसञ्चयविधि वच्चग्राम्यतःपर' ॥
 चतुर्दशाङ्गुलं नेवमातुराङ्गुल सम्मितम् ।
 मालतैपुष्पदन्तायं क्षिद्र' सर्षप निर्गमम् ॥
 मेद्रायामसमं केचिदिच्छन्ति खलु तद्विदः ।
 स्त्रेह प्रमाणं परमं कुच्छाव प्रकौचितः ॥
 पच्चविंशादधोमावां विदध्याद बुद्धिकल्पिताम् ।
 निविष्टकर्णिकं मध्ये नारीणां चतुरङ्गुले ॥
 मूत्रस्रोतः परीणाहं सुङ्घ वा हि दशाङ्गुलं ।
 तासामपत्यमार्गं तु निदध्याच्चतुरङ्गुलम् ॥
 ङ्गुलं मूत्रमार्गेतु कन्धानां त्वेकमङ्गुलम् ।
 विशेयं चाङ्गुलं तासां विधिवद्वक्षते यथा ॥

Suśruta Samhitā, IV. xxxvii.

² पुष्पनेत्रञ्ज हैमं स्यात् सूक्ष्मामौत्तरवस्थिकम् ।

it has two projections while Vāgbhaṭa¹ describes three. The bag is to be made of goat's bladder. A probe is first passed into the urethra to examine its condition and then the tube is introduced up to the length of six aṅguli. The bladder which contains the injection and which is tied tightly round the tube, is then compressed to force the fluid into the urethra. The tube of course, varies in size according to the dimensions of the organs of generation.

For the female, the puṣpanetra is described to have the length of ten aṅguli. The projection is at a distance of four aṅguli from the base. The circumference of the tube varies according to the width of the urethral canal. The calibre of the tube allows a moong to pass through it.²

जातौपुष्पस्य व्लनेन समं गोपुच्छसंस्थितम् ।

रौप्यं वा सर्षपच्छिद्रं द्विकर्णं द्वादशाङ्गुलम् ॥ ४६ ॥

Caraka Saṃhitā, VIII. ix.

¹ आतुराङ्गुलमानेन तन्रेत्रं द्वादशाङ्गुलं ।

वृत्तं गोपुच्छवत् मूल सध्ययोः ह्रत कर्णिकं ।

सिद्धार्थक प्रवेशाय शूच्चां हे भादि सध्यवं ।

कुन्दाश्वमार सुमनः पुष्पहन्तीपमं दृढं ।

तस्य वस्त्रिमूर्दुलघुर्मात्रा शुक्तिर्विकल्प्य वा ॥

* * * *

नेत्रं दशाङ्गुलं सुङ्गप्रवेशच्चतुरङ्गुलं ।

अपत्यमार्गं योज्यं स्याद्वाङ्गुलं मूलवर्त्मनि ॥

मूलकाञ्चिकारिषु वालाना सेकमङ्गुलम् ।

Aṣṭāṅga Ḥṛdaya Saṃhitā, I. xix.

² पुष्पनेत्रं प्रमाणन्तु प्रमदानां दशाङ्गुलम् ।

मूलखोतः परौणाहं मूलखोतोऽनुवाहि च ॥

गर्भमार्गं तु नारीणां विधेयं चतुरङ्गुलम् ।

इग्नुलं मूलमार्गं तु वालाद्या स्त्रे कमङ्गुलम् ॥

Caraka Saṃhitā, VIII, ix

Catheters.

It is curious to find no description of so important an instrument as the catheter. Injections were thrown into the urethra but the tube used was always a straight one, having the length of six anguli; so it could not possibly have reached the bladder in the male, and nowhere has the claim been put forward for it to have done so. The tube might have served well for the females. The female catheter of the Greeks, as preserved in the Naples museum, is 0·98 mm. long and is straight throughout (Milne).

In the Atharvaveda Samhitā,¹ however, we find a hymn, unmistakably alluding to the use of catheter in ancient times.

Against obstruction of urine with a rod.

"This hymn is intended to be 'used in a rite for regulating the flow of urine'. The reed implies some primitive form of a fistual urinaria, the vastiyautra (one of the nādiyantrāni) of the late physicians—who however do not appear to have made frequent uses of it".

* * * * *

6. What in thine entrails, thy (two) groins, what in thy bladder has flowed together—so be thy urine released, out of thee with a splash ! all of it. (In the groin are two vessels located in the two sides affording access to the receptacle of urine).

7. I split up thy urinator, like the weir of a tank—so be thy urine released, out of thee, with a splash ! all of it.

8. Unfastened (be) thy bladder orific, like that of a water-

¹ Book 1. 3. Whitney's translations and annotations.

holding sea—so be thy urine released, out of thee, with a splash ! all of it.

9. As the arrow flew forth, let loose from the bow,—so be thy urine released, out of thee, with a splash ! all of it”.

2. Tubular Instruments for the Vagina.

Similarly injections were thrown into the vagina. The vaginal tube should be thicker than the urethral tube and in circumference should be equal to that of the little finger. It should be introduced into the vaginal canal up to a distance of four aṅguli, whereas into the urethra, the tube was allowed to enter up to a distance of two aṅguli only in the adults and of one aṅguli only in the girls.¹

3. The Uterine Tubes.

The uttara-vasti comprises the urethral syringe—male and female—and the vaginal and uterine clysters. No distinct uterine tube is described in the text books. But Suśruta² says

¹ द्वादशाङ्गुलकं नेवं मध्ये च कृतकर्णिकम् ।

मालतिपुष्पवच्चाभस्किद्रं सर्षपनिर्गमम् ॥

* * * *

स्त्रीणां कनिष्ठिकास्थूलं नेवं कुर्याद्वादशाङ्गुलम् ।

मुहूरप्रवेश्य योज्यत्वं योन्यन्तश्चतुरङ्गुलम् ॥

द्वादशाङ्गुलं मूत्रमार्गं च सूक्ष्मं नेवं नियोजयेत् ।

मूत्रकञ्जकविकारेषु वालानामेकमङ्गुलम् ॥

Sāringadhara Samhitā, III. vii.

Bhāva Prakāśa, I. ii.

² उर्ध्वजान्वै स्त्रियै दद्युदुचानायै विचक्षणः ।

कल्पतरस्य कण्ठायै दद्यात् सुमदु पौडितं ।

विकर्णिकेन नेवेन दद्यायोनिमुखं प्रति ।

गर्भाशय विशुद्धार्थं स्त्रेहेन दिगुणेन तु ।

अप्रत्यागच्छति मिष्टकं वस्त्रावृत्तरसंचिते ।

that to apply uttara-vasti to a female, she is advised to lie supine, keeping her knees flexed and well raised. For a girl the quantity of injection is one prasrta.

To purify the uterine cavity, apply a clyster of twice the quantity of oleaginous medicines, inside the vagina by means of a tube having three rings. If after the application, the oily medicine does not flow out, then apply a second clyster containing medicines of the group called śodhana or purifiers, into the rectum ; or let the clever surgeon introduce a probe into the space of the clyster ; or press under her navel deeply by his closed fist. As the object of the injection is to clean the cavity of the uterus, there can be no doubt that a uterine tube is referred to in the passage. Again the precautions recommended if the injections do not come back easily, point to a uterine tube to have been used, for injections into the vagina can not be delayed in coming out. The Hindu writers often confounded the intra-uterine and urethral injections with the vaginal clyster. Caraka¹ says : “The uttra-vasti is to be used for the females during the period of menstruation, for then the uterus, being in a condition fit for impregnation, has its mouth open and so can easily be reached by the injection.” This shows that uterine medication to be the object aimed at by the clyster.

भूयो वस्ति विद्यातु संयुक्तं शौधनैर्गण्यः ।
गुदे वत्ति निद्याहा शौधनद्रव्यं संभृतां ।
प्रवेशादा मतिभान्वस्तिद्वारमथैषणीम् ।
पौड्येद्वाप्यधीनामेर्वलेनोचरमुष्टिना ।

Suśruta Samhitā, IV. xxxvii.

¹ स्त्रैणाच्चार्चवकाले तु प्रतिकर्म तदाचरेत् ।

गर्भासना सुखं स्थेहं तदादत्ते छ्यपावता ॥

गर्भं योनिसदा शीत्रं जिते गटज्ञाति मारुते ॥

The Greeks were no better, for Milne also complains: "It is difficult to separate ancient descriptions of injections into the vagina from those into the uterus, for the terms for the two parts are frequently interchangeable." Again he says: "It is probable that at other times under the heading of 'injections of the bladder', only irrigation of the urethra is meant".¹

18. TUBULAR INSTRUMENTS FOR INHALATIONS AND FUMIGATIONS.

The tubes for smoking were made, like the vasti tubes, of various metals, or glass or wood. Caraka² describes it as a straight tube having three pouches. The end of the tube is equal in diameter to that of a plum seed. Śāringadhara³ adds that a reed or bamboo pipe will also serve the purpose. It is described as a straight tube, the broad base of which admits the patient's thumb while the narrow end, a plum seed. Suśruta⁴ describes the base

¹ Graeco-Roman Surgical Instruments, P. 107-8.

² चतुर्विंशतिकं नेत्रं स्फङ्गुलीभिर्विरेचने ।

द्वाविंशदङ्गुलं स्फेहे प्रयोगे चार्डभिष्यते ॥

कर्जुविकीषफलितं कौलास्थग्नप्रभाणितम् ।

वस्त्रिनेत्रं समद्रव्यं धूमनेत्रं प्रशस्यते ॥ १६

Caraka Saṁhitā, I. v.

³ धूमनाडी भवेत्तत्र विखण्डा च निपर्विका ॥ १०

कनीषिका परीणाहा राजमाषागमान्तरा ।

धूमनाडी भवेद्वैर्धा शमने रोगिणोऽङ्गुलैः ॥ ११

चत्वारिंशन्मितैस्फङ्गुलाविंशङ्गिर्मृदौ स्फृता ।

तौत्त्रे चतुर्विंशतिभिः कासन्ने षोडशेन्मितैः ॥ १२

दशाङ्गुलिर्वामनीये तथास्याद्वरणाडिका ।

कलायमरण्डलायूला कुलायागमरन्धका ॥ १३

Śāringadhara Saṁhitā, III. ix.

* तत्र वस्त्रिनेत्रद्रव्यैर्धुमनेत्रद्रव्याणि व्याख्यातानि भवन्ति । धूमनेत्रस्तु कनीषिका परिणाहमये कलाथमावं स्फोटोमूलैऽङ्गुष्ठपरिणाहं धूमवर्ति^५ प्रवेश स्फोटोऽङ्गुलान्वय चत्वारिंशत् प्रायोगिके । द्वाविंशत् स्फेहने । चतुर्विंशतिर्वैरेचने । षोडशाङ्गुलं कासन्ने वामनीये च ।

and end of the tube to be equal in circumference to that of the thumb and little finger respectively. The orifice should allow a common pea to pass easily through the tube. Vāgbhaṭa¹ says that there are three pouches or dilatations of the tube, shaped like the half-open buds at equal distances from each other. The tube is supposed to consist of four equal parts. The first pouch is located at the end of the first part, the second and third pouches at the ends of the second and third parts respectively. Cakradatta² also describes it similarly.

Dṛḍhabala³ mentions another method of inhalation. He makes a paste of the medicines prescribed and smears it on a piece of silk cloth. This is then to be rolled round like a wick. This wick is to be dipped in ghee before use, and fire lit at one end, while the patient is to smoke it through the other end.

एते अपि कोलास्थिमात्रं स्किद्रे भवतः । व्रणनेत्रमष्टाङ्गुलं व्रणधूपनार्थं कलायपरिमण्डलं
कुलत्यवाहिं स्वीत इति ।

Sūrūpa Saṁhitā, IV. xl.

¹ वस्ति नेत्रं सम द्रव्यं विकोषं कारयेद्गु ।

मूलाऽग्नेषु द्वा कोलास्थि प्रवेशं धूमनेत्रकां ।

तीक्ष्णं स्तेहनं मध्येषु वीणि चत्वारि पञ्च च ।

अङ्गुलीनां क्रमात् पातुः प्रमाणे नाष्टकानि तत् ॥ ६ ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxi.

² कृजुचिकोषफलितं कोलास्थयप्रमाणितम् ।

वस्तिनेत्रसमद्रव्यं धूमनेत्रं प्रशस्यते ।

साईस्त्वंशयुतः पूर्णोहस्तं प्रायोगिकादिषु ।

नेत्रे कासहरे वंशहीनः शेषे दशाङ्गुलः ॥

Cakradatta, Dhūmapānādhikāra.

³ प्रपुन्डरीकं मधुकं शार्दूलां समनःशिलाम् ।

सरिचं पिपलौ द्राचामिलां सुरसमञ्जरीम् ॥

कृत्वा वर्त्ति पिवेषु मधुमचिलानुवर्त्तिताम् ।

षट्काक्रामनु च चौरै गुडोदकमथापिवा ॥

Caraka Saṁhitā, VI. xxii.

Both Caraka¹ and Śāringadhara² advise us to make tubes of medicines, the fumes of which are advised to be smoked in the following manner:—Powder the medicaments and make a paste; measure one karsa; take a smooth reed (*Saccharum sara*, Rox.) twelve aṅguli long. Apply the paste round the reed, for a length of eight aṅguli. Dry it in shade. Remove the reed, leaving a dried tube of the paste. When required for smoking, light one end of the tube with a burning wick and smoke through the other end.

Caraka³ describes another inhaler, which consists of two earthen basins (*soraba*) placed upon each other, their edges being pasted with flour. The upper one is perforated at the centre for the reception of one end of the tube, the patient puts the other

¹ पिदा लिम्पेच्छरेष्ठीकां तां वर्त्ति यवसत्रिभां ।

अङ्गुष्ठसम्भितां कुर्यादिष्टाङ्गुलसमां भिषक् ॥

शुष्कां निर्गम्भां तां वर्त्ति धूमनेत्रार्पितां नरः ।

स्त्रेहाक्तमप्रिसंस्तुष्टां पिवेत् प्रायोगिकीैँ सुखाम् ॥ ६ ॥

Caraka Saṁhitā, I. v.

² अथेषिकां प्रचिपेच्च सुशक्त्ता॑ द्वादशाङ्गुलाम् ।

धूमद्रव्यस्य कल्पेन लिपश्चाङ्गुलः स्फृतः ॥

कल्कं कर्षभितं लिपा व्याया शुष्कच्च कारयेत् ।

इषिकामपनीयाय स्त्रेहाक्तां वर्त्ति मादरात् ॥

अङ्गारैर्दीपितां कल्पा धृत्वा नेत्रस्य रन्ध्रके ।

वदनेन पिवेङ्गुम् वदनेनैव संबजित् ॥

नासिकाभ्यां ततः पौत्रा सुखेनैव वसित् सुधीः ।

Śāringadhara Saṅgraha, III. ix.

³ सधूच्छिष्टं सर्जरसं धृतं सज्जकसंपुटे ।

कल्पा धूमं पिवेच्छृङ्गं वालं वा स्नायु वा गवाम् ॥

श्योषाकवर्ज्ञमानानां नाडौं शुष्कां कुशस्थ वा ।

Caraka Saṁhitā, VI. xxi.

end into his mouth for inhalation. The lower pot contains glowing charcoal of catechu (*Accacia catechu*. Linn.) wood, over which are put pills of necessary medicines. The tube is from eight to ten anguli long.¹ This inhaler is intended for phthisical subjects. It is useful for allaying cough and exciting emesis. This instrument is called *mallaka sampūta* or *sorāba sampūta* or a pair of earthen basins. In such an apparatus Caraka recommends us to put^{*} powders of cow's horn, hairs, nerves and ligaments, besides other medicines. Suśruta², Vāgbhāṭa³ and Cakradatta⁴ also describe it. Śāringadhara⁵ however reserves this instrument for fumigating wounds only.

The length of the pipe will vary according to the different kinds of smoking prescribed by the physician. There are five kinds of smoking narrated :—

1. Śamana, madhya, proyogika—medium.
2. Brīmhana, snehana, mṛdu —mild.

¹ दशाङुलोन्मितां नाडीं अथवाष्टाङुलोन्मिताम् ।

शरावसंपुटच्छिद्रे क्षत्वा जिङ्गां विचचणः ॥

दैरेचनं सुखिनैव काशवान् धूमसापिवेत् ।

Caraka Saṃhitā, VI. xxii.

² इतरयोर्ब्यपेत धूमोङ्गार स्थिरे समाहिते शरावे प्रचिप्य वत्ति॑ मूलच्छिद्रेणान्वेन शरावेण पिधाय तम्भिन् च्छिद्रे नेव मूलं संयोज्य धूमसासेवेत् ।

Suśruta Saṃhitā, IV. xl.

³ शराव सम्पुटच्छिद्रे नाडी वस्त्र दशाङुलां ।

अष्टाङुलां वा वक्रेण काशवान् धूमसापिवेत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxi.

⁴ अथवा सष्टुतान् शक्तून् क्षत्वा भस्त्रिकासम्पूटे ।

नवप्रतिश्यायवतां धूमं वैद्यः प्रयोजयेत् ॥

Cakradatta, Nāsāroga Cikitsā.

⁵ See foot-note 2. P. 145.

3. Recana, śodhana, tīkṣṇa — strong.
4. Kāsaghna — anti-cough.
5. Vāmana — emetic.

So the length of the tube would vary thus—

1. Caraka.¹

				Āṅguli.
In strong smoking	24
„ medium „	32
„ mild „	96

2. Suśruta.²

In medium smoking	48
„ oleaginous „	32
„ brain-sedative „	24
„ anti-cough or emetic „	16

3. Vāgbhaṭa.³

In strong smoking	24
„ medium „	32
„ mild „	40

4. Śāringadhara.⁴

In medium smoking	40
„ mild „	32
„ strong „	24
„ anti-cough „	16
„ emetic or wound-fumigation	10

FUMIGATION.

Similarly wounds are said to be purified by suitable medicinal fumigation. In the purification of wounds by fumigation, we get a glimpse of the antiseptic method of treatment in its

¹ See foot-note 2. P. 140.

³ See foot-note 1. P. 141.

² See foot-note 4. P. 140.

⁴ See foot-note 3. P. 140.

embryonic form. Suśruta¹ recommends the tube to be eight aṅguli long and to have the circumference of a common pea; and its orifice should be of the size of a kulattha (*Dolichos biflorus*, Linn.). The fumes of medicated substances from the inside of any closed pot containing fire, pass out through the tube and are allowed to play on any sore to purify it. For this purpose two earthen pots—sorāha sampuṭa—may conveniently be used as before. Śāringadhara² uses a tube ten anguli long and recommends us to use Nimba leaves (*Azadirachta Indica*) for wound-fumigation. As another instance of the application of the principles of antiseptic methods to practical therapeutics, we may mention the use of medicinal injections into the cavity of the uterus to rectify its morbid conditions.³

A similar instrument was used to fumigate the uterus and vagina in various diseases of these parts. “Fumigation”, says Suśruta,⁴ “is to be applied to the vagina by burning the

¹ ब्रणनेवमटाङ्गुलं ब्रणधूपनार्थमकलायपरिमङ्गलं कुलत्यवाहिषोतडिति ।

Suśruta Saṃhitā, IV. xl.

स चौमधवसर्पिंभिंधुपनाहैश्चधूपयेत् ।

Ibid. IV. i.

² दशाङ्गुलिर्वामनीये तथासपाद ब्रणनाडिका ।

कलाय मङ्गलस्थूला कुलत्यागमर्त्युका ॥१३

* * *

शरावसम्पुटे चिद्वा कल्कमङ्गारदीपितम् ॥१७

छिद्रे नेत्रे निवेश्याय ब्रणनेव धूपयेत् ।

* * *

ब्रणे निष्ववचाद्यच्च धूपनं स प्रशस्ते ।

Śāringadhara Saṃgraha, III. ix.

³ See foot note 2, P. 1318.

⁴ सर्वसङ्गे तु योग्यं धूपयेत् क्षणसर्पिनम्बैकेण पिण्डौतकेनवा ।

Suśruta Saṃhitā, III. x.

slough of a snake (*Bungarus*) or pinditaka (?) wood, in cases of obstructed delivery of the foetus. Caraka¹ mentions fumigation of the vagina by burning Bhurjapatra (*Betula Bhojpatra*), glass, precious stones and the slough of a snake as one of the means for removing the placenta. To remove the after pains and difficulty in micturition and defaecation, Suśruta² advises us to fumigate the vagina. He recommends fumigation of the uterus with purifying medicines. In fumigating these parts, the Hindu surgeons desired a local action, and did not share in the belief, held by some of the Greek gynaecologists³ that "the uterus was an animal within the body which could wander about, being attracted by pleasant smells and repelled by disagreeable smells".⁴ The Arabs also did not believe uterus to be an animal. This method of treatment was well known to the Greeks ; for Hippocrates⁵ writes that "fumigation with aromatics promotes menstruation and would be useful in many other cases, if it did not occasion heaviness of the head". He "directs us to take a vessel which holds about four gallons and fit a lid to it so that no vapour can escape from it. Pierce a hole in the lid, and into this aperture force a reed about a cubit in length so that the vapour cannot escape along the outside of

¹ भूर्जपत्रकाचमणि सर्पनिम्बोक्तैश्चासा योग्यं धूपयेत् ।

Caraka Saṁhitā, IV. viii.

² कटुकालादुक्रतवेधन सर्षप सर्पनिम्बोक्तैर्बा कटुतैलविमिश्चैर्योनिसुखं धूपयेत् ।

Suśruta Saṁhitā, III. 2.

³ Aretaeus. Morb. Acut. ii. 11.
Plato's Timeas.

⁴ Graeco-Roman Surgical Instruments. P. 158.
Adan's Commentary on Paulus Aegineta, Vol. I. Bk. ii. P. 636-37.

⁵ See also in the Hippocratic treatises, as Nat. Mul. vii, 9; 1 Morb. Mul. xvii. 1; II Morb. Mul. xl. 20, 21; Steril. vi. 3; Superfæt. ix. 3, 2. 9, II.

the reed. The cover is then fixed on the vessel with clay."¹ Oribasius² and Soranus³ used similar instruments for the purpose.

DISINFECTION OF ROOMS, CLOTHES, etc.

Caraka⁴ says that if peacock's feather, bones of vaka bird, white mustard and red sandal wood, well powdered and mixed with ghee, be used in fumigation, the poison of a room, beddings, seats and clothes, is got rid of. Śāringadhara⁵ advises us to disinfect a sick room by the fumes caused by burning the following substances with ghee : peacock's feather, Nim leaves (Melia Azadirachta), Vrihati, pepper, asafoetida, Jotāmāṁsi (Nardostachys jotamansi), seeds of Sālmalī (Bombax malabaricum), goat's hair, slough of a serpent, cat's faeces and ivory. Suśruta⁶ advises fumigation of a sick room for a surgical patient for

¹ Græco-Roman Surgical Instruments P. 159.

² Coll. xix.

³ Soranus. xxiii.

⁴ शिखिवर्हवलाकास्थीनि सर्षपाश्वने च घृतयुक्तः ।

धूमो रद्धशयनासनवस्त्रादिषु शस्यते विषनुत् ॥५६॥

Caraka Samhitā, VI. xxv.

⁵ मथूरपिच्छं निम्बसप्त पवाणि हृष्टीफलम् ।
मरिचं हिङ्गं मांसी च वौजं कार्पाससम्भवम् ॥
क्षागरोमाहिनमर्मोकं विषा वैडालिकी तथा ।
गजदलश तच्चूर्णं किञ्चिहृत विभिश्रितम् ।
गेहेषु धूपनं दत्तं सर्वन्वालग्रहाङ्गयेत् ।
पिशाचान् राचासञ्जिला सर्वज्वरहरो भवेत् ॥

Śāringadhara Samgraha, III. ix.

⁶ सर्षपारिष्टपवाभ्यां सर्पिन्धा लवणेन च ।
विरन्ह कारयेहूर्धं दधरावमतन्द्रितः ॥

Suśruta Samhitā, I. xix.

ten days, morning and evening, after the operation has been performed.

15. TUBULAR INSTRUMENT FOR CUPPING.

Generally cow's horn is recommended for the purpose. It is eighteen anguli long, its base, forming the mouth of the instrument, is three anguli wide (*Vāgbhaṭa*).¹ It is conical in shape and the cone is said to be either curved or straight. The other end is pointed and perforated to the extent of allowing a mustard seed to pass through it. The narrow end, however, is made to assume the shape of a woman's nipple by winding thread round it. This facilitates the operation of suction by the mouth of a surgeon when the broad end is placed against any diseased area of the patient's body. Suśruta² mentions its use in blood-extraction. For extracting blood, the part must be scarified before its application ; and to facilitate the operation, the part should be fomented (*Yogaratnākara*).³ After suction, the horn is to be covered by a piece of cloth or a small bladder of animals.

Vāllūki⁴ describes the śringa thus :—"It is the horn of a white cow, half-moon shaped and seven anguli broad. The orifice

¹ वाह्नुलासंगं भवेच्छृङ्गं चूपणेऽदशाह्नुलं ।

अगेसिद्धार्थकच्छिद्रं सुनभचुचुकाक्षति ॥

Aṣṭāṅga Hṛdaya Saṁhita, I. xxv.

² तदप्रच्छिते ततुवस्त्रपटलावनज्ञेन शङ्खेन शोणितमवसिचयेदाचूषणात् ।

Suśruta Saṁhitā, I. xiii.

³ स्वे दे विदध्याल्कुशलश्च नाड्या शङ्खेन रक्तं वहुशः हरिच्च ।

Yogaratnākara Arbuda cikitsā.

⁴ विषाणः श्वेतगोरिन्दूचक्रं सप्ताह्नुलायतम् ।

चिप्पान्तः पित्रुपेशिकं योज्य वातयुतेऽस्तुजि ।

आङ्गूष्ठे मूलवन्मूले छिद्रमयेऽस्य सुद्धवत् ।

Vāllūki quoted in Nibandha Saṁgraha, I. xiii.

at the base is equal in circumference to that of the base of the thumb, while the end which is perforated admits a moong. This orifice at the end is closed by a wick of cotton''. Cakra-pānidatta says that the horn should be three aṅguli long, and its orifice should be of the size of the stalk of an oleander flower.

Suśrnta mentions a peculiar use of the horn¹: the extraction of an insect, cerumen, etc. from the middle ear by means of a horn or a probe. The horn was evidently used as an apparatus for suction, and Suśruta describes suction as one of the methods of extracting śalya from the body². Caraka³ uses horns and leeches to extract venom from a snake-bite; and Suśruta also refers to it. Besides the horns and cupping glasses, suction used to be accomplished by the surgeon's mouth.

Similarly Paul⁴ says that foreign bodies may be sucked out from the ears with a reed.

On the method of suction as a mode of treatment, Erichsen⁵ says:— “In former days, when duels with the small swords were of frequent occurrence, persons called “suckers” who were often the drummers of a regiment, were employed to attend the wounded combatants. This treatment which was conducted with a certain degree of mystery, consisted in sucking the wound till all blood ceased to flow, and then applying a pellet of chewed

¹ कर्णच्छद्रे वर्तमानं कीडं क्लेदभलादि वा।

गङ्गाप्रवर्षीमानथवापि शलाकया।

Suśruta Samhitā, VI. xxi.

² See foot-note 3. P. 108.

³ दंशं वा चुबेन्मुखिन् यवचूर्णं पांशुपूर्णेन।

प्रच्छन् बेधजलौकः गङ्गैः स्वाव्यं ततो रक्तम्॥

Caraka Samhitā, VI. xxv.

⁴ Paul. VI. xxiv. and III. xxiii.

⁵ Erichsen's Surgery, Vol. I. p. 341.

paper or a piece of wet linen to the orifice; in this way it would appear that many sword thrusts traversing the limbs were healed in a few days. The process of suction cleared the wound thoroughly of all blood, and drawing the sides into close apposition, placed the parts in the most favourable condition possible for union by primary adhesion. This practice might, perhaps, in many cases advantageously imitated in the present day by means of a cupping glass and syringe".

We also find Suśruta¹ describing a vasti yantra in the treatment of snake-bite. The tube is open at both ends, one end is applied to the part bitten by the snake, while to the other end the surgeon puts his mouth to suck out the poison. So this vasti yantra may be compared to the modern aspiration syringe.

Cupping instruments of metal or horn are still used by the Arabs in Kordofan and Sir R. Pasha² suggests that cupping is possibly borrowed by the west from the "most perfect physicians" the Arab. But now we are confident that the credit is due to the Hindus.

ALĀBU YANTRA.

Alābu or gourd is described to be made of the bark of the succulent fruit called alābu (*Lagenaria Vulgaris*). The pulp is scraped away and the bark is allowed to dry. Such a bark should be selected which is twelve and eighteen aṅguli in length and circumference respectively. Its mouth should be circular and should have a diameter of three or four aṅguli. A fire is to be lit inside it by burning a strip of dry cloth to produce a vacuum, and the

¹ प्रतिपूर्व्यं सुखं वस्तेहितमाचृषणं भवेत् ।

Suśruta Samhitā, V. v.

² Vide Third Report, Wellcome Research Laboratory at Gordon. P. 316.

instrument to be applied instantly to the intended part of the patient's body. It should be thus used to drain blood and phlegm from the body (Vāgbhaṭa¹). In modern times cupping glasses are used for like purposes in a similar manner.

Vallūki² describes the alābu yantra thus:—"The mouth of the instrument is well formed and has the diameter of four aṅguli. The body has the circumference of eight aṅguli and is well smeared with a paste of black mud. It is used for drawing out blood". In yogaratnākara³, śṛṅga and alābu are directed to be used for extraction of blood from accidental wounds. Caraka mentions the use of alābu for blood-extraction⁴.

Another instrument known as the ghaṭī yantra was used exactly in the same way⁵. It is said to consist of a brass pot

¹ सराह्नादशाङ्गुलोऽलावुर्नाहे लषा दशाङ्गुलः ।

चतुवर्षाङ्गुलं वृत्तास्रो दीपोऽनः श्वे अरक्तहृत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

² अटाङ्गुलपरीणाहा चतुरङ्गुलनालसमिता सुसुखौ कण्ठस्तदलिमा ततुः शेषा रक्तावसेचनेऽलावुरिति ।

Vallūki quoted in Nibandha Saṅgraha I. xiii.

सान्तर्दीपयाऽलाव्या ।

Suśruta Saṃhitā, I. xiii.

³ क्षिन्ने भिन्ने तथा विद्धे चते सद्यो भिषगवरः ।
पद्मसूत्रेण संस्तेदं ब्रणं ब्रणविशारदः ॥
मुहुर्मुहूर्थया दुःखं ना प्राप्नोति ब्रणी नरः ।
अथवा दीप्यलवणपोटत्वा स्वेदयणुहः ॥
सन्तप्त्या तप्तलोहपात्रसंयोगतः क्रमात् ।
दुष्टं रक्तं स्थितं चापि शङ्खलाव्यादिभिर्हरेत् ॥

Quoted in Yogaratnākara.

⁴ रुधिरागमार्थमथवा शङ्खलावुभिराहरेत् रक्तम्—

Caraka Saṃhitā, VI. vii.

⁵ तद्वदघटैहिवा गुल्म विलयोन्नमने च सा ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

which is still used commonly in India by all classes of people for drinking purposes. A fire should be lit inside as before and the ghaṭī applied to the surface of the body covered by a piece of cloth. It soon becomes firmly fixed and is thus used to raise abdominal tumours by means of it for purposes of correct diagnosis and also to effect its cure by subsidence. It is still used by the common people for the same ends.

Caraka¹ says :—“After the abdominal tumour has been relaxed or softened a little by fomentation and oleaginous application, it is to be covered by a piece of cloth. Then inside a small ghaṭī, a fire is to be lit by burning kuṣā and other forms of grasses ; the pot is then to be inverted and pressed over the part covered by the cloth. By this way, the tumour would be drawn upwards i.e. be made prominent. The ghaṭī is then to be taken away and after removing the cloth, and examining the extent of the tumour, it is to be incised. The different shapes of the incisions are called vimārga, ajapada and ādarśa. After incision, the tumour is to be pressed and rubbed with fingers. But the intestines and the heart must not be touched.”

The extraction of blood by means of cups, has been practised from remote antiquity. It is interesting to note that both the Latin and Greek terms—*cucurbitula* and *συκνα* signify a gourd;

¹ स्त्रिरधस्तिनश्चरौराय गुच्छे शैथिल्यमागते ॥

परिवेष्य प्रदीपांसु वल्जानयवा कुशान् ।

भिषक् कुच्छे समावाय गुच्छं घटसुखं त्रिपेत् ॥

स गृह्णीतो यदा गुच्छस्तदा घटमयोऽवरेत् ।

वस्त्रान्तरं ततः लाला भिन्द्यादगुच्छप्रभाणवित् ॥

and we know that Alābu also means a gourd. It is curious that the instrument should have been known to the ancient Hindus and Greeks by the same name.

Prosper Alpinus¹ (16th century) who wrote a book on the state of medicine in Egypt in his time, gives drawings of cupping horns he saw there. The horns were those of young bulls, highly polished, with a small hole at the top, by which the air was extracted by suction. To close the orifice a small tab of parchment was taken into the mouth and affixed by the tongue. The Egyptians also used cupping glasses, by suction and not by fire, a method evidently unknown to them.

Hero of Alexandria (B. C. 285—222) describes an interesting form of cup. Milne summarises his account thus:²—"The figure shows a cup of ordinary flattened form, divided into two by a diaphragm. Two tubes pass through the fundus, one passing through the diaphragm, the other not. Each of the tube is fitted with another which is open at its inner end but closed at its outer end and provided with a small cross bar to rotate it. Each of these sets of tubes is perforated by small openings. In the case of the short tubes, these are outside the cup, in the case of the long tube they are inside the cup, in the chamber shut off by the diaphragm. By rotating the piston these openings can be placed in apposition or not at will, thus forming valves. Open valve A by placing the hole in apposition. Close valve B by turning the holes away from each other. The inner chamber of the cup is now shut off except for the small hole A. Apply the mouth to the valve A, and suck the air out of the chamber. Close valve A. Apply the cup to the affected part. The advantage

¹ De Med. Aegyptiorum. Ed. 1541 lib. ii. ch. xii. p. 189.

² Græco-Roman Surgical Instruments. P. 104.

of this arrangement is that the affected part is not directly sucked upon by the mouth ; and the instrument is therefore more pleasant for the operator to use”.

Celsus¹ thus describes the different kinds of cups :—“There are two kinds of cups, bronze and horn. The bronze is open at one end and closed at the other ; the horn, open at one end, as in the previous case, has at the other end, a small foramen. Into the bronze kind, burning lint is placed, and then the mouth is fitted on and pressed until it sticks. The horn is placed empty on the body, and then by that part where the small foramen is, the air is exhausted by the mouth, and the cavity is closed off above with wax and it adheres in the same way as before. Either may advantageously be constructed, not only of these varieties of materials but of another substance. If other things are not to be had, a small cup or a narrow mouthed jar will answer the purpose. When it has fastened on, if the skin has previously been cut with a scalpel, it extracts blood ; but if it be entire, air”.

Paul² remarks that “those which are made with longer necks and broader bellies are possessed of a strong power of attraction.” Both Oribasius³ and Aretaeus⁴ allude to them. Antyllus says that there are three materials of which cups are made—glass, horns, and bronze. A good number of such cups occur in the Naples, British and Scottish National Museums.

¹ Celsus. II. xi.

² Paulus Aegineta. VI. xii.

³ Med. Coll. VII. xvi.

⁴ De Morb. Acut. I. 10.

Albucasis¹ gives a full account of dry cupping. In applying the instrument he advises us either to create a flame in it, or to fill it with hot water. He gives drawings of various instruments of cupping. Rhases speaks of applying a glass or a cupping instrument to draw off blood after leeching. The other Arabians give little additional information.

In modern times, cupping glasses are used in the same way as before.

V. Śalākā or Rods.

The rods, or pricker-like instruments, or probes are described to be of various kinds and are recommended to be used for various purposes²; so their length and circumference would vary according to some special uses required of them. Suśruta³ says : "There are two kinds of śalākā with their ends shaped like the head of the earthworm. They are used for probing abscesses and sinuses.

Two śalākā have their ends shaped like the wing of an arrow. These are to be used for raising any part for the purpose,

¹ Albucasis, Chirrug. ii. 98.

² नाडीत्रणान् श्ल्यगर्भानुमार्गुतसङ्गिनः शनैः ।

करीरवालाङ्गुलिभिरेषणा वैषयेन्निपक् ।

Suśruta Samihitā, IV. i.

³ श्लाकाश्लाक्षपि नाना प्रकाराणि नाना प्रयोजनानि यथायोगपरिणाहद्वीर्धाणि च तेषां गण्डश्लाकपुङ्गसंपदण्ण वडीश्मुखे इ इ एषण व्युहनचालनाहरणार्थसुपदिश्ये ते । मसूरदल-मावमुखे इ किञ्चिदानतये स्थोतोगतश्ल्योद्भरणार्थं । षट्कापांसक्तोष्णीषाणि प्रमार्जनं क्रियासु । त्रीणि दर्व्याक्तीनि खल्मुखानि चारोषधप्रणिधानार्थं । त्रीण्यन्यानि जाम्बवदनानि त्रीष्खङ्गुश्वदनानि षड्वायिकर्मस्तभिप्रतानि । नासार्वदहरणार्थमेकं कोलास्थिदलमाच्छुखं खङ्गतीच्छोषं । अञ्जनार्थमेकं कलाधपरिमण्डलमुभयतो सुकुलाय । मूलमार्गविशेषधनार्थ-मेकं मालतीपुष्पहन्ताच्यग्रमाणपरिमण्डलभिति ।

Suśruta Samihitā, I. vii.

after incision, of extracting any foreign body from it. Others assign to them the function of bringing together the lips of the wound caused by an abscess being opened and emptied.

Two śalākā have their ends shaped like the hood of a snake. They are useful for transferring any material from one part to another. Some of the simple probes used by the ancient Greek and Roman surgeons carried a single or double snake of Æsculapius at one end. But evidently it was meant as an ornamentation and served no useful purpose.

Two śalākā have their ends shaped like a fish-hook but are blunt. They are used for extracting any extraneous material from the muscles or bones”.

The last six kinds of Suśruta are practically the same as the six śaṅku of Vāgbhaṭa,¹ which are the following :—

The śaṅku are six in number. Amongst these, two are twelve and sixteen aṅguli long respectively. They are used for the purpose of raising a foreign body upwards from the wound.

Two varieties have their ends shaped like the hood of a snake. They are ten and twelve aṅguli long ; and they are used for the purpose of moving a foreign body in the wound in all directions.

Two varieties have the shape of a fish-hook—the ends resembling the stem of an arrow. These are used for the extraction of foreign bodies from the wound.

¹ शङ्कवः षडभौ तेषां षोडशवादशङ्कुलौ ।

व्युहने, हि फणावक्रो हौ द्वादश दशङ्कुलौ ॥

चालने शरपुङ्गा सरा वाहार्ये बडिशाकृतिः ॥२५

Suśruta¹ mentions another pair of śalākā which have their ends shaped like a masūra pulse, and slightly curved; these are used for the purpose of extracting a foreign body from the external outlets of the body such as mouth, nose, etc. They are eight and nine aṅguli long respectively.

SWAB PROBES.

Six śalākā are used for the purpose of wiping out the principal excretory canals of the body viz., rectum, nose and ears.² Their ends are covered with cotton like a head-dress (pāgdī). The two śalākā intended for the rectum, have the lengths of ten and twelve aṅguli respectively for short and long distances. So the two varieties of probes for the ears are eight and nine aṅguli long, while the other two kinds of probes for the nose are six and seven aṅguli long respectively. Some commentators are of opinion that these six śalākā are meant for clearing abscesses.

For similar purposes the Greek and Roman surgeons used the spathomele or spatula probe. Priscianus³ writes: "First of all we must frequently wipe away the clots of blood from the nose

¹ See foot note 2, P. 155.

उभेगण्डपदसुखे खोतभ्यः श्ल्यहारिणी ।

मस्रदलवक्त्रे द्वे सग्राता मष्टनवाङ्गुले ॥२४

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

² कार्पास विहितोष्णीषाः श्लाकाः षट्प्रमार्जने ।

पायावासान्न दूरार्थे द्वे दश हादशाङ्गुले ।

द्वे षट् सप्ताङ्गुले ब्राये द्वे कर्णेऽष्टनवाङ्गुले ॥२८॥

Ibid.

³ Priscianus. xiv.

with the end of a spathomele wrapped on the 'berry' with soft wool, and then occlude it by plugging with wool in the same way."

The use of probes, having the ends wrapped with wool, for wiping out discharge of pus from the ears of horse, is mentioned by Jayadatta Suri¹ in his Treatment of Horses.

SPOON-SHAPED^{*} PROBES.

Three probes are described to have their ends shaped like a khala or mortar with a conical cavity, and so they resemble a spoon. They are to be used for the purpose of applying caustic solutions, etc.²

Similarly cyathiscomele, which is a variety of spathomelc in which the spatula is replaced by a spoon, is said to have been used by the Greek surgeons to mix, measure and apply medicaments. The specimens of these instruments occur in the Naples Museum. Sometimes the edge of the spoon is sharp and is recommended to be used as a curette. Scrivonius Largus directs us to use the spoon of an ear specillum for the application of caustics to haemorrhoids.

¹ पूयस्वावेष जानीयात् शोथमध्यन्तरोङ्गम् ।

पिचुना वेष्यिला तु श्लाकाग्ं समाहितः ॥

तेन कर्णान्तरे पूर्थं कर्षयिला विचक्षणः ।

पातितस्य सुवद्धस्य पूर्वेन्द्रधूसर्पिषा ॥

Aśvavaidyaka, Ch. 34, v. 2. and 3.

² See foot-note 2, P. 155.

NAIL-SHAPED PROBES.

Vāgbhāṭa¹ describes three other probes for the same purpose. They are eight aṅguli long; their ends are bent and resemble in size and shape the nails of the third, fourth, and fifth fingers respectively.

Paul² mentions a nail-shaped probe in the treatment of bubonecele. But this was applied as a cautery and not for the application of medicaments. Nail-shaped cauteries are also referred to by Hippocrates³ in the treatment of recurrent dislocation of the shoulder-joint.

JĀMVOVAUṢTHA PROBES.

Three probes are called Jāmvovouṣtha for their ends are shaped like the fruit of Jambul tree (*Eugenia jambolanum*).⁴ Three other śalākā have their ends shaped like aṅkuṣa or elephant driver's goad.⁵ They may be made of any length required

¹ अष्टाङ्गुला निम्नसुखा स्त्रियः क्षारौषधं प्राप्ते ।
कनीनी-मध्यमाऽनामी-नखमान-समैर्मुखैः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² Paulus Aegineta, VI. lxv.

³ Hippocrates iii. 15.

⁴ See foot-note 2, P. 155.

श्लाका जाम्बवौष्ठानं क्षारेऽग्नौ च पृथक् वयं ।
युज्यात् स्थूलानु द्रीघोर्णां,

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

⁵ See foot-note 2, P. 155.

• For the diagram of the aṅkuṣa see Fergusson's Tree and Serpent Worship; Plate xxxiii. Sanchi. xxxvii. fig. I. and xxxviii, fig. 1 & 2.

by the surgeon. These six varieties are recommended for the purpose of applying caustic medicaments and the actual cautery.

Paul¹ mentions a gamma-shaped cautery in the radical cure of hernia. This cautery is shaped like the Greek letter Γ; so it resembles the *aṅkuśa* cautery of the Hindus. The *aṅkuśa* is similar in appearance to the Greek letter.

One variety, which is used for the purpose of removing a tumour from the interior of the nasal cavity, has its end shaped like a khala or mortar, with sharp edges, and of the size of half the stone of the fruit of the jujube tree (*Ziziphus jujuba*)². Vāgbhaṭa³ mentions a similar probe for the purpose of applying actual cautery to a nasal tumour. Its end resembles in shape and size, a half of the stone of the fruit of the jujube tree.

This spoon-shaped probe of the Hindus is comparable to the curette like sharp *cyathiscomele* of the Greeks, noted before.

COLLYRIUM PROBES.

For the purpose of applying collyria to the eyes, a rod is mentioned having the length of eight *aṅguli* and the thickness of a pea. Its both ends are shaped like buds⁴.

The probes for applying collyria to the eyelids, should be six *aṅguli* long, with a rounded bulbous end. They may be made of gold, or silver, or copper, or iron, or stone. For the habitual use of collyria, a lead probe is prescribed. When medicines are directed

¹ Paul, VI. lxii.

² See foot-note 2, P. 155.

³ कौलास्ति दल तुत्वा स्या नासार्दी बुद्ध दाहकत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

⁴ See foot-note 2, P. 155,

to be applied not only to the lids but also to the conjunctiva, the finger is recommended as it is a softer and safer instrument. Again the probes would vary according to the nature of the collyria to be used. As for the application of lekhana collyrium, the probe should be made of copper and should be ten aṅguli long. The probe is advised to be made thinner at its middle to afford a firm grasp by the surgeon. The ends are shaped like buds. For applying ropana collyrium, a similar probe is to be used, but it should be made of steel; while for the application of a collyrium for the improvement of the visual strength, a probe made of gold or silver, and having the size and shape of a finger is recommended by Cakradatta.¹

Suśruta² likes a probe of steel, or bell-metal, or copper for lekhana collyrium; and of gold, or silver, or horn, for ropana and snehana collyria. The probe should be eight aṅguli long, and the eye is to be kept open and fixed by the left hand, while the right hand is to hold the probe, and so the collyrium is to be applied to the eye.

¹ दशाङ्गुला तनुर्मध्ये शलाका सुकुलानना ॥

प्रशस्ता लिखने तास्मी रोपणे काललोहजा ।

अङ्गुलीव सूवर्णीत्या रूप्यजा च प्रसादने ॥

Cakradatta. Āśhyotana Cikitsā.

² तेषां तु लघुगुणान्वये विद्ध्याद् भाजनान्वये ।

सौवर्णं राजतं शाङ्गनाभं वैदूर्यकांस्तजं ॥

आयसानि च योज्यानि शलाकाश्च यथाक्रमं ।

वक्रयोर्मुकुलाकारा कलाय परिमण्डला ॥

अष्टाङ्गुला तनुर्मध्ये सुकृता साधुनियहा ।

औडुख्येश्वरातानि शारीरौ वा हिता भवेत् ॥

Sāringadhara¹ says: "The collyrium probe should be made of stone or metal. It should be eight aṅguli long and its ends must be made smooth and rounded like a common pea. For lekhana collyrium, a copper, or iron, or stone probe is to be used, while for ropāṇa collyrium the tip of the finger is recommended for its softness."

Of the probes used by the Hindus for applying collyrium to the eyes, fortunately we possess a few specimens. Among the objects of interest found in the excavations at Bijnor, we find, "fourthly, one copper salai or instrument for applying antimony to the eye, similar to those found in the Bihat excavations."²

¹ सुखयोः कुण्ठिता श्वस्ता श्लाकाष्टाङ्गुलोन्मिता ।

अश्मजा धातुजा वा स्यात् कलायपरिमण्डला ॥

ताम्बलोद्धाश्मसंजाता श्लाका लेखने मता ।

मुवर्णरजतोङ्गुता श्लाका लेहने मता ।

अङ्गुलौच मटुलेन कथिता रीपणे वृधैः ॥

Sāringadhara Saṅgraha. III. xiii.

Yogaratnākara. Eye Diseases. P. 823.

निफल सलिलयोगे भङ्गराजद्रवे च
हविषि च विषकल्पे चौर आजि मधूये ।
प्रतिदिनमय तसं सप्तधा सौसमेकं
प्रणिहितमय पश्चात् कारयेत् तच्छ्लाकाम् ॥
सवितुरुदयकाले साङ्गना व्यञ्जना वा
करकरिकसमेतानर्मपैचित्यरोगान् ।
असितसित समुद्धान सन्धिवर्त्माभिजातान्
हरति नयनरोगान् सेव्यमाना श्लाका ।

Cakradatta, Netraroga Cikitsā.

² "Vide Princep's (Thomas') Indian Antiquities, fig. 18. pl. iv" J.A.S.B. IX. 1. 7.

Specillum with two olivary ends formed a variety of probe of the Greek and Roman surgeons. It was used as an ordinary probe in dealing with crooked fistulæ, and as a cautery to destroy the roots of hairs after epilation. Sometimes it carried an eye in one of its olives and was used in the treatment of nasal polypus. The eye was threaded with a cord having many knots along it. The other end of the probe was pushed through the nose and withdrawn by the mouth, and then by a sawing movement of the cord with both hands of the surgeon, the polypus was removed.¹ A single probe for the application of semi-solid medicaments, occurs in the outfit of the oculist of Rheims, in the museum at St. Germain-en-Laye and is figured by Milne.²

KARNA-ŚODHANA OR EAR-CLEANER.

This śalākā is said to have its end shaped like the end of a leaf of Aśvattha (*Ficus religiosa*). The instrument looked like a sruva—one of the famous spoons used in sacrificial ceremony.³ It was used for the purpose of extracting wax from the ears.

The different kinds of spoons used in the ancient Hindu ceremonies were as follows : "Three different sruk or offering-spoons are used *viz.*, the guhu, upabhrit and drubha. They are made each of a different kind of wood, of an arm's length (or according to others, a cubit long) with a bowl of the shape and size of the hand, and a hole cut through the bark and front

¹ Paul VI. lxxxvii, VI. xiv, VI. xxv.

² Graeco-Roman Surgical Instruments, pl. xi. fig. 5.

³ कर्णशोधनं मन्त्रत्वं पदं प्रान्तं सुवानन् ॥

side of the bowl and fitted with a spout, some eight or nine inches long and shaped like a goose's bill. The sruva or dipping-spoon, on the other hand, chiefly used for ladling the clarified butter (or milk) from the butter vessel into the offering-spoons, is of the khadira wood (*Accacia catechu*), a cubit long, with a round bowl measuring a thumb's joint across and without a spout".¹

So we see that the bowl of the *karna-śodhana* was round in shape.

Suśruta also mentions a śalākā for the extraction of cerumen or minute insects from the ears.² Cakrapāṇi³ alludes to it. In modern times, the ear-cleaner, as used commonly in India, is a tāla yantra. Ear specillum is frequently mentioned by the Greeks and Romans. It consisted of a small narrow scoop at one end and a simple probe at the other. The use of the scoop is thus described by Archigenes⁴: "If a bean, stone, etc. fall into the ear, remove it with the small narrow scoop of the ear specillum". Celsus⁵ directs us to extract a scab or cerumen by means of the ear specillum.

The ear scoop used by the modern surgeons is a narrow scoop, more like the Hindu pujā vessel known as kuśi. The ear scoop is often made in combination with a director.

¹ *Satapatha Brāhmaṇa*, Sacred Books of the East, 1. 3. 1. 1. foot-note.

² See foot note 1, P. 149

³ क्षेदधित्वा तु तैलेन स्फेदेन प्रविलाय च ।

शोधयेत् कर्णगूदस्तु भिषक् सम्यक् शलाकया ॥

Cakradatta, *Karṇaroga*.

⁴ Galen. XII, 652.

⁵ Celsus. VI. viii.

GARBHA-ŚĀNKU. FÆTUS OR TRACTION HOOK.

The end of this instrument is said to have been bent like aṅkuśa or elephant driver's goad. It is described to have the same length as the other śāṅku have *i. e.* ten to sixteen aṅguli, and it is eight aṅguli in width.¹ It is recommended for extracting a dead fœtus from the mother's womb, after perforating its head by the maṇḍalāgra or mudrikā knife. Suśruta recommends us to perforate the head and then to extract the bones by the śāṅku or hook, and lastly to apply traction by fixing it about the chest or axilla. If the head can not be perforated, it is to be applied to the eyes or cheeks.²

Tractiou hook for extraction of a dead fœtus was well known to the ancients. Hippocrates³ bids us break up the head of the fœtus with a cephalotribe and remove the bones with bone forceps, or deliver it by a traction hook inserted near the clavicle. Celsus⁴ advises us to insert a smooth hook with a short point and to fix it in the eye, or the ear, or the mouth, or the forehead, and so the fœtus is to be dragged down. Soranus points out the best places for the insertion of the hook to be the eyes, the occiput, the mouth, the clavicles, and the

¹ नतोऽये शङ्खुना तुल्यो गर्भं शङ्खरितिष्ठृतः ।

अष्टाङ्गुला यतसेन सूढगर्भं हरेत् स्थियाः ॥ १६ ।

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

² चत्र स्थियमाशास्य मण्डलायेणाङ्गुलीशस्तेण वा शिरोविदायर्यं शिरःकपालान्याहृत्य शङ्खुना गृहीत्वा रसि कचार्यां वापहरेदभिन्ने शिरसि चाक्षिकृटे गन्ते वा ।

Suśruta Saṁhitā. IV. xv.

³ Hippocrates. II. 70.

⁴ Celsus. VII. xxix.

ribs in head presentations; and the pubes, ribs, and clavicles in footling cases.¹ Soranus, Aetius² and Paul³ direct us to extract the foetus in the same way but they recommend us to use two hooks instead of one, in order that the pulling may be straight down and not to one side.

Albucasis,⁴ Rhases,⁵ Haly Abbas,⁶ and Avicenna⁷ give similar directions for opening the child's head and for delivering the foetus with hooks.

This purpose in modern times is served by the blunt hook and crotchet.

YUJÑA-ŚAÑKU OF MIDWIFERY FORCEPS.

An instrument is thus named and figured by modern writers on Hindu surgery, bearing some resemblance to the modern forceps, for extracting the child alive. We have, however, no mention of any such instrument in the works of Caraka, Suśruta Vāgbhāṭa and other ancient authorities. The Greeks and, Romans were also ignorant of it; and the Arabians fared no better, though Adams, in his commentary on Paul⁸ asserts that Avicenna refers to forceps for the delivery of living chilidern. Mulder, in his valuable work,⁹ gives an extract from a translation from the works of Avicenna supporting

¹ Soranus. II. xix.

² Aetius. IV. iv. 23.

³ Paul. VI. lxxix.

* Albucasis. Chirurg. II. 76 and 77.

⁵ Rhases. Cont. xxii.

⁶ Haly Abbas. Pract. ix. 57.

⁷ Avicenna. iii. 21, i, 24.

⁸ Paulus. Æginita. III. lxxvi.

⁹ Historia Forcipum et Vecticum. p. 6.

the same conclusion. Smellie¹ says : "With regard to the fillets and forceps, they have been alleged to be late inventions ; yet we find Avicenna recommending the use of both. The forceps recommended by Avicenna is plainly intended to save the foetus". "He recommends all the old methods for assisting in natural labours ; and if the woman can not be delivered by these, he orders a fillet to be fixed over the head : if that can not be done, to extract with the *forceps* ; and should these fail, to open the skull ; by which means the contents will be evacuated, the head diminished, and the foetus easily delivered."² Playfair³ also holds the same view. The point is however by no means settled. For Milne⁴ says : "A full consideration of Avicenna's words seems to me to lead to the conclusion that he is describing no more than extraction with a craniotomy forceps. If the forceps fail, the child is to be extracted by incision, as in the case of a foetus already dead (and decomposed so that the forceps would not hold)."

Thus we may be sure that there is no availale evidence of the use of delivery forceps by the Hindus, Greeks, Romans and Arabs ; and the Chamberlens are still the undisputed claimants to the glory of the invention.

But there is no doubt that the Hindu surgeons tried extraction of the living foetus by manual traction. The hands are recommended to be well oiled and introduced into the uterus. If the child be dead, sharp intruments are advised to be intro-

¹ Smellie. Treatise on Midwifery, p. 40.

² Ibid, Edited by McClintock. New Syd, Soc, vol. I. Introduction p. 50.

³ Researches on Operative Midwifery, p. 10.

⁴ Graeco-Roman Surgical Instruments, p. 156.

duced into the vagina for cutting upon the fœtus. But on no account such instruments are to be used so long as the child is alive.¹

SARPA-FAÑĀ OR SNAKE'S HOOD.

It is also called agra-bakra *i. e.* the end bent. It is a śaṅku or hook similar to the above, the end being bent like the hood of a snake.² It is to be used for the purpose of extracting stone after operation.

Suśruta, in the operation for extraction of stone through the perineal incision, directs us to use the agra-bakra to bring the entire stoue out of the wound. But in the case of females, he recommends us to use a knife having a spoon like a scoop, to prevent the formation of a vescico-vaginal fistula.³ Is it a spoon-shaped knife, or is it a double instrument on a handle—a knife at one end and a scoop at the other? The Greeks used a knife having a scoop at the end.

¹ गर्भं जीवति मूढं तु गर्भं यद्वेन निहरेत् ।
हस्तेन सर्पिषाक्तेन योनेरल्पगतेन सा ॥
स्त्रे तु गर्भं गर्भिन्या योनौ शस्त्रं प्रवेशयेत् ।
शस्त्रशस्त्रार्थविदूषी लघुहस्ता भयोजिङ्गता ।
सचेतनं तु शस्त्रेन न कथञ्चन दारयेत् ॥

Yogaratnākara, Muḍdhagarva Cikitsā.

² अशर्मर्थाहरणं सर्पफलावद्धकं अगतः ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

³ यथा च न भिद्यते न चूर्णते वा तथा प्रयत्नते चूर्णमल्पमयवस्थितं हि पुनः परिहङ्गमेति तथात् समलामयवक्त्रेणाददीत । स्त्रीणानु वक्तिपार्श्वगती गर्भाशयः सन्निकृष्टः तथान्ना सामुत्सङ्घवच्छस्त्रं पातयेदतोऽन्यथा खल्वासां मूत्रस्थावी ब्रणो भवेत् ।

Suśruta, Saṁhitā. IV. vii.

Celsus¹ describes the extraction of stone through a perineal section by means of the lithotomy scoop. "The scoop is slender at the end and flattened out in the shape of a semi-circle, smooth externally where it comes in contact with the tissue, rough internally where it meets the calculus". It was a long hook-like instrument.

Aetius² mentions a special stone extractor, under the treatment of calculus in the female. Some understand by it the lithotomy forceps.

In modern times we use the lithotomy forceps and scoop for the same purpose.

I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows : "I will not cut persons labouring under the stone, but will have this to be done by men who are practitioners of this art". This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation. "M. Littré finds some difficulty in accounting for the circumstance that the noviciate in surgery is interdicted from the operation of lithotomy." Adams,³ commenting on the sentence, says : "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physician, Avenzoar⁴, who "pronounces the operation to be one, which no respectable physician would witness, and far less to perform."

¹ Celsus. vii. xxvii.

² Aetius. IV. iv. 94.

³ The Genuine Works of Hippocrates. Vol. II. P. 777—8.

⁴ Avenzoar. II. 2, 7.

The explanation that this was proscribed because there were men who devoted themselves exclusively to this kind of treatment, and that if the qualified surgeons be allowed to practise the operation, they would interfere in the sphere of action of the lay lithotomists, cannot be considered satisfactory. For the question still remains the open one, why should Hippocrates proscribe this operation from the domains of scientific surgery, simply because a few laymen happened to practise it.

The real explanation is that in Hippocrates' time success in the operation was very difficult to achieve, consequently he interdicted the operation much in the same way as abdominal operations were considered sacred before the days of antiseptic surgery. It is curious to find that Suśruta calls this operation the worst of all surgical operations, for he says¹ : "Even experienced and able surgeons fail to attain success by operation for the stone. So the surgical treatment is the worst of all treatment here. But if you do not operate, the patient will die; and it is doubtful whether he will live after the operation; so give him the chance of operation in God's name." I do not know whether this passage of Suśruta has any causal relation to the remarks of Hippocrates, but there is no doubt that the former serves as a better commentary on the latter, than anything hitherto suggested.

Adams² says that this operation was practised by a class of men,

¹ कुशलास्यापि वैद्यस्य यतः सिद्धिरिहाप्नु वा ।

उपक्रमो जघन्योऽथमतः स परिकौर्चितः ॥

अक्रियायां भ्रुवो स्त्युः क्रियायां संशयो भवेत् ।

तस्मादापृच्छा कर्त्तव्यमीश्वरं साधूकारिणा ॥

Suśruta Samhitā. IV. vii.

² Commentary on Paulus Aegineta. Vol. II. P. 363.

separate from the surgeons, in all countries in ancient times, and points out that the ancient operation of lithotomy is still practised with great success by the native doctors of Hindusthan. No conclusion is, however, to be drawn from the modern practices in India, as we find separate classes of men not only for stone, but also for bone-setting, cataract, etc.: And whatever may be the practice in modern times, we find that during Suśruta's time, the operation was not the privilege of the laymen.

ŚARAPUṄKHA-MUKHA PROBE.

This instrument is also described to have its end bent like the hood of a snake. It is four aṅguli long and is recommended to be used for the purpose of extracting a tooth from its socket.¹

Tooth elevator or instrument for levering teeth is mentioned by Galen.² It is of the same size as the bone lever which, according to Paul,³ is seven or eight aṅguli long.

This instrument resembles in shape and action the tooth elevator of the modern surgeons.

ARDHACANDRA-MUKHA ŚALĀ. HALF-MOON PROBE.

The first half of this variety of śalā is curved like a half-moon, to which is attached the second half as a rounded handle.⁴ Suśruta advises us to use it for the purpose of applying actual

¹ शरपुङ्क्षुखं दत्तपातनं चतुरङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

² Galen. xviii. 593.

³ Paulus Aegineta. VI. evi.

⁴ शलाकामनवर्त्मनि ।

मध्योङ्गे वृत्तदण्डात्र मूले चाङ्गन्तुसन्निभां ॥

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

cautery to the groin in bubonecele, to prevent the hernia from entering into the scrotum.¹

A crescent-shaped cautery was also used by the Greek and Roman surgeons. So Paul² says that in cases of sloughing of the prepuce we must cut it off and use lunate cauteries to stop haemorrhage and prevent the spreading of the wound. Again he mentions a cautery shaped like the Greek letter Γ, in the radical cure of hernia.³

BONE LEVER.

Instruments for levering fractured bones into their proper positions are mentioned several times by Suśrata. In the treatment of fracture of the nasal bones, a śalākā is recommended to be used as a bone lever for raising and depressing the fractured ends.⁴ Sometime a muṣala or pestle is advised to be used.⁵ It is a thick wooden pestle the end of which is plaited with iron. It is still used to strike upon paddy to separate the husk from the rice. Suśruta mentions its use to reduce dislocations of the joints of the shoulder and neck.⁶

¹ तव या वङ्गस्था ताः दहेद्वन्द्वक्रया ।

सम्यग्मार्गावरोधार्थं कौशप्राप्तं तु वर्जयेत् ॥

Suśruta Samhitā, IV. xix.

² Paulus Aegineta. VI. lvii.

³ Ibid. VI. lxii.

⁴ नासां सन्नां विडत्तां वा चट्टीं कल्पा शलाकया ।

Suśruta Samhitā, IV. iii.

⁵ सन्नसुन्नमर्यत् स्तिन्नमन्तकम् मूषलेण तु ।

तथोन्नतं पौडियेच वङ्गीयाङ्गाढमेव च ॥

Ibid.

⁶ तैलपूण कटाहे वा द्रोखां वा शाययेन्नरं ॥

मूषलेनोत्तिषेत् कचामांससन्कौ विसंहते ।

स्थानास्थितच वङ्गीत स्तिकेन विचक्षणः ॥

Ibid.

The pestle was also used by Hippocrates¹ to reduce dislocation of the shoulder joint. He says : “Those who accomplish the reduction forcibly bending it round a pestle, operate in a manner which is natural. But the pestle should be wrapped in a soft shawl (for thus it will be less slippery), and it should be forced between the ribs and the head of the humerus. And if the pestle be short, the patient should be seated upon something, so that his arm can with difficulty pass above the pestle. But for the most part the pestle should be longer, so that the patient when standing may be almost suspended upon the piece of wood. And then the arm and forearm should be stretched along the pestle, whilst some person secures the opposite side of the body by throwing his arms round the neck, near the clavicle”

The bone lever used by the Greeks is thus described by Paul :² “It is an instrument of steel about seven or eight fingers’ breadth in length, of moderate thickness that it may not bend during the operation, with its extremity sharp, broad and somewhat curved.”

DIRECTOR.

Suśruta³ mentions the use of esanī or metallic probes not only to ascertain the course of the fistulous track but also to raise the bridge of skin covering the sinuses, so that the surgeon may operate on it as a guide. Cakradatta⁴ also uses a probe to

¹ The Genuine Works of Hippocrates. Adams' Trans. p. 372.

² Paulus Aegineta, Vi. cxi.

³ पक्षे चोपस्थिरधमवगाहस्त्रिन् श्यायां सन्निवेशार्द्धसमिव यत्तथिला भगद्वं समीक्षा पराचौनमवाचीनं वा वहिर्भुखमन्तर्भुखं वा ततः प्रशिधावैषणैसुन्नम्य साशयसुखरेच्छस्वेण Suśruta Saṃhitā, IV. viii.

⁴ नाडीनां गनिमन्तिष्ठ श्वलेनापाद्य कर्मवित्।

Cakradatta, Nādiṣvara Cikitsā.

learn the direction of the wound before operation. It is also mentioned in the Yogaratnākara.¹

In the treatment of fistulæ, Celsus² also says: "A director being inserted into them down to their termination, the skin ought to be incised." It is not mentioned that the eṣanī or probe was grooved, but there is no doubt of its use like a grooved director, so common nowadays. The discovery of such a director, along with several other surgical instruments, which are preserved in the Musée de Cinquantenaire, Brussels, proves that it was known to the Romans.

URETHRAL PROBE.

A variety of śalākā is described by Suśruta³ to have its end rounded like the stalk of a mālatī flower (*Echites caryophyllata*, Rox.) It is to be used for cleaning the urethral canal.

Caraka⁴ mentions a probe for examining the direction of the urethral canal and its pathological condition, before introducing the tube of the urethral or bladder clysters into it.

¹ नाइनां गतिमन्दीत्य शस्त्रे शोत्पात्य कर्मवित् ।

Yogaratnākara, p. 346.

² Celsus, VII. iv.

Græco-Roman Surgical Instruments, p. 73.

³ सूत्रमार्गविशेषधनार्थं एकं मालनीपुष्पहन्तायप्रभाण्य परिमङ्गलमिति ।

Suśruta Saṁhitā, I. vii.

⁴ ऋजोः सुखोपविष्टस्य हटे भेद्वे दृतान्विते ।

शलाकयान्विष्य गतिं यद्यप्रतिहता ब्रजेत् ॥

ततः शेफःप्रभाणेन पुष्पनेत्रं प्रवेशयेत् ॥

Caraka Saṁhitā, VIII. ix.

Class VI. The Upayantra or Accessory Instruments.

The sixth class of the blunt instruments comprises the upayantra or accessory instruments. By surgical instruments, the Hindus consider not only the instruments proper, but also any mechanical aid by which the object of the surgical treatment is attained. Thus even medicinal agents are considered under this head for they help the inflammatory swellings to subside, or suppurate, or burst open as by various external applications. The accessory instruments are :

1. RAJU OR THREAD.

As an example of thread being used as an instrument of surgery, we know that the thread smeared with caustics are recommended by Suśruta¹—kṣāra sūtra or caustic thread—for the operation of fistula-in-ano. For further informations on the subject see “Eṣāṇī or sharp probes” under the Śastra.

Thread as a material of phalavarti or tent is mentioned by Śāringadhara.² If after a vaginal or intra-uterine douche, the injection does not flow out, he advises us to introduce a strong tent made of thread, dipped in oleaginous medicines of the

¹ क्षश्टुर्वलभीरुणां नाडीमर्मशिताच या ।

चारसूत्रेण क्षिद्याद्रतु अस्त्रेण दुष्प्रिमान् ॥

Suśruta Saṃhitā, IV, xvii.

Cakradatta, Nādīvraṇa Cikitsā.

² फलवर्ति निदध्यात्वा योनिमार्गे दृढ़ं भिषक् ।

सूतैर्विनर्मितां सिञ्चां शोधनद्रव्यसंयुताम् ॥

Śāringadhara Saṃgraha, III. vii

śodhana (Purifier) group. Cakradatta¹ uses caustic threads in the treatment of piles by ligature.

2. VENIKĀ OR TWINE.

The use of twine as a ligature to be applied above the part bitten by a snake to arrest the circulation of blood towards the heart is mentioned by Suśruta.² Caraka³ also advises us to tie ligatures above and below the bitten part, then to squeeze out the poison towards the wound, whence it is to be drawn out through incisions made by a knife.

3. PATTĀ OR BANDAGES.

For the proper application of bandages, Suśruta mentions the following materials to be necessary :⁴ viz., cloth manufactured

¹ भावितं रज्जनीचूर्णः स्तु हीक्षीरे पुनःपुनः।

वस्त्रात् सुदृढं सूवं मिनत्पर्णं भग्नदर्दं॥

Cakradatta, Arśaroga Cikitsā.

² सा तु रज्जादिभिर्वज्ञा विषप्रतिकरीमता।

Suśruta Samhitā, V. v.

³ दंशात् तु विषं दष्टस्य विस्तं वेणिकां भिषक् वज्ञा।

निष्ठोऽयैदभृशं दंशसुज्ञरेन्मर्मं वर्ज्जम्॥

Caraka Samhitā, VI. xxv.

⁴ अत ऊर्ध्वं व्रणवस्त्रं द्रश्याख्युपदेक्षामः। तद्यथा चौमकार्पासविकदुक्तल कौशेय पत्रीर्ण चौनपट्टचर्मान्तर्वल्कलालावृश्वकललता विद्वरज्जुतूलफलसन्तनिका लौहानीति तेषां व्याधि कालं चावेक्षोपयोगः प्रकरणतश्च शामादेशः। तत्र कोशदामस्वस्तिकानुवेज्जितप्रतोली-मण्डलस्थगिकायमक्खटूचौनविवन्धवितानगोफणा; पञ्चाङ्गी चेति चतुर्द्वयवस्थविशेषाः।

तेषां नामभिरवाक्षतयः प्रायेणव्याख्याताः। तत्रकोशमङ्गुष्ठाङ्गुलिपञ्चसु विद्यात्। दाम सम्बाधेऽङ्गे। सभिक्षुर्बंक्षुसनान्तरतलकर्णेषु स्वस्तिकं। अनुवेज्जितन्तु शाखासु, शैवामेद्वयोः प्रतोलौ। हत्तेऽङ्गे मण्डलं। अङ्गुष्ठाङ्गुलिमेद्वयेषु स्थगिकां। यमलव्रशयोर्यमकं। हनुशङ्खगणेषु खट्टां। अपाङ्गयोश्चीनं। पृष्ठदरीरःसु विवर्णं। मूर्डिणि वितानं चित्तुकनासौधां सवस्तिषु गोफणां। जत्रुणजडं पञ्चाङ्गीमिति। यो वा यमिन् शरीर प्रदेशे मुविविष्टो भवति तं तमिन् विद्यात्।

Suśruta Samhitā, I. xviii.

from the fibres of plants, flax, cotton, wool, blankets, silk, leather, Chinese cloth, inner barks of trees, bark of bottle gourd (*Cucurbita lagenaria*), tendrils of twining plants, cane or pieces of split bamboo, rope, fruits as those of *Bombax Malabaricum*, blades of knives, and plates of metals as gold, or lead, or iron. These articles should be used with due consideration as regards the nature of the disease, the time of their use and the purpose in hand. He describes fourteen varieties of bandages as follows :—

1. *Kośa* :— a hollow cylinder or sheath to be applied to the joints of the thumb and fingers. This form of bandage is to be applied over the stumps after amputation of the limbs.
2. *Dāma* (*i.e.* tail of a quadruped?) :— it is a large bandage to be tied round a part for the relief of pain or cramps.
3. *Svastica* or a circular cross-bandage :— it is to be applied round the joints, the space between the tendons of the great and second toes, the intermammary region, the glabella (space between the eyebrows), the plantar surfaces of the feet, the palmer surfaces of the hands, and the ears. It is also the form of bandage recommended in dislocations of the shoulder joint.
4. *Anuvellita* or an encircling bandage :— it is to be applied to the limbs. This form of bandage is recommended to be applied to the limbs in cases of oblique, deep, and large cuts inflicted by a knife. A leather bandage applied in the form of *gophaṇā* would also serve the purpose. The encircling bandage is also advised in cases of fracture of the ribs.
5. *Protoli* :— a broad bandage for the neck and penis.
6. *Mandala* or a circular bandage :— it is to be applied to

the round parts of the body such as the arms, sides, abdomen, thighs, and back.

7. Sthagikā or a supporter :— a bandage enclosing a splint and pastes of medicaments to keep the parts firm. It is to be applied over the ends of the thumb, fingers, and penis. Suśruta directs us to use this bandage round the scrotum after tapping the hydrocele.

8. Yamaka or a double-bandage :— a pair of circular bandages applied to a couple of ulcers on a part.

9. Khatvā or a four-tailed bandage :— it is recommended for the temples, cheeks and lower jaw.

10. Chīna or a banner bandage :— a bandage for the inner angles of the eyes.

11. Vivandhana or a circular chest-bandage :— it is the bandage for the back, abdomen and chest.

12. Vitāna or a canopy bandage :— a large bandage for the head.

13. Gophaṇā¹ (*lit.* a sling for throwing stones) :— a concave bandage for the chin, nose, lips, shoulders and pelvis.

¹ शाखासु प्रतितां स्तिर्यक् प्रहारान्विहतान् भशं ।

सीच्येत् सम्यग्निवेशाग्नु सम्यस्थीनुपूर्वशः ॥

वज्ञा वेल्लितकेनाग्नु ततस्तेलेन सेचयेत् ।

चर्मना गोफणावन्धः कार्यो यो वा हितो भवेत् ॥

Suśruta Saṃhitā, IV. ii.

पादौ निरस्तसुभस्य जलेन प्रोक्ष्य चाचिणी ।

प्रवेश्य तु न्रसेवन्या सुखौ सौवित्ततः परं ॥

कार्यो गोफणिकावन्धः कव्यामावेश्य यन्वकं ॥

14. Pañcāngī or a five-tailed bandage¹ :— it is intended for the parts above the clavicle, as in the dislocations of the lower jaw. Caraka² mentions a bandage called kavalikā, to be tied tightly after setting a fracture or reducing a dislocation. It is so-called from the medicinal paste which is applied to the affected parts, underneath the splints.

Dunglison mentions a bandage called Accipitar to be applied over the nose. It is so called from its likeness to the claws of a hawk. It resembles the pañcāngī bandage of the Hindus.

So the bandages are recommended to vary according to the different parts of the body ; and the surgeon, using his discretion, is to select the form of bandage suitable to the part. The bandages are recommended to be firmly secured to their place by three strings, applied upwards, downwards and obliquely. The knot is avoided over the seat of ulcer and tied on a side.

Suśruta says : “Bandages are applied with three degrees of tightness according to the seat of the abscess :—
 1. A tight bandage causes uneasiness but not actual pain ;
 2. A loose bandage is loose and relaxed ; 3. An even bandage is properly applied—neither tight nor loose. The tight bandage is to be applied to the buttocks, sides of the abdomen, axilla, groin, chest and head. The eyes and joints

¹ हन्तस्थिनी समानीय हनुसन्धौ विसंहते ।

खे दधिला स्थिते सम्यक् पञ्चाङ्गौ वितरेद्धिष्ठक् ॥

Suśruta Saṃhitā, IV. iii.

² अस्थिभग्म च्युतं सन्धिं संदधीत समं पूनः ।

समेन सममङ्गेन क्लवलान्येन विचक्षणः ॥

स्थिरैः कवलिकावन्मैः कुशिकाभिश्च संस्थितम् ।

षट्टैः प्रभूत सर्पिष्ठैर्भूयादवलं सुखः ॥

Caraka Saṃhitā, VI. xiii.

are loosely bandaged. The even bandage is for the extremities, face, ears, neck, penis, scrotum, back, sides, and abdomen.”¹

Suśruta next deals with the alterations in the mode of applying bandages according to the rules laid down. He also advises the surgeon to be guided by the dictates of his common sense. He directs us to practise bandaging on the various large and small limbs of a human figure made of cloth or clay.²

With regard to the mode of application of bandages, Hippocrates says:³ “It should be done quickly, without pain, with ease and with elegance, it should fit well and neatly. The forms of it are the simple, the slightly winding (called ascia), the sloping (sima), the monoculus, the rhombus, and semi-rhombus”.

The whole chapter of Suśruta is very interesting and will repay perusal. If bodily transferred, it will adorn any modern text book on surgery.

As it is very difficult to covey a correct idea of these bandages in words, I have given figures of them from modern works on surgery, from which their construction and uses will be readily understood at a glance.

¹ तत्र ब्रणायतनविशेषाहम् विशेषस्त्विधो भवति गाढः समः शिथिल इति ।

पौड़यन्नरुजो गाढः सोच्चासः शिथिलः स्मृतः ।

नैव गाढो न शिथिलः समोवम्भः प्रकौर्चितः ।

तत्र स्फिक् कुचि कच्चावङ्घणीरः शिरः सुगाढः । शारदावदन कर्णकर्णभेदसुक्षपृष्ठपाश्वै-दरस्स समः । अच्छोः सम्बिषु च शिथिल इति ।

Suśruta Samhitā, I. xviii.

² पुस्तमय पुरुषाङ्ग प्रत्यङ्गविशेषेषु वन्धयोग्यं ।

Ibid, I. ix.

³ The Genuine Works of Hippocrates, Vol. II, P. 477. Syd. Soc. Ed.

ABDOMINAL BINDER.

Caraka¹ mentions the use of abdominal binder for the recently delivered woman to prevent derangement of air by its expansion in her abdomen.

Dr. Barnes says:² "The sudden expulsion of one-tenth of the body-weight from the abdominal cavity is attended by a sudden removal of a force hitherto pressing upon the vessels and organs of the chest, abdomen, and pelvis. This entails in some cases a tendency to vacuum. Hence disturbance of the circulation. Now, the binder, by supporting the abdominal walls, restores the equilibrium of pressure. The pressure exerted upon the uterus works as a gentle continuous stimulus to contraction. The woman is conscious of the support and is grateful for it. The figure, so precious, and rightly so, to women, is better preserved So applied, the binder becomes one of the most efficient agents in antiseptic midwifery; it keeps the walls of the uterus and vagina in contact, thus preventing the collection of fluids or clots, and shutting out air".

The use of cloth for other surgical purposes is also mentioned:—

FIELD HOSPITAL.

The cloth is to be used for the manufacture of tents for the doctors to live in. The wounded in war are to be treated in such tents. The tent of the surgeon-general should be close to that of the king in the battle-field.³

¹ विष्ट्येददरं महता वाससा तथा तस्या न वायुरुदरे विक्रितिमुत्पादयत्यनवकाशत्वात् ।

Caraka Samhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II. p. 87.

³ स्तम्भावारे च महति राजगीहादनन्तरं ।

भवेत् सन्निहितो वैद्यः सर्वोपकरणान्वितः ॥

Small tents are also recommended for applying vapour bath to patients.

DRESSINGS.

Dṛḍhavala¹ mentions the use of medicated gauzes to be used as sponge by the females and says : "In discharges from the vagina, pieces of cloth soaked in decoction of barks of Vata (*Ficus Bengalensis*) and Lodha (*Symplocos racemosa*) and dried, should be put inside the canal."

In the *Mohāvāgga*² we find the use of itch-cloth :— "I allow, O Bhikkhus, to whomsoever has the itch, or boils, or a discharge, or scabs, the use of an itch-cloth".

"According to the 90th *Pakittiya* such cloth must not be more than four spans in length and two in breadth."

I can not help quoting from *Mohāvāgga*,³ another discourse of Buddha as it shows clearly the surgical treatment of boils in ancient times :—

Now at that time a certain Bhikkhu had boils.

"I allow, O Bhikkhus, the use of the lancet".

Decoctions of astringent herbs were required.

"I allow, O Bhikkhus,"decoctions of astringent herbs".

Sesamum salve was required.

तवस्थमेनं धजवद्यशः ख्याति समुच्चितं ।

उपसर्पन्त्यमोहेन विषशत्यामयद्विताः ॥

Suśruta Saṁhitā, I. xxxiv.

¹ व्यग्रोधलक् कषायेण लौप्रकल्पं तथा पिवेत् ।

आस्त्रावे चौमपट्टं वा भावितं तेऽनुधारयेत् ॥

Caraka Saṁhitā, VI. xxx.

² *Mahāvāgga*. VIII. 17, 2.

³ *Ibid.* VI. 14, 4 & 5.

“I allow, O Bhikkhus, the use of sesamum salve”.

5. Compresses were required.

“I allow, O Bhikkhus, the use of compresses.”

It was necessary to tie up the sore with cloth.

“I allow, O Bhikkhus, the use of bandages for tieing up wounds”.

The sore itched.

“I allow you, O Bhikkhus, the sprinkling of a sore with mustard-powder”.

The sore became moist.

“I allow you, Bhikkhus, to fumigate (the sore).”

Proud flesh formed on the wound.

“I allow you, O Bhikkhus, to cut off (proud flesh) with a lancet”.

The wound would not close up.

“I allow, O Bhikkhus, the use of oil for wounds”.

The oil ran over.

They told this thing to the Blessed One.

“I allow, O Bhikkhus, the use of fine rags, and of all kinds of ways of treating wounds”.

If the object of fumigating the sore was to sterilize it, as it certainly was, we may take this dialogue as the best sketch of the scientific treatment of boils,—remembering that it represents the knowledge of surgery more than 2500 years ago.

Cakrapāṇi advises us to tie the ends of the hairs of a patient, by a piece of cloth,¹ before performing phlebotomy on the vessels of the head and neck.

¹ सृदुपद्मात्केशान्ती जानुस्थापितकंपरः ।

4. CARMA OR LEATHER.

The use of leather in ancient medical practice in India was manifold.

Leather bandage.

Straps or belts of leather were used as bandages. Suśruta¹ advises us to apply the leather bandage in cases where more than half the thickness of the upper or lower extremities are cut by some sharp instruments in a slanting direction. Then the parts of the wound should be well adjusted, the bone and the soft parts kept in apposition, and the wound closed by sutures and well covered by dressings, over which the leather bandage is to be applied in the form of a gophaṇā or sling.

Leather bandage in the form of gophaṇā is mentioned by Suśruta² to be applied over the anus to prevent recurrence of procidentia of the rectum. The prolapsed bowl should be well bathed with ghee and fomented; and then reduced by gentle pressure. There should be a hole in the bandage just in front of the anus to allow flatus to pass out. Vṛnda³ alludes to it. Similarly the modern surgeons use a pad supported by a bandage as an aid in

¹ See foot-note 1, P. 178.

² गुदसंशे गुदं स्तिनं स्तेहाभ्यक्तं प्रवेशयेत् ।

कारयेदगोर्फणावन्धं भृच्छिद्रेण चर्मणा ॥

Suśruta Saṃhitā, IV. xx.

³ गुदभंशे गुदं स्तेहैरभ्यज्याऽग्नु प्रवेशयेत् ।

प्रविष्टं स्ते दयेचापि वज्जं गोःफणया भृशम् ॥

गोःफणयेति । गोःफणा वन्धविशेषः ।

नक्तं हि:—उच्चारनिर्गमाथ सच्छिद्रेण चर्मणा चास्य गोःफणावन्धः कार्यं इति ॥

preventing descent of the gut. It is mentioned also in the Cakradatta¹ and the Yogaratnākara.²

Dṛḍhavala mentions the use of a piece of untanned leather to be applied over a layer of ointment during the day, while during the night the leaf of Eranđa (*Ricinus communis*) is directed to be used.³

LEATHER LIGATURES.

In the treatment of snake-bite, a ligature is advised to be used above the seat of injury to stop the circulation of poisoned blood. This ligature is advised to be made of leather, or braided fibres of trees, or soft cord of jute, etc.⁴

YANTRA-SĀTAKA. LITHOTOMY STRAP OR BINDING APPARATUS.

This is the name of the leather shackle, which is recommended to be used during the operation for stone in the bladder. The patient should flex his knees and elbows; and the parts are to be

¹ गुदभंशे गुदं स्वेहैरभ्यन्याऽऽगु प्रवेशयेत् ।

प्रविष्टे स्वेदयेच्चापि बङ्गं गोःफणया ढदम् ॥

Cakradatta, Kṣudraroga Cikitsā.

² गुदभंशे गुदं स्विन्नं स्वेहेनाक्तं प्रवेशयेत् ।

प्रविष्टं रीधयेदयबाद्रव्यसच्छिद्रं चर्मना ॥

Yogaratnākara, P. 343.

³ एरख्यपदैः प्रक्षाय रात्रौ कल्यं विमोक्षयेत् ॥

चौराम्बूषणात्तः सिक्तं पुनश्चैवोपनाहितम् ।

मुच्चेद्रात्रौ दिवावङ्गं चर्मभिश्च सुलोमभिः ॥ ६४ ।

Caraka Saṁhitā, VI. xxviii.

⁴ सञ्ज्ञेरेवादितः सर्पः शाखादश्य देहिनः ।

दंशस्योपरि वज्ञीयादरिष्टाश्चतुराङ्गुले ॥

झोतचर्मान्त-वल्कानां स्फटुनान्यतमेन च ।

न गच्छति विषं देहमरिष्टाभिर्निवारितं ॥

Suśruta Saṁhitā, V. v

tied together by this instrument.¹ Similarly, it is to be used during the operation for piles; but then, according to Suśruta,² the neck and thighs are to be tied by the instrument which is to be held firmly by the assistants. Vāgbhaṭa³ uses cloth instead of leather.

Yantra-śāṭaka is also to be used during the operation of phlebotomy. Suśruta says⁴: "If venesection is required to be done, the patient is to be seated on a stool, an aratni high (from the elbow to the end of the little finger), facing towards the sun. The thighs are to be flexed, the two elbows to be placed over the knees, and the hands (the fingers being clenched into fists) to be fixed on the two sides of the neck. The two ends of the shackle which pass over the fists, are held up at his back by the left hand of an assistant, who with his right hand steadily (neither forcibly nor loosely) presses above the part selected, to make the veins prominent, and at the same time rubs on the back to

¹ सङ्कुचितजानुकर्पुरमितरेण सहाववद्धं स्त्रेण शाटकैर्बा ।

Suśruta Saṁhitā, IV. vii.

² वस्त्रकम्बलकोपविष्ट् यन्वशाटकेन परिचित्त ग्रीवासकथं परिकर्म्मिभिः सुपरिगृहीत-मस्यन्दनशरीरं क्लत्वा ।

Ibid, IV. vi.

³

अथ यन्त्रेण वाससा ।

सकथो शिरोधरायात्रं परिचित्त मनुस्थितम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, IV. viii.

⁴ तत्र व्यथसिरं पुरुषं प्रत्यादिव्यमुखमरविमाचोक्तिं उपवेश्यासने सक्थोराकुञ्जितयो-र्निवेश्य कूर्परसन्धिवथस्योपरि हस्तावन्तर्गृद्धाङ्गक्षतमुष्ठी मन्ययोः स्थापयित्वा यन्वणशाटकं ग्रीवामुष्ठोरुपरि परिचित्यान्वेन पुरुषेण पश्चात् स्थितेन वामहस्तेनोत्तनेन शाटकान्दंयं गाहयित्वा ततो वैद्यो त्रूपाद्विचित्रावस्तेन सिरोत्तापनार्थं नाभ्यायतशिथितं यन्वमावेष्टयेत्यस्तक्खावणाथै यन्त्रं पृष्ठमध्ये च पीडयेति कर्त्त्वं पुरुषवत् वायुपूर्णमुखं स्थापयेदेष उत्तमाङ्गतानामन्तर्मुख-वर्ज्यनां सिराणां व्यधेन यन्वणविधिः ।

Suśruta Saṁhitā, III. viii.

stimulate bleeding, the patient being then told to inflate his mouth with air forcibly. This is the method of binding for puncturing the veins of the head except those (veins) which have their mouths turned inside the body". Vāgbhaṭa describes a similar procedure in bleeding from the vessels of the neck¹.

The Greeks also used ligatures to tie up the arms and legs of a patient in the lithotomy position. Paul² says: "In operating, the woman should be placed on a seat in a supine posture, having her legs drawn up to the belly, and her thighs separated from one another. Let the arms likewise be brought down to her legs and secured by proper ligatures about the neck".

In modern times, similarly, we use lithotomy straps or crutch, after placing the patient in the lithotomy position during the operation of lithotomy and excision of piles.

PĀŚA.

This is a different shackle to be used for binding insane persons.³

¹ अग्नितापातपस्त्रिग्धो जानूच्चासन संस्थितः ।

मृदुपट्टात्केशान्तो जानुस्थापित कूर्परः ॥

सुषिष्यां वस्त्र गर्भाभ्यां मन्ये गाढः निपीड्येत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvii.

² Paul. VI. lxxiii.

³ भीमाकारैर्नरैर्नागैर्दान्तैर्बालैश्च निर्विष्टैः ॥

भीषयेत् सततं पाशैः कशाभिर्बाध ताडयेत् ।

यन्वयित्वा सुषुप्तं वा चासयेत् दृष्टाग्निना ।

Suśruta Saṃhitā, VI. lxxii.

ABDOMINAL BINDER.

The use of cloth binder has been described before¹. Leather binder is to be used after the operation of paracentesis abdominis to apply pressure over the abdomen. After draining the fluid of ascites, the abdomen of the patient should be well wrapped with blankets, or silk cloth, or leather binder, for then the abdomen would not be flatulently distended by air.²

LEATHER BAGS.

The use of leather in the formation of bags of the vastiyantra has been described before³.

ŚIRO-VASTI. LEATHER BAG FOR THE HEAD.

For application of oil on the head, Suśruta⁴ directs us to use a goat's bladder filled with medicated oil, just in the same way as ice bags are used nowadays.

Śāringadhara⁵ describes another variety of śiro-vasti : "It is

¹ See P. 181..

² निःखु तेच दोषे गाढ़तरमाविक काशीय चर्मग्णामण्यतमेन परिवेष्टयेदद्वरं तथा नाभापथनि वस्तुः ॥

Suśruta Saṁhitā, IV. xiv.

³ See P. 129-30.

⁴ कृज्ञासीनस्य वज्जीयाद् वस्तिकोषं ततो दृढ़ ।

Ibid, VI. xviii.

⁵ शिरोवस्तिविधिशास्रं प्रोच्यते सुज्ञसच्यतः ।

शिरोवस्तिशर्मणः स्वाविसुखो द्वादशाङ्गुलः ॥

शिरःप्रमाणं तं वद्वा मस्तके मावपिष्ठकैः ॥

सम्बिरोधम्बिधायादौ स्फेहैः कोणैः प्रपूरयेत् ॥

तावत् धार्थस्तु यावत् स्वान्नासानेच्चमुखस्तुतिः ।

विद्वनोपशमो वापि माताणां वा सहस्रकम् ॥

Śāringadhara Saṅgraha, III. xi.

made of leather, has a length of twelve aṅguli and has two orifices or mouths. The leather bag is to be well tied round the head, the junction of the circumference of the bag and the skin should be well pasted with māṣa (Phaseolus Rox) glue. Then the cavity thus formed is to be filled with hot oily medicine. This is to be retained until the headache is relieved.” Cakradatta¹ also mentions it. The bag is described to be sixteen aṅguli high in the Yogaratnākara². Vāgbhaṭa³ advises us to use leather of a cow or buffalo, and it is said to have been twelve aṅguli broad.

LEATHER BAND.

In phlebotomy, a band is advised to be applied above the spot where the vein is to be punctured. This band is recommended to be made of cloth, or jute, or leather, or barks of

¹ आशिरो व्यायतं चर्म ललाटाङ्गुलसुच्छ्रितम् ॥
तेनावेद्य शिरोऽधस्तान्माषकल्केन लिपयेत् ।
निश्चलस्त्रीपविष्टस्य तेलैरुचौः प्रपूरयेत् ॥

Cakradatta, Siro-roga Cikitsā.

² आशिरो वापितचर्म घोड़शाङ्गुलसुच्छ्रितम् ।
तेनावेद्य शिरोऽधस्तान्माषकल्केन लिपयेत् ॥

Yogaratnākara, P. 402.

³ विषिस्तस्य निषस्तस्य पौटे जानुसमे मृदौ ।
शुद्धाक्तस्त्रिन्देहस्य द्विनान्ते गव्यमाहिषम् ॥
हादशाङ्गुलविस्तीर्णं चर्मपटं शिसः समम् ।
आकर्णवन्धन स्थानं ललाटे वस्त्र वेष्टते ।
चैलवेणिकथा वहा माषकल्केन लिपयेत् ॥
ततो यथाव्याधि शर्तं स्वेहं कोणं निषेचयेत् ।
जर्जं किशभूवो यावहाङ्गुलं धारयेच तम् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxii.

trees, or tendrils of twining plants¹; and it should not be applied either too tight or too loose. As for example, in phlebotomy in the foot, the yantra-sāṭaka or ligature should be applied below the knee-joint, while the band is to be tied round, at a distance of four aṅguli above the part selected for the operation.² Vāgbhaṭa³ says: “In phlebotomy, a band is to be tied round the upper extremity, four aṅguli above the spot selected for opening the vein which is to be made prominent by pressing it upwards with the closed fist.” Cakradatta⁴ also quotes it. Vāgbhaṭa⁵ recommends us to use a cloth band to be tied round the leg, four aṅguli above the spot selected for opening the vein in the leg.

This band corresponds to the band of Antyllus used by the Greeks. Antyllus applies a ligature of two fingers’

¹ गांवं वज्जोपरि दृढं रञ्जा पटेन वा समम्।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

वस्त्रपट्टचर्मान्तर्वल्कलतानामन्यतमेन यन्त्रित्वा नातिगाढं नातिश्चिलं शरौर प्रदेशमासाद्य यथोक्तं शस्त्रं रुद्धीता सिरां विष्ठेत्॥

Suáruṭa Saṁhitā, III. viii.

² तत्र पादव्यध्यसिरस्य पादं समेष्याने सुस्थिरं स्थापयित्वाच्यं पादमीषतस्तद्वितमुच्चैः कल्पा व्यध्यपादं जानुसन्वेरवः शाटकेनविष्य हृस्ताभ्यां प्रपोद्य गुलूफं व्यधप्रदेशस्योपरि चतुरझुलम् झोतदैनामन्यतमेन वज्ञां पादासिरां विष्ठेत्॥

Ibid.

³ विष्ठेऽङ्गस्तशिरां वाहावनकुचित् कूर्पेरे।

वज्ञा सुखोपविष्टस्य सुटिमङ्गुष्ठ गर्भिनीम्।

ऊङ्डं वेष्यप्रदेशाच्च घटिकां चतुरझुले॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

⁴ Cakradatta, Śira-vyādhādhikāra.

⁵ पादे तु सुस्थितेऽधसाज्जानु समेनिपौडिते।

गाढं कराभ्यामागुलूफं चरणे तस्य चोपरि॥

हितौये कुचिते किञ्चिदाहुढे हस्तवच्चतः।

वज्ञा विष्ठेत् सिरामित्यमनुकौश्चपि कल्पयेत्॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

breadth round the arm in bleeding at the elbow, while to bleed at the ankle, the band is to be applied at the knee. It is mentioned as fillet in the pseudo-Hippocratic treatise on Ulcers;¹ and Oribasius² gives an interesting dissertation on the subject, principally condensed from the works of Herodotus, Antyllus and Galen. Paul³ also ties a narrow band round some muscular part of the arm before abstracting blood from the inner part of the elbow. “Wherefore we must tie a narrow band around some muscular part of the arm, and having by friction of the hands upon one another produced the necessary fulness of the vein, we divide it transversely, but only along its breadth.”

LEATHER BOTTLES, JARS, MAŞAKA, etc.

Leather was used in the manufacture of bottles and jars. Leather maşaka for honey, Soma juice, and dadhi (curdled milk), is mentioned in the R̄gveda⁴ and also in the Laws of Manu where

¹ Ulcers, iii. 328.

² Med. Collect., vii, Phlebotomy.

³ Paulus Aegineta. Adam's Trans. Bk. VI. Sec. XL.

⁴ दृतेरिव तेऽवकमस्तु सर्वं ।

अच्छिद्रस्य दधन्वतः सुपूर्णस्य दधन्वतः ॥

R̄gveda, 6 M. 48 S. 4 A. 8 Ch. 18 v.

यो ह वां मधुनो दृतिराहितो रथचर्षणे ।

ततः पिवतमश्चिना ॥

Ibid, 8 M. 5 S. 5 A. 8 Ch. 19 v..

उच्छिदं चम्बोर्मं सोमं पवित्र आ सूज ।

नि धिहि गोरधि लचि ॥

Ibid, 1 M. 28 S. 1 A. 2 Ch. 9 v.

एष सोमो अधि लचि गवां क्लीड़त्यद्विभिः ।

इन्द्रं मदाय जोहुवत् ॥

Ibid, 9 M. 66 S. 7 A. 2 Ch. 29 v.

it is called *dṛti*¹. Leather *māṣaka* or inflated skins were in use as swimming bladders, and we have a representation of "figures with garlands in their hands, swimming and disporting themselves, supported on *māṣaks* or inflated skins."² In the R̄gveda, Agastya in his spell to neutralise poison, says:³ "I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits."⁴ Dr. Mitra points out that "other smṛtis ordain that oleaginous articles preserved in leather bottles do not become impure by the contact of the impure cowhide; and in the present day, jars of that material are in extensive use in Bengal and the North-West Provinces for the storage of oil and ghee. In the latter place, leather bags are universally used for raising water from wells, and

हवति भौमो हषभस्त्रिविषया शङ्खे शिशानो हरिणी विचक्षणः ।

आ योनिं सोमः सुक्षतं नि धौदति गव्ययो त्वग्भवति निर्णिगव्ययौ ॥

R̄gveda, 9 M. 70 S. 7 A. 2 Ch. 7 v.

एष स्य भानुरुद्दियर्ति युज्यते रथः परिज्ञा दिवो अस्य सानवि ।

पृच्छासी अस्मिन्निष्ठुना अधि चयो द्विक्षूरीयो मधुनो वि रप्शते ॥

Ibid, 4 M. 45 S. 3 A. 7 Ch. I v.

See Wilson's R̄gveda, II. 28.

¹ इन्द्रियाणां तु सर्वेषां यदेकं चरतीन्द्रियम् ।

ततोऽस्य चरति प्रज्ञा दृते: पादादिवौदकम् ॥

Manu Samhitā, II. 99.

"But when one among all his organs fails, by that single failure his knowledge of God passes away, as water flows through one hole in a leathern bottle."

Ihid, Jones' Translation.

² Pl. xxxi. fig. 1. Fergusson's Tree and Serpent Worship, P. 127.

³ सूर्ये विषमा सजानि दृतिं सुरावती गृहे ।

R̄gveda, 1 M. 191 S. 2 A. 5 Ch. 10 v.

⁴ Ibid, Wilson's Translation.

according to the law books of Śaṅkha and Likhita,¹ that water is declared pure which is kept in old leather bottles². To this may be contrasted the prevailing Hindu notion that water is defiled if touched by a Brāhmaṇa in his shoes. Though the leather is not allowed to be a material of dress of the Hindus, except his shoes which are considered as unclean, leather belts formed one of the eight sacred utensils necessary for a śramaṇa of the Buddhist order ; and in the Manu Saṁhitā³ we find the students of theology advised to “wear for their mantles, the hides of black antelopes, of common deer, or of goats.”⁴

5. ANTARVALKALA. THE INNER BARKS OF TREES.

Barks of trees are recommended to be used as splints for the support of fractured bones. In fractures of bones of the foot, leg and thigh, Suśruta directs us to use splints made of barks of trees⁵ to surround the limbs. In the treatment of a simple fracture, Bhāva Miśra advises us to use cold water first, then mud is to be applied, and lastly the fractured bones should be secured

¹ आपो रूपवदगम्बवत्यः परिशुद्ध जीर्णचर्मकररण्ड कैवभ्युद्गुताः ।

चर्मकररण्डः चर्मपुटः ।

Śaṅkha and Likhita.

² Dr. R. C. Mitra's Indo-Aryans. vol. II.

³ कार्ष्णरौरववास्तानि चर्माणि व्रज्ञचारिणः ।

वसीरनानुपूर्वेण शाण्छौमाविकानि च ॥

Manu Saṁhitā, II. 41.

⁴ Ibid. Sir Wm. Jones' Translation. II. 41.

⁵ अभ्यज्य सर्पिष्वापादं तलभश्च कुशोत्तरं ।

वस्त्रपट्टेन वस्त्रीयान्नच व्याघ्राममाचरेत् ॥

Suśruta Saṁhitā, IV. iii.

by splints and bandages.¹ In the Yogaratnākara², we are advised to treat fractures, by lowering the raised end and elevating the depressed end of the bone, and then by using splints and bandages to keep them in position. Bhāva Miśra³ describes it similarly after Suśruta. Suśruta directs us to use barks of Vata (Ficus Indica. Rox.) and bamboo strips as splints to support the neck after reducing its dislocation by holding at the temporo-maxillary articulations on the sides and the occipital protuberance on the back, and raising him up in the air. He should lie down with his head raised for seven days⁴. In modern times, the Sayre's suspension apparatus and jury mast serve the same purpose.

The barks of Madhuka (Bassia latifolia), Aśvattha (Ficus religiosus), Kukubha (Terminalia arjuna), Polāśa (Butea frondosa, Rox.), Udumbara (Ficus glomerata, Rox.) bamboo, sāla (Shorea robusta), Vata (Ficus Indica. Rox.) are mentioned as

¹ आदौ भग्नं विदिला तु सेचयेच्छीतलाग्नुना ।

पङ्कनालिपनङ्कार्यं वग्ननच कुशान्वितम् ॥

Bhāva Prakāśa, II. iii. Bhagnādhikāra.

² पङ्कनालिपनं कुर्याइस्वनं च कुशान्वितम् ।

अवनामितमुन्नायोदुन्नतं चावपौड़येत् ॥

क्षिप्तं विधापि च स्थाने संस्थाप्य विधिमाचरेत् ॥

Yogaratnākara, P. 345.

³ अवनामितमुन्नते दुन्नतचावपौड़येत् ।

आञ्जेदतिच्चिप्तमधोगतचोपरि वर्तयेत् ॥..

Suśruta Saṁhitā, IV. iii.

Bhāva Prakāśa, II. iii. Bhagnādhikāra.

⁴ अवटावथहन्त्रीश्च प्रगृह्णीन्नमयेन्नरं ।

तथा कुशान् समंदत्ता वस्त्रपट्टे न वेष्टयेत् ।

उत्तानं शाययैच्चैनं सप्तरावमतच्छ्रितः ॥

Suśruta Saṁhitā, IV. iii.

supplying the materials of splints¹. Bhāva Miśra² adds Kadamba (Anthocephalus cadamba), Hijjala (Barringtonia acutangula), Sarjja (Pinus longifolia) to the list. Such splints are called kuśa, and Vāgbhāṭa³ says that the splints should be broad, thin, pliant and clean.

Dr. Jacobi, of Dublin, says that he has seen an excellent splint made from the “fresh bark of a tree, taken off while the sap is rising”. “It fits admirably”, says he, “just like paste-board soaked in water”⁴. Dr. C. C. Jewet⁵ recommends for the same purpose the bark of Leriodendron, or tulip tree.

THE CRUTCHES.

The crutches were used to help the crippled. In the Vajasiṇiya Saṁhitā of the White Yayurveda, there is a passage describing the different kinds of human victims, appropriated to particular gods and goddesses. The passage occurs also in the Taittirīya Brāhmaṇa with slight differences. There we

¹ मधूकोदुर्वाशत्य पलाश कुम्भत्वचः ।
वंशसर्ज वटानां वा कुशार्थसुपसंहरेत् ॥

Suśruta Saṁhitā, IV. iii.

² मधुकोदुर्वाशत्य कदम्ब निचुलत्वचः ।
वंशसर्जनानाच्च कुशार्थसुपसंहरेत् ॥

Bhāva Prakāśa, II. iii. Bhagnādhikāra.

³ कदम्बोदुर्वाशत्यसर्जार्जुन पलाशजैः ।
बंशोङ्गवै वा पृथुभि सतुभिः सुनिवेशितैः ॥
सुशक्त्यैः सुप्रतिस्तम्भै वैलक्ष्मैः शकलैरपि ।
कुशाह्रयैः सम वस्त्रं पद्मस्त्रोपरि योजयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxvii.

* Hamilton's Fractures and Dislocations. 5th Ed. P. 50-51.

⁵ The 20th Mass. vols.

find "to the two (deities) who preside over the gains above or below one's expectation (utkula and vikula), a cripple, who can not move even with the help of a crutch" is recommended to be sacrificed. And again "to the divinity of land, a cripple who moves about on a crutch."¹

The use of the sound limb as a splint of support for the fractured bone of the opposite side was well known. Wooden splints resembling in shape the injured member are also recommended. Suśruta says² that if the hand be fractured, it is to be tied with the opposite hand, but in fractures of both the hands, Gayadāssa³ recommends a wooden hand to be used as a splint for both. After union of the fractured bones, the hands should be made to hold balls of cow-dung, mud and stones.

6. LATĀ OR CREEPERS (TENDRILS OF).

The tendrils of creepers as materials of ligature are mentioned

¹ उत्कुलविकुलाभ्यां (उत्कुलविकुलेभ्यः) विस्थितं ।

भूम्ये पौठसर्पिनमालभते ।

Taittiriya Brāhmaṇa.

Quoted in Mitra's Indo-Aryans. vol. II. P. 84—85.

² उमे तत्त्वे समे क्षत्वा तत्त्वभग्नस्य देहिनः ।
वज्ञीयादामतैलेन परिषेकच्च कारयेत् ।
प्राग् गीमधमयं पिण्डं धारयेन् मृणयं ततः ।
हस्ते जातवलेचापि कुर्यात् पाष
॥

Suśruta Saṃhitā, IV. iii.

³ गयोतु उमेऽपि हस्ततत्त्वे तवेकस्य भङ्गे वासं दक्षिणेन दक्षिणं वासेन, उमथोसुभङ्गेन तत्समेन, काष्ठमयेन क्षत्वा इति अपि वज्ञीयादिवं दार्ढः भवतीति, मृत्पिण्डादिधारणमात्रकर्त्त्वं प्राप्तपूर्वम् ।

Quoted in Dallana's Commentary, IV. iii.

by Suśruta. He recommends¹ to give up a patient, bit by a snake, as hopeless when he does not respond to the application of stimuli, such as cold water, tendrils of creepers, etc. Vāgbhaṭa² advises us to introduce the stalk of the lotus, with a thread tied to it, inside the throat to extract any foreign body stuck there. When the soft stalk is touched by the śalya, it should be extracted by the sudden withdrawal of the stalk and thread.

7. VĀSTRA OR CLOTH.

Cloth³ as a material of bandages, tents, gauze, etc. has been described before⁴

8. AŚTHIĀŚMA. STONE OR PEBBLE.

It is a piece of stone—long and round. It is advised to be used for moving arrows fixed in the bone⁵. Caraka⁶ advises us to strike two pieces of stone against each other to resuscitate a

¹ अजीर्ण पित्तातप पोडितेषु वालप्रमे हेष्यथ गर्भिनौषु ।

वडातुर चौण्डुसुचितेषु रक्तेषु भीरध्यथ दुर्द्विनेषु ॥

शस्त्रचते यस्य न रक्तमस्ति राज्योलताभिश्च न सम्बवन्ति ।

शोताभिराङ्गिश्च न रोम हर्षीं विषाभिस्थूतं परिवर्जयेत् ॥

Suśruta Saṃhitā, V. iii.

² करुद्धातोगते शत्य सूत्रं करुदे प्रवेशयेत् ।

विसेनात्ते ततः शत्यं विसं सूत्रं समं हरेत् ॥

Aśtāṅga Hṛdaya Saṃhitā, I. xxviii.

³ वस्त्रं प्रसिद्धं तूलकं सूत्रनिर्मितं वेष्टनार्थं प्रयुज्यते ॥

Vāgbhatārtha Kaumudī, I. xxv.

⁴ See P. 176-83.

⁵ अश्मप्रस्तरखण्डं शस्त्रपौडनार्दं निर्वातनाञ्च युज्यते ॥

Ibid.

⁶ अश्मनोः संघटनं कर्णयामुखे शौतोदकेनोषोदकेन वा मुखपरिषेकः ।

Caraka Saṃhitā, IV. viii.

still-born child. In bleeding from the veins of the neck, Vāgbhata¹ advises the patient to hold firmly two pieces of stones in their hands.

A piece of stone is to be used by a person, for holding it with his hand, after recovery from fractures of the carpal and metatarsal bones².

In ancient times, in India, the kings used to decorate themselves with antidotal gems, as a safeguard against poisons.³ Even now the snake charmers apply a black stone on their bodies where they are wounded by the venomous reptile. This stone is popularly known as the vi-a-pāthara or poison-stone, and is supposed to have the property of extracting poison from the body.

9. MUDGARA. HAMMER.

Suśruta directs us to use a hammer or a piece of stone to strike an arrow firmly fixed in the bone, until loosened, when it can be conveniently extracted by means of a pair of forceps⁴. It should be pointed out that the tubular instrument—śalya

¹ पाषाणगम्भस्तस्य जानुश्चे प्रस्तते भूजे ।

कुचेरारभ्य सदिते विषेहङ्गोर्धपट्टके ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvii.

² See foot-note. 2. P. 196.

³ विषद्वैरुदकै सातो विषद्वमण्ड्यभूषितः ।

परीचितं समन्वयागाङ्गुलाविन्निषग्नृतः ॥

Kāmandakīya Nītiśāra, Ch. vii. v. 10.

रचितो गडुरोङ्गार मस्तिष्यस्य विभूषणं ।

स्थावरं जङ्गमं तस्य विषं निर्बिंधितां ब्रजेत् ॥

⁴ अस्थिदेशोत्तुष्ठित मषीलाम्भमुङ्गराणामन्यतमस्य प्रहरेण विचाल्य यथामार्गमेव ।

Suśrūta Saṃhitā, I. xxvii.

nirghātānī—described before¹, served the same purpose. Vāgbhaṭa also uses a hammer² to shake an arrow fixed in the bone, and directs us to extract it with the hands or by the various kinds of forceps³.

The Greeks used some iron instrument to shake such an arrow from the place where it was lodged. The hammer was also used by the Greeks and Romans but in a different capacity. Paul mentions its use in cranial surgery to strike the lenticular and gouge⁴. Paul and Celsus describe a “method of extracting foreign bodies from the ear by laying the patient on a board and striking the under side with a mallet.”⁵ Vāgbhaṭa describes this method for draining out water from the ear.⁶

10. PĀNIPĀDATALA. THE PALM OF HAND AND SOLE OF FOOT.

11. AṄGULI OR FINGERS.

The surgeon's hand is considered by Suśruta to be the principal instrument as the use of all other instruments depends

¹ See P. 111.

² सुङ्गराहतया नाड्या निवील्योचुखितं हरेत् ।

तैरेव चानयेन्मार्गमार्गोचुखितं तु यत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

³ अधाहरेत् करप्राप्य वरण्येनेतरत् पुनः ।

दृश्यं सिंहाहिमकरवर्मि कर्कटकाननैः ॥

अदृश्यं ब्रह्मसंस्थानाद शहौतुं शक्वते यतः ।

कङ्ग भृङ्गाहृ कुरर शरारौ वायसाननैः ॥

Ibid.

⁴ Paulus Aegineta VII. xc.

⁵ Milne, Graeco-Roman Surgical Instruments, p. 125.

⁶ कर्णेऽरवु पूर्णे चक्षेन मथिला तेलवारिणी ।

चिपेदधीमुखं कर्ण हन्यादा चूषयेत वा ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

upon it¹. But again he mentions the hand and foot as accessory to, or substitutes for, the instruments. Longmore² says: "Of all instruments for making a complete examination of a gun-shot wound as well as for exploring for foreign bodies which may be lodged in it, the finger of the surgeon is the most appropriate, whenever a wound is large enough to admit of its insertion." There are many instances of the use of hand and foot in the treatment of surgical diseases but I shall point out a few of them.

1. Both Suśruta³ and Cakradatta⁴ say that "if a swelling be hard but slightly painful, then it should be well fomented, pressed and rubbed by a piece of bamboo, or palm of the hand, or thumb to cause its subsidence. Bhāva Miśra also quotes this verse⁵. Suśruta⁶ and Vāgbhaṭa⁷ recommend a similar treatment for enlarged glands.

¹ See foot note, P. 90.

² Longmore, Gun-shot Injuries, 1877, P. 319.

³ अभ्यज्य स्वेदयित्वा तु वेणुना वा श्वैः श्वैः।

विमर्द्येद्विषक् प्राचल्लेनाङ्गुष्ठकेन वा ॥

Suśruta Saṁhitā, IV. i.

⁴ अभ्यज्य स्वेदयित्वा च वेणुनाड्याततः श्वैः श्वैः।

विम्लापनार्थं स्फङ्गीशत् तलेनाङ्गुष्ठकेन वा ॥

Cakradatta, Vraṇaśotha Cikitsā.

⁵ अभ्यज्य स्वेदयित्वातु वेणुनाड्या श्वैः श्वैः।

विमर्द्येद्विषष्टमन्दल्लेनाङ्गुष्ठकेन वा ॥

Bhāva Prakāśa, II. iii.

⁶ हृतेषु दोषेषु यथानुपूर्वं गस्त्री भिषक् स्त्री समुद्धितेतु ।

सिन्नस्य विम्लापनमेव कुर्यादङ्गुष्ठलोहोपलवेणुदण्डः ॥

Suśruta Saṁhitā, IV. xviii.

⁷ मंसवेदा वहशीगम्यं विम्लीशत् पुनः पुनः ।

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxx.

2. Suśruta says¹ that “when a morsel of food sticks in the throat, a blow should be fearlessly struck with the fist on the shoulder of the patient without his knowledge”. Vāgbhāṭa² also describes it.

It is however curious to find that exactly the same procedure was adopted by Alsaharavius. Adams in his commentary³ on Paul says that “when a morsel of food sticks to the œsophagus, Alsaharavius directs that the person should be struck on the back, which will facilitate the descent of it”.

3.. In the reduction of dislocation of the lower jaw, Caraka used his fingers to do it exactly in the same way as recommended by the modern surgeons. He directs us to depress the lower jaw by the thumbs and at the same time to raise the chin by the index fingers⁴. The verses are quoted by Cakradatta.⁵ The description of the method, quoted from any modern text book, would be a good commentary on the above passage of Caraka. Erichsen says⁶: “The reduction is best effected, by the surgeon,

¹ ग्रासश्लयेत् कण्ठासक्ते निःशङ्खमनुबुद्धस्काम्ये सुट्टिनाभिहन्यात् स्वेहं मद्यं पानीयम् वा पाययेत् ।

Suśruta Saṃhitā, I. xxvii.

² अप्पान स्फन्द्यघाताभ्यां ग्रासश्लये प्रवेशयेत् ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

³ Adam's Commentary on Paulus Aegineta, VI. xxxii.

⁴ व्याक्तानने हनुं स्तिनमङ्गुष्ठाभ्यां प्रपीछ्य च ।

प्रदेशिनीभाष्मोद्भव्यं चिचुकोद्भवनं हितं ॥

स्वस्तां सङ्घमयेत् स्थानं स्वर्वा स्तिन्नं विनामयेत् ।

प्रत्येकं स्थानदूष्यादिक्रिया वैशेष्यमाचरेत् ॥

Caraka Saṃhitā, VI. xxviii.

⁵ Cakradatta, Vātabyādhī Cikitsā.

⁶ Surgery, Vol. II, p. 658.

standing before the patient, placing his thumbs, well protected by napkins, or a few turns of a narrow bandage, on the molar teeth on each side, and then depressing the angles of the jaw forcibly, at the same time that he raises the chin by means of his fingers spread out and placed underneath it.”

4. Caraka says¹ : “After pairing her nails and covering the tip of her index finger with cotton, the nurse is to clean the palate, lips and throat of the new-born child”.

With this passage we may compare what Barnes says on the point². “The attendant having then placed the child close to the mother, so as to avoid any strain on the cord, should cleanse its mouth from any fluids, such as blood and mucus, it may have partially swallowed during its passage through the vagina. This should be done at once, as such fluids drawn into the lung vesicles may give rise to inflammation of the lungs, or even septicæmia.”

5. “uśruta³ recognises “six modes of diagnosing diseases, namely by the five senses *i.e.* by hearing, smell, taste, sight and touch, and by questions. “Symptoms discernible by the sense of touch are coolness or heat, smoothness or roughness, softness or hardness, and other tangible qualities of the skin in fever, dropsy,

¹ अथाय ताल्पोष्टकण्ठ जिह्वाप्रमार्ज्जं नमारभेत अङ्गुल्यासुपरिलिखितनखया सुप्रकालितो-पधानकार्पासपिचुमत्या प्रथमं प्रमार्ज्जं तस्याय च शिरकालु कार्पासपिचुना द्वे हग्मेन प्रतिक्षादयेत् ।

Caraka Samhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II, p. 105.

³ घड्धिं धो हि रोगाणां विज्ञानोपायः । तद्यथा पच्चमि शोवादिभिः प्रश्नेन चेति ।

* * * * स्पर्शनेन्द्रियविज्ञेयाः श्रीतोष्णाश्वच्छ वर्कशम्भुकठिनलक्ष्यो ज्वरशीफादिषु ।

Suśruti Samhitā, I. x.

and other diseases." And we know how important it is to educate the tactile sense in the diagnosis of diseases.

6. The foot is recommended to fix a part of the human body whence any foreign body may be removed easily by the hands.¹ Suśruta says²: "If a foreign body cannot be easily extracted, as when it is impacted in the hollow or the substance of a bone, the part should be pressed by the feet, and it should be drawn out by the instrument." Vāgbhaṭa also gives a similar description³. Caraka describes a method of removal of the placenta if not spontaneously separated. One of the female attendants should press upon the navel of the peurpera forcibly with her right hand, while with the left hand placed upon her back, she should shake her. Then the heel is to be placed on the patient's buttock while the two sides of the gluteal regions are also to be pressed and shaken⁴.

12. JIHVĀ OR TONGUE.

The organ of taste as a means of diagnosis is noted by

¹ पाद इति पादेन शरीरदेशं धृत्वा हस्तादियन्ते ए उद्दरणादि क्रियते ।

Vāghaṭārtha Kaumudī, I. xxv.

² अस्थिविवरप्रविष्टं अस्थिविद्धं वाऽवगट्य वादभ्यां यन्ते णापहरेत् ।

Suśruta Saṃhitā, I. xxvii.

³ अस्थिदृष्टे नरं पदभ्यां पौड़यित्वा विनिर्हरेत् ।

इत्यशक्ये सुवलिभिः सुगृहीतस्य किङ्करैः ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

⁴ तस्याश्वेदमरा न प्रपन्ना स्वादथैनामन्यतमा स्त्री दचिणेन पाणिना नाभेष्यपरिष्ठावलवत् निपीड्य सब्येन पाणिना पृष्ठत उपसंगट्य सुनिर्ज्ञतं निर्जन्तुयात् । अथास्याः पादपार्षद्वाशोणीमाकोटयेदस्याः स्फिचावुपसंगट्य सुपीडितं पौड़येत् ।

Caraka Saṃhitā, V.

Suśruta¹. "Symptoms discernible by the sense of taste are the various tastes noticeable in morbid secretions of urine and other diseases". Cakrapāṇi "explains that 'inference' is necessary, because the sense of taste can not be exercised by the physician on the patient directly;"² he must do it through some intermediate agents such as ants, whose attraction to sugar is well-known and so the presence of sugar in urinary diseases can be inferred."

13. DANTA OR TOOTH.

Ivory as a material of surgical instruments has been described before³. Suśruta⁴ advises us to use the ash of ivory with stibium as a stimulant to the growth of hair on a scar. It is also recommended by Vāgbhaṭa⁵.

14. NAKHA OR NAILS.

Suśruta advises the surgeon to use his nails⁶ for the operation of cutting, piercing and extraction, if these can be possibly helped by his nails.

In modern times, nails often help the surgeons in separating

¹ रसनेन्द्रिविज्ञेयाः प्रमेहादिषु रसविशेषाः ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. x.

² Hœrnle's Commentary on the Suśruta Saṃhitā, I. x. (Bibliotheca Indica).

³ See page 67.

⁴ हस्तीदन्तमसीं कृता सुख्यच्चैव रसाञ्जनं ।

रोमाणेतेन जायने लेपान् पानितलेष्यपि ॥

Suśruta Saṃhitā, IV. i.

⁵ तैलाक्ता हस्तिदन्तस्य मषी वा चौषधं परम् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, VI. xxiv.

⁶ आहार्यच्छेदयमेदेषु नखं शक्येषु योजयेत् ।

Suśruta Saṃhitā, I. viii.

layers of tissues during operation as in the operation for the radical cure of hydrocele. We often extract thorns, impacted in our body, with our nails.

15. MUKHA OR MOUTH.

The use of mouth as a suction apparatus was well known to the ancients. Suśruta advises us to use ārā or pāṇimantha (awl) to perforate bone in diseases of the medullary canal, caused by obstructed and deranged air. He next introduces one end of a tube, open at both ends, into the canal through the perforation in the bone, while through the other end the surgeon sucks out air by his mouth¹. The use of mouth for sucking out air through the śṛiṅga or horn has been described before². Caraka says³ that the poison of a snake-bite may be sucked out by the surgeon's mouth, filled with flour or ash. Even in modern times, it is common amongst Indians to suck out blood, in accidental cuts by knives, by the mouth. The practice of the suckers in Europe has been noted before⁴.

16. VĀLA OR HAIR.

Horse-hair is to be used for applying ligatures round the piles⁵. It is also a material of suture for the skin. Horse-hair is also described to have been used for raising pterygium. Paul⁶ also used horse-hair to raise a pterygium.

¹ निरुच्छेऽस्थनि वा वायौ पाणिमन्थेन दारिते ।

नाड़ीं दक्षुास्थनि भिषक् चूषयेत् पवनं वली ॥

Suśruta Samhitā, IV. iv.

² See P. 148-49.

³ दंशं वा चूपिन्द्रूखेन थवचूर्णपाशपूर्णे ।

Caraka Samhitā, VI. xxv.

⁴ See P. 149-50.

⁵ वालाः, अश्वादीनां पृच्छभवकेशा वृक्षेशाश्च अर्शीं वाल्यादि वन्धनार्थं युज्यते ।

Vāgbhaṭṭartha Kaumudi, I. xxv.

⁶ Paulus Aegineta, VI. xviii.

Suśruta¹ says: "Bundles of hairs or tents are to be used in the treatment of wounds in the skull, formed by the extraction of an arrow from the brain. These would prevent the hernial protrusion of the cerebral substances from passing out through the wound. The hairs are to be removed one by one, as the wound heals up gradually." Vāgbhata² also approves this treatment.

A bundle of hairs tied to a long thread is mentioned by Suśruta to have been used for the extraction of fish-bones from the throat³. The patient is directed to swallow the ball of hairs with some liquid. Next emetics are to be administered to excite vomiting. During this act, the foreign body gets entangled in the meshes of the ball, which being then suddenly pulled out by the thread outside, extracts the fish-bone satisfactorily. Vāgbhata⁴ also describes it similarly. For this purpose

¹ शिरसोपहृते शख्ये वालवर्ति प्रवेशयेत् ।
वालवर्त्यामदत्तयां मस्तुलुङ्गः व्रशात् स्वेत् ॥

Suśruta Saṃhitā, IV. ii.

² कार्या शख्याहृते विञ्जे भङ्गाद्विदलिते क्रिया ।
शिरसोपहृते शख्ये वालवर्ति प्रवेशयेत् ॥
मस्तुलुङ्गस्तुते क्रुद्धो हन्यादिनं चलोऽन्यथा ।
व्रणे रीढ़ति चैकैकं श्वैरपनयेत् कर्चम् ।
मस्तुलुङ्गस्तुतौः खादेन्मासिकानन्यजीवजान् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, VI. xxvi.

³ अस्थिश्ल्यमन्यदा तिर्यक् कण्ठासक्तमवेच्च केशोरुकं दृढ़ैकं सूतवङ्गं द्रवभक्तीपहितं पथयेदाकण्ठाच्च पूर्णकोष्ठं वासवेद्ब्रह्मतश्च शख्ये कदेशसक्तं ज्ञात्वा सूतं सहसा लाचिपेत् ।

Suśruta Saṃhitā, I. xxvii.

⁴ कोशीन्दुकेन पौतेन द्रवैः कण्ठकमाचिपेत् ।
सहसा सूतवङ्गेन वस्त लेन चेतरत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

a tooth brush formed by chewing the end of a narrow branch of a tree is also recommended¹. A common domestic remedy is to make the patients swallow large morsels of boiled rice, plantain, etc.

Paul² mentions a similar contrivance, and says: "Some are of opinion that the patient ought to be made to swallow large morsels, such as stalk of lettuces or pieces of bread ; but others direct us to bind a thread about a small piece of clean soft sponge and give it to the patient to swallow, and then taking hold of the thread to draw it up, and to do this frequently in order that the thorn may get fixed in the sponge and be brought up". For this purpose Aetius used the epilation forceps. Paul calls it acanthobolus or the fish-bone forceps.

The modern surgeons use a probang for the same object. "Small sharp bodies, such as bristles, fish-bones, or pins, are generally found sticking between the pillars of the fauces and the tonsils." Such bodies "should not be pushed on, but an endeavour should be made to catch them with the "horse-hair probang." This being pushed gently, unexpanded, beyond the point where the pin or bone is stuck, is expanded by pulling up the handle and then withdrawn with a slight rotatory motion."³

Caraka⁴ mentions the practice amongst the recently delivered

¹ सूदुना वा दन्तधावनकुच्चकेनापहरेत् ।

Suśruta Saṃhitā, I. xxvii.

² Paulus Aegineta, VI. xxxi.

³ Swain's Surgical Emergencies, 3rd ed., Pp. 32-33.

⁴ अथास्या वालवेण्या कण्ठतालु परिमृशेत् ।

Caraka Saṃhitā, IV. xviii.

women to push a braid of her hair into her throat, to help the expulsion of the placenta. So in the Yogaratnākara¹, her throat is advised to be rubbed by a finger surrounded by hairs. This practice is still prevalent among the women of Bengal to a certain extent.

SUTURE MATERIAL.

Horse-hair was the material used by the Hindus for sutures. Besides it, they used² sutures of fine thread, or the fibres of the bark of Aśmantaka (*Cæsalpina digynia*), or threads made of hemp or flax, or of the fibres of which bow-strings were made, or of the fibres of the Mūrvvā (*Sansevieria zeylanica*) or Guḍūcī (*Tinspora cordifolia*). Besides these, the Hindu surgeons used the mouth parts of the ants as clasps to close incisions on the intestines. Suśruta³ describes the use of living black ants to close the incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the scyballi, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision,

¹ केशवेष्टिल्याङ्गुला तस्याः कण्ठं प्रघषयेत् ।

Yogaratnākara, P. 437.

² सौवेत् सूचोण सूतेण वल्केनाशमनकस्य वा ।

सनजचौमसूताभ्यां स्नायु वालिन वा पुनः ॥

मूर्वागुडुचीतानैर्वा ।

Suśruta Samhitā, I. xxv.

स्नायु सूतेण वल्कलैः ।

सौवेत्र दूरे नासने गटहात्तर्य न वा वह ॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxix.

³ परित्वाविष्णवेदमेव श्ल्यसुदृश्यावस्थावान् संशीघ्य तच्छिद्भन्नं समाधाय कण्ठ-पिपीलिकाभिर्देश्येत् दष्टे च तासां कोयानपहरिन्न सिरांसि ततः पूर्ववत् सौवेत् ।

Suśruta Samhitā, IV. xiv.

in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them. Caraka¹ also describes the use of ants for obliteration of small perforations in the intestines, but he takes away the ants before replacing the gut into the abdominal cavity. If by any accident, the abdominal muscles be incised and the intestines come out of a gaping wound, Suśruta recommends us to allow black ants to bite the exposed coils of intestines before replacing them into the abdomen². This is a curious practice of ancient surgery of the Hindus. The Greeks and Arabs never mentioned it. "Amongst some Indian tribes, it is customary to allow both edges of a wound to be seized by the sharp head-nippers of certain ants, whose bodies are then rapidly cut off; one ant after another being used, the wound is closed."³

Suśruta describes four sorts of sutures, *viz.*:

1. Vellitaka or winding.
2. Gophaṇikā or like a sling.
3. Tunna sevanī or continued sutures.
4. Rjugranthi or interrupted sutures.

¹ क्षिद्राण्णन्तस्य तु स्थूलैदेशयित्वा पिपीलिकैः ।

वहुशः संगट्हीतानि मत्वा क्षिल्वा पिपीलिकान् ।

प्रतियोगैः प्रवेश्यान्तं वह्वः सौव्येद त्रणं ततः ॥

Caraka Saṁhitā, VI. xviii.

² अभिन्नमन्तं निष्क्रान्तं प्रवेश्य नाम्यथा भवेत् ।

पिपीलिकाश्चरोगस्तः तदार्थे के बदलि तु ॥

प्रचाल्य पयसा दिग्धं दृष्टशोणित पांशुभिः ।

प्रवेश्येत् क्षत्तनखो घटेनाक्तं श्वैः श्वैः ॥

Suśruta Saṁhitā, IV. ii.

³ Neuburger's History of Medicine. Playfair's Translation, Vol. I., P. 9

These are advised to be so applied as they may suit the different parts of the body¹. The needles must not be introduced either too far from, or too close to the edges of the wound. In the former case, the lips of the wound shall be inflamed and so cause pain, while in the latter, the sutures will give way".

The use of horse-hair as a material for suturing wounds was unknown to the Greeks and Romans. They used sutures of flax and woollen threads for wounds. Paul says: "Afterwards we unite the seperated parts with a needle containing a woollen thread, being satisfied with two sutures."² Celsus³ advises us to use sutures of soft thread; and the apolinose of Hippocrates⁴ is directed to be made of crude flax.

17. AŚVAKĀTAKA. THE RING OF A HORSE'S BRIDLE.

Suśruta says that when the arrow is firmly fixed in the bone and if it can not be extracted by forcible pulling by hands or instruments, it should be tied to the ring of a horse's bridle. Then the animal is to be whipped, when by the sudden movement of the horse, the weapon would be jerked out of the wound⁵.

18. SĀKHĀ OR BRANCH OF A TREE.

Another method is to tie such an arrow by means of a rope

1

सौव्येहिन्नितकं शनैः ।

सौव्येहिन्नितकां वापि सौव्येहा तु त्रुमेवनीं ।

ऋग्यन्थिमयो वापि यथप्रयोगमयापि वा ॥

Suśruta Samhitā, I. xxv.

² Paulus Aegineta, VI. xii. Adam's Translations.³ Celsus, V. xxvi.⁴ Hippocrates, iii. 132.⁵ अश्ववृक्षकटके वा वभीयादथैनं कशया ताडीद्याधीन्नमयन् शिरोवैरीन शस्यसुङ्करति ।

Suśruta Samhitā, I. xxvii.

to the branch of a tree, lowered by pressure¹. When the pressure is released, the branch suddenly goes high up, and thereby it pulls the weapon out of the wound². Dallana, however, mentions another view that a bridle-ring and a branch of a tree are both required for the extraction of foreign bodies³. Hœrnle remarks : “The branch apparently is put through the ring to afford a stronger pull”⁴. Vāgbhaṭa⁵ also mentions these contrivances.

19. STHIVANA OR SPITTLE.

Dallana⁶ understands by it—“ throwing out expectoration and saliva by the mouth.” By this means any foreign body lodged in the oral cavity, such as in the gums, fauces, may easily be got rid of.

¹ दृढां वा हृचशाखामवनस्य तासां पूर्ववद्वद्वज्जीरेत् ।

Suśruta Saṃhitā, I. xxvii.

² शाखा, हृचशाखा, वह्नयास विनमितायां शाखायां शल्याग्रभागं दड़ं वज्ञा, सहसा शाखाल्यागेन उच्चितया शाखया शल्यसुप्रियते ।

Vāgbhaṭārtha Kaumudi, I. xxv.

³ अन्वे लेवं पठन्ति अशक्यमेवं वा वलवङ्गः सुपरिगृह्णितस्य यन्ते शोनं ग्राहयित्वा शल्यमावद्वं प्रविभूज्य धनुर्गुर्नैर्बद्धैकतःशाथाश्ववक्टकाटके वभीयात् । अथैनम् इत्यत्र कारकेकपाठः कश्या ताडयेत् यथोन्नमयन् शिरोवेगेन शल्यसुद्धेरति, नमितायां पच्चाङ्गां हृचशाखायां व पूर्ववद्वद्वज्जीरेदिति ॥

Nivandha Saṅgraha, I. xxvii.

* The Suśruta Saṃhitā. Bibliotheca Indica. P. 48. foot note 109.

⁵ तथाप्यशक्ये वारङ्गं वक्रीकृत्य धनुर्जय्या ।

सुवद्वं वक्रकटके वभीयात् सुसमाहितः ॥

सुसंयतस्य :पच्चाङ्गा बाजिनः कश्याथ तम् ।

ताडयेदिति सूर्जानं वेगेनोन्नमयन् यथा ॥

उद्धरेच्छल्यमेवं वा शाखायां कल्पयेत्तरोः ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

* छीवणं श्वी आदिनिरसनम् ।

Nivandha Saṅgraha, I. vii.

20. PROVĀHANA OR FLUXING THE PATIENT.

This comprises the acts of emesis, purgation and lacrymal secretion. Thus the foreign bodies lodged in the alimentary canal or eyes may be got rid of by causing discharges from the bowels, the stomach, or the eyes¹.

21. HARŚA OR OBJECTS EXCITING HAPPINESS.

Persons suffering from vrāṇa or wound are directed to have their minds in a state of cheerfulness by the sight of objects exciting happiness². A cheerful man is a better subject for a surgical operation than a morose and gloomy one. Vāgbhāṭa³ adds fear as an accessory instrument. Joy and fear cause a sudden change in the temper of a man and so may be of some help in curing diseases⁴. Suśruta regards, sorrow as a śalya or foreign body which is to be removed by joy.⁵

22. AYASĀKANTA OR LOAD-STONE.

Magnet was known to the ancient Hindus⁶ and they used it

¹ तदाशुच्वथूऽत्र कास मूत्र पूरीषानिलैः स्वभाववलप्रवृत्तै नयनादिभ्यः पतति ।
Suśruta Sāmhitā, I. xxvii.

² सुहृदो विचिपन्यागु कथाभिर्बणवेदनाः ।

आश्वासयन्तो वहशस्त्रनुकूलाः प्रियम्बदाः ॥

* * * *

सम्पदाद्यनुकूलाभिः कथाभिः प्रीतिनानसः ।

आश्वावान् व्याधिमोक्षाय चिप्रं सुखमवाक्षुयात् ॥

Suśruta Samhitā, I. xix.

³ See foot-note 1, P. 98.

⁴ भय हृषीं श्रीरस्य सहसा भावान्तरसुन्पादयन्ती यन्त्रकार्यं कुरुत इति ।

Vāgbhāṭārtha Kaumudī, I. xxv.

⁵ हृदयवस्थित मनेक कारणोत्पन्नं शोकशस्त्यं हृषेणेति ।

Suśruta Sāmhitā, I. xxvii.

⁶ मणिगमनं सूच्यमिसर्पणमद्दृष्टकारणकं ।

Vaiśeṣikā Darśanam, Ch. V, Āhnika 15.

to extract minute foreign bodies such as iron particles from the eyes and teeth. Suśruta¹ also mentions its use for extracting an arrow from the wound, if it be without barbs.

In modern times, a magnet is still used for removing a particle of iron from the eye. "Indeed, cases have occurred in which the application of an inch bar-magnet connected with four Grove's cells to the outside of the cornea has caused the foreign body to retrace its course and emerge through the wound"². A fragment of iron lying in the vitreous has been removed by the Snell's electro-magnet introduced through the scleral wound behind the ciliary region. "The following plan of ascertaining whether a portion of needle be really impacted has been suggested by Marshall, and successfully carried into practice by Littlewood of Leeds. A powerful magnet is to be held upon the part for a quarter of an hour, so as to magnetise the fragment; a firmly hung polarised needle should then be suspended over it, when, if any iron is present, deflection will ensue."³

23. KṢĀRA. CAUSTICS OR POTENTIAL CAUTERY.

Caustics were highly extolled by the ancient surgeons as the external applications are better tolerated by the weak and

सूचभिसर्पणमिति सूचीपदेन लौहभावं दण्डोपलक्षयति: तथा चायस्कान्ताभिसुखं
यत् सूचार्देगमनं * * * * * *

Sāṅkara Miśra, Upaskāra.

¹ अनुलोममनववइकर्णमनत्य ब्रणसुखमयस्कान्तेन ।

Suśruta Saṁhitā, I. xxvii.

² Carter's Ophthalmic Surgery, 2nd ed., P. 369.

³ Erichsen's Surgery, Vol. I, P. 343.

timid persons who are afraid of the surgeon's knife¹; though Suśruta² distinctly states: "The following persons should not be treated with caustics: weak people, children, old and timid people, etc." They even give them preference to the knife for they argue that surgical diseases are radically cured by the application of the caustics, without any possibility of recurrence. Suśruta says³: "Of all cutting instruments and their substitutes, caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions and scarifications may be made, derangements of the three humours may be rectified and some diseases can be treated with special advantage."⁴

For the preparation and uses of caustics, see the Suśruta Saṁhitā, I. xi.

For the application of potential cauteries, three classes of instruments are recommended.⁵

1. Darvvi—it is to be made of wood and should resemble a spoon in appearance.

¹ अत्यस्तेऽवले वाले पाके चातर्थं सुज्जते ।

दारणं मर्मं सम्यादिस्थिते चान्यत पाटनं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxix.

² अथनैते चारकात्याः । तद्यथा दुर्बलवाल स्थविर भीरुसर्वाङ्ग श्लोदरि रक्तपित्ति-गार्भिं वृत्तुमती प्रहृज्ज्वरि प्रमेहोरः चतुर्दशीनटष्णा मूर्च्छीपद्मतक्षीवापहसोदृच्छ फलयोनयः ॥

Suśruta Saṁhitā, I. xi.

³ शस्त्रानुशस्त्रेभ्यः चारः प्रधानतमच्छेदभियलिख्य करणाविदोषप्लवाद्विशेषक्रियावचारणात् ।

Suśruta Saṁhitā, I. xi.

⁴ Ibid. Hoernle's Trans. Bibliothica Indica.

⁵ आस्ताद्य च दर्ढीकूच्चैश्लाकानामन्यतमेन चारं पातयेत् ।

Suśruta Saṁhitā, IV. vi.

2. Śalākā or rods,—plain probes are mentioned for application of caustic lotions to parts of the body. But generally the ends of the probes are shaped like spoon. To this class belongs the three spoon-like probes of Suśruta and the three nail-shaped probes of Vāgbhāta, described before¹.

3. Kūrecca,—it is a brush-like instrument.

The application of caustics has its advantages and disadvantages ; and these are to be considered in their relations to the pre-anæsthetic periods of surgery. Patients are still less terrified by their application than by surgical incisions. The real value of caustics is thus summed up by Velpeau.² “Nevertheless caustics possess some advantages which can not be denied them. As they do not give the idea of an operation, they shake less the minds of the patients, they are accepted with more calmness and with infinitely less effort, than the action of the knife. Mortifying the tissues step by step, they give rise to no effusion of blood, and affect less deeply the economy than the operation, properly so called. Women treated in this way do not require to remain in bed or to consider themselves as patients. The dressings require little care, and do not demand absolutely the intervention of the surgeon. The wound cleans itself very rapidly in general, and once cleaned, it proceeds speedily towards cicatrisation. Without exempting wholly erysipelas, phlebitis or purulent infection as some surgeons have asserted, there is notwithstanding, some reason for supposing that they expose the patient somewhat less to these troublesome complications than the operation”.

¹ See P. 158-159.

² Velpeau. Cancer of the breast. Marsden's trans.

25. AGNI. ACTUAL CAUTERY.

Suśruta says¹: “With regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not re-appear, and because it can cure diseases which are incurable by medicines instruments, and caustics.”² This partiality for cauteries is one of the reasons of the gradual decadence of Hindu surgery and its total extinction in the present time. To this belief of the Hindus may be compared the following aphorism of Hippocrates³:—

“Those diseases which medicine do not cure, the knife cures ; those which iron can not cure, fire cures ; and those which fire can not cure, are to be reckoned wholly incurable”.

For the application of the actual cautery the following articles are considered necessary⁴ :—

- | | |
|---|--|
| 1. Pippali or piper longum
2. Goat's dung
3. Teeth of a cow
4. Šara or saccharum sara
5. Probes or śalākā (see before ⁵) | } These are to be used for diseases of the skin. |
|---|--|

¹ चारादिग्निरीयान् क्रियातु व्याख्यातस्तद्व्यधानां रोगानांमपुर्णभावाद्वेषजशस्त्रक्षारैरसाध्यानां तत्साध्यत्वाच् ।

Suśruta Samhitā, I. xii.

² Ibid. Hoernle's Trans. Biblio. Ind.

³ The Works of Hippocrates. Syd. Soc., vol. II., p. 774.

⁴ अथेमानि दहनोपकरणानि । तद्यथा पिप्पल्यजाशक्तज्ञोदन्त शरशलाका जान्मवौष्टे तरं लोहाः चौद्रगुड्जेहाश्च । तत्र पिप्पल्यजाशक्तज्ञोदन्त शरशलाकाल्पगृगतानां । जान्मवौष्टे तरं लोहानि मांसगतानां चौद्रगुड्जेहाः सिरक्षाय सन्ध्यस्थिगतानां ।

Suśruta Samhitā, I. xii.

⁵ See P. 159-60.

6. Jāmvavauṣṭha ¹	}	Used for diseases of the muscles.
7. Different kinds of iron		
8. Honey ²		
9. Treacle		
10. Ghee		
11. Oil		

"Both Aetius and Oribasius represent goat's dung, pounded with vinegar, as being equally efficacious as the sinapism, and applying particularly to ischiatic diseases."³ Hippocrates says that cauterisation may be performed with boxwood spindles dipped in boiling oil.⁴ In Kordofan, are used "*El kamaia*. primitive instruments used for cauterisation consisting of a piece of camel's or sheep's dung dried and impaled on a long thorn."⁵

12. Cautery knife.—This is to be used in the treatment of prolapse of the omentum in cases of abdominal injuries. The

¹ अशीं भग्नदरयथिनाङ्गीदुष्टव्रशादिषु ।

मांसदाहो मधुसेह नाम्बवीष्ट गुडादिभिः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxx.

² मधुक्षिण्ठन तैलेन भज्यते द्रवसाप्तते ।

तसैवा विविधैलौ हैदं हैदाह विशेषत् ॥

Caraka Saṁhitā, VI. xiii.

³ Adams' Commentary on Paul. vol. iii. bk. vii. sec. xix.

⁴ Hippocrates, ii. 482.

⁵ Medical Practices in Kordonfan, Third Report. Wellcome Research Laboratory, Khartoum.

prolapsed part is to be ligatured well and the cautery knife used to remove the prolapse below the ligature¹.

Cautery knife was also known to the Greeks and Romans. Galen², speaking of cancer, says that “some use heated razor blades, at once cutting and burning”. Paul³ also mentions a sword shaped cautery in the radical cure of hydrocele.

13. Plates of copper, lead or iron.—In the application of both kinds of cauteries, plates of these metals are to be used to surround a tumour to prevent injury to the adjacent structures (Suśruta).⁴

Hippocrates⁵ in the treatment of nasal polypus, says that “when that occurs we must insert a tube and cauterise with three or four irons”. Celsus⁶ says that this tube may be a calamus or a tube of pottery.

14. Cakradatta mentions a probe of gold for applying actual cautery to the hair follicles after the removal of the eyelashes, to prevent a recurrence of trichiasis.⁷

Albucasis similarly recommends burning the roots of hairs

¹ उदरान्मेदसी वर्ति निंगता यस्य देहिनः ।

कषायभयमृतकौर्णा वडा सुवेण सववित् ।

अग्नितपेन शस्त्रेणच्छन्दान्मधुसमायुतं ॥

Suśruta Saṃhitā, IV. ii.

² Galen, xiv. 786.

³ Paul, vi. lxii.

⁴ यदत्यमूलं वपुतामसीस पट्टः समावेष्ट्र तदायसैर्वा ।

चाराग्निशस्त्राण्य सक्रदविदध्यात् प्राणानहिंसन् भिषग्प्रमत्तः ॥

Suśruta Saṃhitā, IV. xiii.

⁵ Hippocrates, ii. 244.

⁶ Celsus, vii. x.

⁷ See foot-note 2, p. 66.

in trichiasis with a probe of gold. Paul¹ applies a heated olivary probe or an aural probe for the same purpose. Haly Abbas and Rhazes also describe this operation.

26. BHESAJA OR MEDICINES.

This means such medicines as become necessary in the treatment of surgical diseases and do the work of surgical instruments to a certain extent. Suśrata gives a list of medicines,² required in the treatment of various kinds of inflammations, and I quote a few passages from the English translation³ to illustrate the action of medicines in surgical practice. "Warm poultices made of the following drugs promote suppuration, namely, fruits of *sana* (*Crotalaria juncea*), *Mūlaka* (*Raphanus sativus*); *Śigru* (*Moringa pterygosperma*), sesamum and mustard seeds, flour of barley and wheat, *kinya* (the drugs used as a ferment in distilling spirits) and linseed. The following medicines are applied for opening abscesses, namely, *chiravilva* (*Pongamia glabra*), *agnika* (*Semicarpus anacardium*), *chitraka* (*Plumbago Zeylanica*), *danti* (*Baliopernum montanum*), *hayamāraka* (*Nerium odoratum*), and the excrement of the pigeon, vulture and heron. Caustic alkalies are also very effectual in opening abscesses. Demulcent articles, such as, flour of barley, wheat or *másha* (pulse of *Phaseolus Rux.*) promote discharge from the interior of abscesses. * * * * Pastils for fumigating ulcers should be made of *śrīveshtatka* gum of (*Boswellia Thurifera*), *sarjarasa* (resin of *Shorea robusta*), *sarala* (*Pinus longifolia*), and *deradáru* (*Cedrus*

¹ Paul viii. xiii.

² See Suśrata Saṁhitā, I. xxxvi.

³ Dr. U. C. Dutt's Translation, Bibliotheca Indiae. P. 151-154.

deodara); decoctions or cold infusions of astringent and unirritating barks should be used as washes for promoting granulations in ulcer. Tents for promoting granulations should be made of *soma* (*Sarcostemna brevistigma*), *amrita* (*Cocculus cordifolias*), *asvagandhá* (*Withania somnifera*), the plants included under the class of *kákolyádi*, and the buds of (*Ficus Bengalensis*)".

In treating inflammation, the Hindu surgeons used pastes to give relief to the pain and tension; warm poultices to promote suppuration; medicinal applications and incisions by knife for opening abscesses; demulcent articles to promote discharges; decoctions of drugs as corrective washes; tents of drugs and lint for introducing them into the cavities of the abscesses; decoctions in oils and clarified butter to improve the character of ulcers; pastils for fumigating sores; tents, pastes, powders and lotions for promoting granulations; drugs to repress high granulations; drainage to prevent infection, and bandages to give the part rest. This shows that the Hindus were not wholly ignorant of the autiseptic methods of treating wounds; and Suśruta enjoins that a certain incense should be kept burning in the operation room.

Of the additions to the list of Suśruta by Vāgbhaṭa, we need consider the goat's gut only.

GOAT'S GUT.

The intestines of the goats, etc. are to be dried and prepared as materials of ligature¹. They should be used in ligaturing fine vessels after incision by knife, evidently to check haemorrhage.

¹ See foot note 1, P. 223.

The use of goat's gut in surgery is generally considered to have been unknown to the Greeks and Romans, as it is not mentioned in their works. But Adams points out¹ "that the strings of ancient harp were made of the guts of a sheep," and this he clearly proves from a passage in the *Odyssey* of Homer.

Hippocrates² used apolinose made of crude flax, which is also mentioned by Paul for the delegation of arteries. Rhases however describes the use of strings of harp³ as a material for suture in the operation called *gastroraphé*.

ARREST OF HÆMORRHAGE.

It is generally believed and often stated in modern works on surgery that the ancients were unacquainted with the proper treatment of hæmorrhage. Suśruta however enumerates four different ways of arresting hæmorrhage after venesection; namely:

1. Sandhāna :—Contraction of the wound by astringent decoctions of Chebulic Myrobalan and the root-barks of the panchavalkala trees (five barks).
2. Skandana :—or thickening of the blood by the application of severe cold.
3. Pāchana :—or desiccating or drying up the wound by ashes.
4. Dahana :—or cauterising the veins to make them shrink⁴.

¹ See Commentary on Paul, VI. lii, vol. II, P. 345. Syd. Soc. Ed.

² Hippocrates, iii. 132.

³ Rhases. Cont. xxviii.

⁴ चतुर्लिंघं यदेतज्जि रघिरस्य निवारणं ।

सम्बानं स्तन्दनचैव पाचनं दहनं तथा ।

If the blood does not thicken by the application of cold, astringents should be applied; if these fail ashes should be used. By means of these three modes, the physician should endeavour to the best of his abilities to stop the bleeding, but if success be not still obtained, cautery may be resorted to as the absolute effective means¹. To stop bleeding from an artery, he advises us to apply astringents and pressure with the fingers. Vāgbhaṭa² also describes these methods of arresting haemorrhage, and advises us that if the ordinary means do not check the bleeding, the vessel must be again opened at a point in its course beyond the bleeding area, or actual cautery applied. Cakradatta also repeats these directions³.

Vāgbhaṭa however mentions the sheep's gut amongst the accessory instruments. His commentator explains its use for

ब्रणः कषायः सम्बते रक्तं स्कन्दयने हिमे ।

तथा सम्याचयेहस्त दाहः सज्जोचयेत् सिराः ॥

Susruta Saṁhitā, I. xiv.

¹ अस्त्रदमाने रुदिरे सम्बानाति प्रशोजयेत् ।

सम्बाने भृशमाने तु पाचने: समुपचारेत् ॥

कल्पैरेतेत्विभिर्वेद्यः प्रथनेत् यथाविधि ।

असिद्धिमत्सु चैतेषु दाहः परम् इष्टने ॥

Ibid.

² रक्ते त्वतिष्ठति चिप्रं सम्भनीमाचरेत् क्रियात् ।

लोभ्र प्रियहु पसङ्ग माषयस्याह गोरिकैः ॥

मृतकपालाङ्गनचौम सबौ चौरीत्वगङ्गरेः ।

विचूर्णयेद् ब्रणमुखं पद्मकाद्वि हिमं पिवेत् ॥

तामेव वा शिरां विच्छेदधात् तमादनन्तरं ।

शिरामुखं वा त्वरितं दहेत् तपश्चलाक्षया ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

¹ See Cakradatta, Sirāvyādhādhikāra.

ligaturing blood-vessels¹. Suśrata says that if in vescsection, or in treating wounds, excessive bleeding occurs, it should be stopped by proper means².

Celsus³ advises us to fill up the wound with dry pledgets, then to apply a sponge squeezed out of cold water and to press with the hand. If not successful, cut the vessel asunder between two ligatures, or apply cautery, or try the method of revulsion. Galen⁴ applies pressure by finger on the wounded vessel, or twists it moderately. If the vessel be an artery, he gives the alternative of a ligature or cutting across. Paul⁵ mentions all the methods to stop the bleeding, *viz.*, pressure, styptics, ligature, escharstics, and cauteries with fire.

Albucasis⁶ mentions four methods of stopping the discharge of blood from an artery :

1. By cautery.
2. By dividing the artery across.
3. By using the ligature.
4. By styptics and bandage.

Avicenna⁷, Rhases⁸ and others also mention these methods

¹ अत्वं निषादीनां गुच्छान् तां इत्यस्यातं शस्त्रदेहानन्तरं सूक्ष्मसिरादिवन्धनादिरुपुज्जते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

² तैखेद्विभिन्नैर्वहुधा शोनिते प्रसुते भवते ।

कार्यं यथोक्तं वैयेन शोनितस्थापनं भवेत् ॥

Suśruta Saṃhitā, IV. i.

³ Celsus, v. 26.

⁴ Galen. Meth. Med. v.

⁵ Paulus Aegineta, IV. lii. vol. II. P. 127. Syd. Soc. Ed.

⁶ Albucasis. Chirrug. i. 58.

⁷ Avicennæ Cantic. ii. 2., and Collig. vii. 23.

⁸ Rhases. Divis i. 39; Contin. xxviii.

for arresting haemorrhage. Thus it becomes apparent that the use of ligature for stopping bleeding was well known to the ancient surgeons and the present methods of arresting bleeding are only the revival of the old practice. Adams¹ concludes : "It appears, therefore, that the use of the ligature for stopping hemorrhages was well understood by the ancients, and had never been lost sight of even in the darkest ages."

¹ Adam's Commentary on Paul, vol. II. p. 132.

CHAPTER VI.

THE ŚASTRA OR THE SHARP INSTRUMENTS.

1. THE MĀNDALĀGRA OR ROUND HEADED KNIFE.

It is described as a round or circular headed cutting instrument, having a length of six anguli. Two sub-varieties are noted —one with a circular edge and the other shaped like a razor (*Dallana*).¹ Vāgbhaṭa², however, describes the blade to be shaped like the index finger when its nail points towards the palm of the hand. This would then resemble the decapitating hook of Ramsbotham.

It is said to have been principally used for the operation of cutting through and scraping³; so it is recommended to be used

¹ मण्डलमिवाग्य यस्य तत् मण्डलाग्यं तच्च द्विविधम् तथाहि—

यदगे मण्डलं छत्रं चुर संस्थानमेव वा।

मण्डलाग्यस्य जानीयात् प्रमाणन्तु षडङ्गुलम्।

Nivandha Saṅgraha, viii.

² मण्डलाग्यं फले तेषां तर्जन्यन्तर्खाकृतिः।

लेखने क्षेदने योज्यं पोथकी शुखिकरदिषु॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

मण्डलाग्यं, मण्डलाग्यं नाम शस्त्रं, फले, फल प्रदेशे, तर्जन्यन्तर्खाकृतिः स्तात्, अन्तः, अन्तर्हितो नखः, अन्तर्खः, तर्जन्या अन्तर्खः: तर्जन्यन्तर्खः, तस्येवाकृतिः राकारी यस्य तत् तर्जन्यन्तर्खाकृतिः। तच्च पोथकी गलशुखिकादिषु, लेखने, लेखन कर्मणि, तथा क्षेदने, क्षेदन कर्मणि, योज्यः।

Vāgbhaṭārtha Kaumudī, I. xxvi.

फलोद्देशे तर्जन्या अन्तर्खस्तर्जन्यन्तर्खस्तस्येवाकृतिर्यस्य तदेवम्।

Sarvāṅga Sundari, I. xxvi.

³ तत्र मण्डलाग्यकरपवे स्यातां क्षेदने लेखने च।

Suśruta Saṁhitā, I. viii.

in the operative treatment of enlarged tonsil¹. It is also advised to be used for piercing the skull of a dead foetus in utero to help its easy extraction by other instruments. So any other presenting part causing difficulty in the delivery of the dead foetus, is to be cut with it. It is claimed that there is less likelihood of damaging the soft parts of the mother by this instrument than by the sharp pointed vrddhipatra.²

We find that Suśruta recommends a maṇḍalāgra knife in ophthalmic practice for scraping away the membranous expansion in the operation of pterygium³ and other ophthalmic operations,

¹ अङ्गुष्ठाङ्गुलिसन्दशेनाकृत्य गलशुचिकां ।

क्षेदयेन्मण्डलाग्रे ण जिह्वोपरि तु संस्थिताम् ।

नोतक्षाटच्चेव हीनच्च विभागं क्षेदयेन्धिषक् ॥

Suśruta Saṁhitā, IV. xxii.

² तत्र स्त्रियमाश्वासय मण्डलाग्रे णाङ्गुली शस्त्रेण वा शिरो विदार्थं शिरःकपालान्ताहृत्य शङ्खुना गटहृलोरसि कचार्या व्यपहरेदभिन्नेशिरसि चाक्षिफूटे गण्डे वा अससंसक्तस्थांसदेशे वाङ् छिला द्विभिवाततं वातपूर्णेद्वरं वा विदार्थं निरस्यान्ताणि शिथिलीभूत माइरेज्जघनसक्तस्थ वा जघनकपालानीति ।

यद्य, यदङ्ग् हि गर्भस्य तस्य स्वजति तद्विषक् ।

सुम्यग्निर्हरेच्छिला रचेन्द्रारैच्च यबतः ।

गर्भस्य गतयश्चिवा जायन्तेऽनिलकोपतः ।

तत्रानाल्पमतिर्व्वयो वर्त्तेत विधिपूर्वकं ॥

नोपेचेत वृत्तं गर्भं मूहुर्त्तं मपि परिष्ठितः ।

सञ्चाशु जननौं हन्ति निरच्छासं पश्च यथा ॥

मण्डलाग्रे ण कर्त्तव्यं क्षेदयमन्तर्विजानता ।

बृद्धिप्रव' हि तौचाय' नारौं हिंसात् कदाचन ।

Ibid, IV. xv.

³ अर्थं यथ वलीजातं तवै तल्लगयेद् भिषक् ॥

अपाङ्गः प्रेच्चमाणस्य वडिशेन समाहितः ।

मुचुण्डाग्राम्यच्च मेधावी सूचीसूतेण वा पुनः ॥

नचोत्थापयता चिप्र' कार्यमन्तु ब्रतं तु तत् ।

such as for vascular net-work and nodules on the eyeball¹. Cakradatta says² that if the pterygium extends to the black part of the eye, the membrane is to be raised by the point of a needle, transfixed by a vāḍīśa or hook, and leaving the pupil free, is to be excised, as Sivadāsa³ explains, by the mandalāgra. He also uses it to scrape away the root of any new growth in the eye⁴ and to perform the operation of scratching in ophthalmic surgery⁵.

शस्त्रपातभयाच्चासर वत्तम नौ याहयेद् दृढ़' ॥
 ततः प्रशिथिलौभूतं विभिरेव विलक्षितं ।
 उल्लिखनमरुडलायेणः तीक्ष्णे न परिशोधयेत् ॥
 विमुक्तं सर्वतश्चापि क्षणाच्छुक्षाच्च मरुडलात् ।
 नीला कनीनकोपात्तं क्षिन्यान्नाति कनीनकं ॥
 चतुर्भागस्थिते मांसे नात्ति व्यपत्तिसर्वतः ।

Sūruta Samhitā, VI. xv.

- ¹ सिराजाले सिराधात्तु कठिनाक्षाश्च द्रुविमान् ।
 उल्लिखनमरुडलायेण वडिशेनावलक्षितः ॥
 सिरासु पिङ्काजाता या न सिध्यन्ति भेषजैः ।
 अर्म्मवन्मरुडलायेण तासाल्केदनभिष्ठते ॥

Ibid.

- ² अर्म्म तु ल्लेदनीयं स्यात् क्षणप्राप्तं भवेद्यदा ।
 वडिशविष्वसुन्नम्य विभागच्चाव वर्जयेत् ॥

Cakradatta, Netraroga Cikitsā.

- ³ अर्म्मक्षेदनीयमिति मरुडलायेणेति शेषः । ससुन्नम्येति सूचयेणेति शेषः । सूचयेण समुद्रम्य उत्तोल्य अनन्तरं वडिशेन विज्ञा मरुडलायेण क्षेदयेदित्यर्थः ।

Tattva Candrikā, Netraroga Cikitsā.

- ⁴ अर्गस्तथावर्म्मनाना शुष्काश्चैर्बृह्दमेव च ।
 मरुडलायेण तीक्ष्णे च मूलेच्छिन्द्याद् भिषक् शैषैः ॥

Cakradatta, Netraroga Cikitsā.

- ⁵ भिलोपनाहं कफजं पिप्पली मधुसैन्धवैः ।
 विलिखनमरुडलायेण प्रक्षयेद्दा समन्ततः ॥

* * * *

A small instrument with a broad blade and a rounded cutting tip is figured by Albucasis¹ in connection with ophthalmic work. This was the scalpel for the plastic operation on the eyelid as for trichiasis. Incisions were made by this knife on the eyelids in such a way as to enclose a leaf-shaped area which was then dissected off. The lips of the incisions were then united with three or four sutures². Paul³, quoting Aetius⁴, describes the operation for pterygia :—" Having separated the eyelids, and seized upon the pterygia with a hook-like instrument, having a small curvature, we stretch it, and taking a needle having a horse-hair and a strong flaxen thread in its ear (eye ?), and a little bent at the extremity, we transfix it through the middle of the pterygium, and with the thread we bind the pterygium and raise it upwards, while with the hair we separate and saw as it were the part at the pupil away unto its extremity ; but the remainder of it at the great canthus we cut off from the base with the scalpel used for the operation by suture, but leaving the natural flesh of the canthus, lest there be a running of the eye when it is taken away. Some stretching as aforesaid with a thread, dissect away the whole pterygium with the instrument called pterygotomos, taking care not to touch the corner."

Cakradatta mentions the use of the *mandalāgra* for scarifying

घृतसैन्धव चूर्णं कफानाहुं पुनः पुनः ।

विलिखिनमण्डलायेण प्रच्छयेदा समन्तः ॥

Cakradatta, *Netraroga Cikitsā*.

¹ Milne. Græco-Roman Surgical Instruments, Pl. ix. fig. 3.

² Paulus Aegineta, VI. viii.

³ Ibid, VI. xviii.

⁴ Aetius, II. iii. 60.

the tongue for bleeding in the disease called *jihvākantaka* (prickly tongue)¹. He also uses it in *adhijihvā* or *ranula* and says: “The tongue is to be raised, the ranula is to be drawn up and fixed by a sharp hook, and then excised by the *mandalāgra*. Afterwards a strong gargle is to be prescribed”.² *Pālakāpya*³ also describes it to have a length of nine *aṅguli*, the handle being six, and the blade three *aṅguli* long. The end is full-moon-shaped and it is directed to be used for scarification on the eyeball.

It seems that *mandalāgra* of different sizes and shapes were used. For the instrument used for perforating the foetal cranium in uterus would scarcely be thought fit for a delicate operation on the eyeball.

Soranus⁴ mentions a special instrument for perforating the foetal head. Rhases⁵ directs us to open the head when the child's cranium is large and cannot be brought down. Haly

¹ करण्केषु कफोत्तेषु लिखितेष्वसूजः चये ।

पिप्पल्यादिर्मधुयुतः कार्यन्त प्रतिसारणम् ॥

Cakradatta, *Jihvāroga Cikitsā*.

लिखितेष्विति मरुलागादिना ।

Tattva Candrikā, *Ibid.*

² उन्नाय जिह्वामाक्षय वडिशेनाधिजिह्विकाम् ।

क्षेदयेनमरुलागेण तीक्ष्णोर्णैर्वशादिभिः ॥

Cakradatta, *Mukharoga Cikitsā*.

³ सेखनं मरुलाप्रेण कर्त्तव्यं दन्तिनां भवेत् ।

Pālakāpya, III. i.

पूर्णचन्द्राक्षत्याघमरुलागम् सेखनार्थमक्षो ।

Pālakāpya, III. iii.

* * Soranus, II. viii., P. 366.

⁵ Rhases, Cont. xxii.

Abbas¹ also advises us to open the head when it is preternaturally large. Aetius² also gives a similar discription. Some authors recommend the polypus-scalpel or the phlebotome in embryotomy. The embryotome figured by Albucasis³ is a straight two-edged blade, and we may conjecture that the maṇḍalāgra used by the Hindus for perforating the foetal cranium was a similar instrument.

2. KARAPATRA OR SAW.

It literally means, "an instrument having the blade in the form of a hand", the fingers being represented by the teeth of the saw. Others explain, as Dallana⁴ points out, the name from its resemblance to a carpenter's saw. It seems that saws of various sizes were used. Suśruta mentions its length to be six aṅguli, Vāgbhaṭa⁵ describes it to be ten aṅguli

¹ Haly Abbas, Pract. ix. 57.

² Aetius, XVI. 23.

³ Graeco-Roman Surgical Instruments, Pl. viii. fig. 7.

* करपवमिति करवत् पव' करपव' यथा करोऽङ्गुलिभिराचितो भवति तदत् यत् कण्ठकैराचितं स्थान्त् करपवसूच्यते। अन्ये तु करपवशस्तं करपवाकारभेदं तच्च द्वादशाङ्गुलं तन्वान्तर वचनात्। ननु यदि तन्वान्तरात्तद द्वादशाङ्गुलं करपवसूच्यते तर्हि स्तन्त्रे विरोधः कुतः स्तन्त्रे करपवस्य निर्दिष्टप्रमाणत्वात् शेषानि तु षडङ्गुलानि इत्यनेन वाक्येन षडङ्गुलभेदं करपवम् स्थान्न द्वादशाङ्गुलं नैवम् तेषाम् नामाभिरेवाकातयः प्रायेण व्याखाता इत्यच्छात् सूवात् प्रायः शब्दोऽनुवर्त्ततेतेनायमर्थं, शेषानि प्रायेण षडङ्गुलानि एवं शस्त्रमानेऽन्यचायविरोधः।

Nivandha Samgraha, I. viii.

५ क्लेदिष्ट्यां करपवन्तु खरधारं दशाङ्गुलं।

विस्तारे द्वाङ्गुलं सूक्ष्मदन्तं स्तन्त्रसरं वन्धनं ॥

Aṣṭāṅgā Hṛdaya Saṁhitā, I. xxvi.

करपवाख्यां शास्त्रमाह क्लेदे इत्यादि करवत् पव यस्य तत् करपवं, अङ्गुलिभिराचितो यथाकारो भवति तदत् यत् कण्ठकैराचित् तत् करपवसूच्यते। करपवं करात् ख्यात्। करपव' खरधारं, खरा, तौक्ष्या, धारा यस्य तत्त्वाविधम्, तथा दशाङ्गुलम्,

long and two aṅguli broad; while Bhoja¹ alludes to a saw, twelve aṅguli long. The edge of the instrument is described as rough and serrated; and this is the only instrument that need not have a very sharp edge.

The handle of the saw should be well formed and pegged. Its principal use is to saw a bone. Sometime it is recommended for the purpose of scraping.

Saw is frequently mentioned by the Greek and Roman authors in the descriptions of operations on the bones. Celsus² mentions it in describing the amputation of a gangrenous limb. With reference to fractures of the bones of the head, Paul says³: “But the mode of operating with saws and the instrument called chœnicides or modioli (trepans?) is condemned by the moderns as a bad one.” Evidently he means flat cranial saws. Galen⁴ also mentions the “knife-shaped saws.”

In modern times the saw is still used for identical purposes in surgery.

There is no mention of trephine in Hindu surgery though Jīvaka (500 B.C.) is said to have practised cranial surgery with success⁵. Pandit Vallala describes⁶, in his Bhojaprabandha or

दैर्घ्येन दशाङ्गुलं परिमाणं, तथा विलारे ह्यङ्गुलं, परिसरे अङ्गुलव्यपरिमितं तथा सूक्ष्म दलं सूक्ष्मा दलाकारा दलं यस्य तत्त्वाविधं, तथा खत्सरवत्वं, तसरु खड़्गादि सुष्ठिः वत्वनं, कौलादिना वत्वनं, तसरु वत्वनञ्च ते तसरु वत्वने, शोभने तसरु वत्वने यस्य तत्त्वाविधं । तत्र अस्थां क्षेदि, क्षेदन कर्मनि योज्यं ।

Vāgbhaṭārtha Kaumudi, I. xxvi.

¹ See foot-note 4, P. 230.

² Celsus, VII. xxxiii.

³ Paul, VI. xc.

⁴ Galen, XVIII. 331.

⁵ See Mahāvāgga, VIII. I.I8. Sacred Books of the East. Vol. xvii.

⁶ See foot-note 1, p. 60.

Anecdotes of King Bhoja, a surgical operation performed on the king. He was suffering from a severe pain in the head. Medicines did him no good, and so to give relief, surgical interference was thought necessary by two brother surgeons who happened to arrive in Dhar at that time. They are said to have administered a drug called sammohinī to render him insensible. They then trepanned the skull and removed the real cause of his complaint. They closed the opening, stitched the wound and applied a healing balm. They are then said to have administered to the king another drug called sañjibhanī to accelerate the return of consciousness.

Trephine was well known to the ancient Greeks and Romans. Hippocrates¹ mentions a trephine or a saw having a circular motion, in the treatment of injuries to the head. Paul also mentions trephine, the use of which is, he says, condemned by the moderns. Sprengel² remarks, that "Galen was averse to the use of the trepan, though he performed the operation on the head occasionally."³

3. Vṛddhipatra.

This sharp cutting instrument is called vṛddhipatra from its resemblance to the leaf of a medicinal plant called vṛddhi. Two varieties of this knife are described by Vāghhaṭa⁴—one is

¹ Hippocrates, III, 371, 374.

² Hist. de la Méd., 18.

³ Adam's Commentary on Paul, VI, xc. Vol. ii., p. 436.

⁴ बृह्षिपतं चुराकारं क्षेद भेदन पाटने ।

कृञ्जग्रसुखते शोफ गम्भीरे तु तदन्यथा ।

नताय' पृष्ठतो दीर्घं ऋस्वक्तं यथायथ' ॥

straight throughout and it is to be used for opening pointed superficial abscesses; and the other has the end bent or curved. Again amongst the second class of curved knives, some have their ends long and therefore called dīrgha-vaktra or long-mouthed, and these are to be used for opening the deep seated abscesses, while others have their ends short and therefore called hrasva-vaktra or short-mouthed, and these are to be used for superficial abscesses that would not point. Suśruta describes them to be six aṅguli long. Dallana in his commentary¹ says:— Both the varieties, one with a curved,—and this is called a kṣura or razor,—and the other with a resected point, should be seven aṅguli long; the handles and the blades should measure five and a half and one and a half aṅguli respectively.” These are to be used for cutting through a part, partially or completely, and also for puncturing it.

बृहिपदार्थां शस्त्रमाह बृहिपवमित्यादि बृहिपत्रं नाम शस्त्रं, चुराकारं, चुराक्षति, चुरश्च लोमच्छेदकः शस्त्रविशेषो नरसुन्दराणां। तत्र बृहिनामौषधं बृच्छय पवसदृशं फक्तवात् बृहिपदार्थं लभते। तद् बृहिपत्रं नाम शस्त्रं क्षेदे मेदने पाटने च कर्वयिति योज्यमिति चृञ्जयमित्यादिना विषय विशेषे बृहि पवसाकारं मेदं उच्यते। यत् बृहिपत्रं चृञ्जयं सरलाग्रभागं, आग्रताग्रमित्यर्थः। तत्, उद्भवते, उच्चिते, शोके, शोथे, योज्यं। गम्भीरे, मेद आदि धातुरथे शोके, तथा तदन्यथा, अनुन्नते च शोफे, यत् पृष्ठतः, पृष्ठदेशे नताय वक्त्रीभूताग्रभागं, कुच्छिताग्रमित्यर्थः। तत् बृहिपत्रं शस्त्रं यथायथं दीर्घं झस्त्रं वक्त्रं, दीर्घं सुखं, झस्त्रं सुखं वा योज्यं। यथायथमिति गम्भीरे शोके दीर्घवक्त्रं, अनुन्नते च शोफे झस्त्रवक्त्रमित्यर्थः। अत दिविधं बृहिपत्रं शस्त्रयुक्तम्, हे अपि सप्ताङ्गुलं प्रमाणे, इयोरपि अङ्गपञ्चाङ्गुलं उन्तं कार्यं साईङ्गुलवैयं फलमिति। मेदनं, मेदं, एकचिन् शारीरदेशे शस्त्रमावगाञ्च अपर दिशा शस्त्रायस्य निष्काशनं मेदनं। पाटनं, विदारणं फाडन इति लोके।

Vāgbhaṭārtha Kaumudi, I. xxvi.

¹ बृहिपवमिति, हृष्टेः पञ्चमिव बृहिपत्रं तत्र हिविधं एकं अच्छिताग्रं, द्वितीयं प्रयतापाय, द्वे अपि सप्ताङ्गुलं प्रमाणे इयोरपि अङ्गं पञ्चाङ्गुलं उन्तं कार्यं साईङ्गुलम् फलम् इति अनयोर्भव्ये अच्छिताग्रं बृहिपत्रं चुरमाहः।

Nivandha Saṃgraha, I. viii.

One form of the vṛddhipatra resembles in shape the razor used by the barbers,—not the English razor that has now become common in Bengal, but the country-made razors which are still used by the barbers in the North-West Provinces.

Suśruta recommends the use of razor, scissors and pinchers for shaving the parts before operation; for “the hairs”, he says, “prevent the healing up of the wound rapidly”¹. He again uses vṛddhipatra as a knife and observes:—“If bitten by spiders whose bites are amenable to treatment, the area of the wound should at once be excised out by the vṛddhipatra, and then actual cautery applied by the red-hot jāmvavauṣṭha probe till the patient requests for its withdrawal”².

Suśruta uses the vṛddhipatra knife for the removal of the scrotal tumour and says³: “The scrotal tumour is to be well fomented and bandaged. The patient should then be cheered up, and leaving the testicles intact, underneath the median raphe, the tumour should be excised by vṛddhipatra knife. The fatty tissues being

¹ रोमाकौर्णीं ब्रशो यस्तु न सम्यगुपरोद्दति ।
चूरकर्त्तरीसन्दृष्टै स्वस्तरोभाष्णि निर्वरेत् ॥

Suśruta Samhitā, IV. i.

² साध्याभिराभिलुताभिर्दृष्टमावस्य देहिनः ।
ब्रह्मिपवेण मतिमान् सम्यगादंशसुद्धरेत् ॥
आम्बषेनाग्नि तपेन दहेदाकर वारणात् ।

Ibid, V. viii.

³ सिद्रां चावेष्य पट्टेन समाशास्रातु मानवं ।
रचेत् फले सेवनीच्च ब्रह्मिपवेण दारथेत् ॥
मेदक्षतः समुद्धृत्य दद्यात् कासीससेन्धवे ।
बज्जौयाच यथोद्दिष्टं ।

Ibid, IV. xix

removed, powdered ferri sulphur and rock salt are to be dusted over the wound and proper bandages applied."

Vṛddhipatra was also used by the ancient veterinary surgeons. Joyadatta Suri writes¹: "The knife known as vṛddhipatra is shaped like a kṣura or razor. It is three aṅguli long and should be used by the wise to incise a suppurated abscess". In Pālakāpya², we find that "it is ten aṅguli long; the handle being six aṅguli and the blade four aṅguli long and three aṅguli broad. It is used for scission and excision". He uses it also in opening a sinus after well ascertaining its course by means of a probe³.

Hypodermic medication:—The use of hypodermic syringe was not known to the Hindus. They were acquainted however with the hypodermic method of exhibition of drugs. Śāringadhara⁴

¹ व्रज्जुलं डिपत्तच्च चूरकारं प्रकौर्तितम् ।
पक्षशोथादिषु प्राज्ञः पाटनं तेन कारयेत् ॥

Aśvavaidyaka, XIV. v. 22.

² शस्त्रेण डिपत्वे य वाऽसि(शि)तेन सि(शि)तेन वा ।
शस्त्रकर्मणि निच्यातः सुपक्षं पाठर्यद्विषक ॥

Pālakāpya, III. iv.

डिपत्वे य नागानां कुर्याच्छेदनं भेदने ।

Pālakāpya, III. i.

³ अथ भिषग्यन्वाधायोक्तेन विधिना सुयन्त्रितं वारणमभिविश्वास्याऽऽश्य(शि)त्य स्तम्भानुगतं गतिमन्तं स्वत्यसुखं नाडीवृणमेषण्या च विदित्वा डिपत्वे य शस्त्रेणानुलोमं पूयप्रतिरक्षार्थ-क्षेदं कुर्यात् ॥

Pālakāpya, III. xv.

⁴ प्रकृष्य वा चुरेणाङ्गं केवलानिलपीडितम् ।
तव प्रदेहं दद्याच्च पिट् गुञ्जाकलैः क्षतम् ॥
तेनाववाहुजा पौड़ा विपचौ ग्रधसौ तथा ॥
अन्यापि वातजायीडा प्रश्नम् याति विगतः ॥

Śāringadhara Saṅgraha, III. xi.

directs us to scarify a part with a razor and then apply an ointment of *guñjā* (*Abrus precatorius*) in sciatica, scrofulous glands of the neck, etc. For treating a person in the state of unconsciousness caused by the derangement of all the humours, he directs us to scarify the anterior fontanelle with a razor, then to apply as much medicine as can be carried on the point of a needle to the part and rub it with fingers¹. The medicine is to be prepared thus :—take aconite 1 pala, quicksilver 1 śāma ; mix, and put inside two sorābas or earthen basins smeared with powdered glass and placed face to face. Apply some external application over this and put it on fire for six hours. Then open the basins, take the soot collected on the upper basin and deposit it in a glass vessel quickly to prevent exposure. Caraka² also advises us to apply a medicinal paste on a cranial incision, shaped like

¹ विषं पलमितं सूतः शाण्यिकश्चर्यं येद्द्वयम् ।
तच्चूणं सम्पृष्टे च क्लेवा काञ्जितसरावयोः ॥
मुद्रां दत्त्वा च संशोष्य ततश्चूलां निवेशयेत् ।
वङ्गिं शनैः शनैः कुर्यात् प्रहरद्वय मंख्यथा ॥
तत उत्पाद्य तन्मुद्रामुपरिष्ये सरावके ।
संलग्नो यो भवेद्गूमः तं गट्ठीयाच्छनैः शनैः ॥
वायुस्यर्थैः यथा नसगात् ततः कुप्यां निवेशयेत् ।
रसः सूचीमुखेलग्रस्तुप्या निर्याति भेषजम् ॥
तावन्नादो रसी देयो मूर्च्छिने सन्निपातिनि ।
चुरेण प्रक्रिने मूडिं तदङ्गुल्या च चर्षयेत् ॥
रक्त भेषज सम्पर्कान्मुर्च्छितोऽपि हि जीवति ।
तथैव सर्पदंष्टस्तु चतावस्थोऽपि जीवति ।
यदातापो भवेत् तस्मा मधुरं तत्र दीयते ॥

Sāringadhara Saṅgraha, II. xii.

² विषदृष्टित कफमार्गः स्रोतसंरोधरुद्धवायुश ।
स्रोतद्वय श्वसेन्मर्त्यः सारादसाध्यलिङ्गैरिहीनश ॥

the foot of a crow, in case of snake-bite when he becomes unconscious but his life is not completely despaired of.

4. NAKHA ŚASTRA OR NAIL PARER.

Sūśruta¹ mentions its length to be eight aṅguli. Dallāṅga² says that its blade is two aṅguli long and one aṅguli broad. Vāgbhaṭa³, on the other hand, describes the length to be nine aṅguli. Arunadatta⁴ thinks it to be a double instrument, one end having a straight edge and the other an oblique one. Some explain⁵ that two different kinds of nakha śastra—one with a straight and the other with an oblique edge—are directed to be used.

चर्मकषायाः कल्पं विलसमं मूर्दि काकपदमस्त्रः ।

त्रिला कुर्यात् कटभौं कटुकोटफला प्रधमनन्त्रः ॥

Caraka Saṁhitā, VI. xxv.

¹ तद नखशस्त्रैषणावष्टाङ्गुले सूचीवद्यन्ते ।

Sūśruta Saṁhitā, I. viii.

² नखशस्त्रमिति नखानां क्षेदनाय शस्त्रं नखशस्त्रं तस्य फलं द्वाङ्गुलायामम् एकाङ्गुलं विसृतम् ।

Nivandha Saṅgraha, I. viii.

³ वक्रजुधारं द्विसुखं नखशस्त्रं नवाङ्गुलं ।

सूचाश्ल्योङ्गुतिच्छे देवेद प्रच्छान लेखने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

⁴ नखशस्त्रं नखच्छेदकं प्रसिद्धं । तच्च वक्रा क्षजूशधारा यस्य तदेवम् । तस्येकं सुखं वक्रमन्यद्वन्न स्पष्टम् ।

Sarvāṅgasundarī, I. xxvi.

⁵ नखशस्त्रमाह वक्रजुधारमित्यादि नखानां क्षेदनाय शस्त्रं नखशस्त्रं तत् द्विसुखं द्वि द्विः प्रकारं सुखं यस्य तद्विसुखं तथा वक्रजुधारै एकं वक्रं धारं अपरम् क्षजूशधारं सात्, तथा नवाङ्गुलं उभयोमपि दैव्येण नवाङ्गुलपरिमितं तच्च नखशस्त्रं श्ल्योङ्गुत्यादौ योज्यं श्ल्यानां करण्टकदीनामुड्यति रुद्धरणं श्ल्योङ्गुतिः प्रच्छानं चेरा इति यस्य प्रसिद्धिः लेखनं चाँचन् इति लोके ।

Vāgbhaṭārtha Kaumudi, I. xxvi.

They are principally recommended for cutting, puncturing and scarifying¹; and also for the extraction of needles and minute foreign bodies from the soft parts.

There is no mention of a many-bladed scarificator in the surgical books of the Hindus, but its office was performed by the nakha śastra, in wet cupping, by making parallel incisions close to one another.

Paul² alludes to an instrument compounded of three blades joined in such a way that at one stroke, three scarifications were made; but he prefers a single scalpel for the purpose.

Pālakāpya mentions an instrument called rampaka³, having the handle ten aṅguli and the blade three aṅguli long. It is to be used for paring the nails and cleaning the feet of the elephants.

5. MUDRIKĀ.

It is described to be a cutting instrument of the size of the last phalanx of the index finger⁴; it is also called aṅguli-śastra or finger-knife. Vāgbhaṭa describes this instrument but not clearly. He says that the mouth of the aṅguli-śastra looks as if coming out of a ring, and the blade is half an aṅguli wide. A ring, having the size sufficient to admit the terminal phalanx of the index

¹ वृद्धिपत्र नखशस्त्र सुद्रिकोपलपचकाहूँ धारानि क्षेदने भेदने ।

Suśruta Saṁhitā, I. viii.

² Paulus Aegineta, VI. xli.

³ रम्पकस्त्राङ्गुलसुखो दशाङ्गुलहस्त पादशोधनार्थं नखक्षेदनार्थं चेति ।

Pālakāpya, III, xxx.

⁴ प्रदेशित्यगपर्वप्रदेशप्रभाणासुद्रिका ।

Suśruta Saṁhitā, I. viii.

finger, should be soldered to it. The base of the instrument has a thread tied to it¹.

It is recommended to be used for cutting through neoplasms in the throat. In its uses, Vāgbhāṭa says that it resembles the mandalāgra and vṛddidhipatra; and so was sometimes required for perforating the skull of a dead fœtus in the uterus of its mother².

Dr. Simpson of St. Andrews (1744) is said to have invented an instrument, a “ring scalpel” for opening the skull. It consists of a loop of steel, through which the finger is to be passed

¹ कुर्यादहुलिशस्तकं ।

सुद्रिकानिर्गतमुखं फलेवङ्गाङ्गुलायतं ।
योगतो हृद्धिपवेण मण्डलाये ण वा समं ।
तत्प्रदेशिन्यय पञ्चप्रभाणार्पण सुद्रिकम् ।
सूववज्ज्ञ गलस्तोतो रोगछेदन भेदने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुर्यादित्यादिना अङ्गुलिशस्तकं व्यक्ति । सुद्रिका अङ्गुरीयकेण निर्गतं निष्क्रान्तं सुखं यस्य तत्तथाविधं सुद्रिकानिर्गतमुखं तथा फले फलोद्देशे अङ्गुलायतं अङ्गुलामाच विसार अङ्गुलिशस्तकं अङ्गुलिनाम शस्त्रं कुर्यात् । तच्च योगतः प्रयोगे हृद्धिपवेण मण्डलायेण वा समतुल्यं भवति । लेखने छेदने हृद्धिपववत् योज्यं किञ्चा छेदन भेदन पाटने मण्डलायवत् योज्यमित्यर्थः । तदित्यादि तदङ्गुलि शस्त्रकं प्रदेशिन्यय पञ्चप्रभाणार्पण सुद्रिकं कुर्यादिति योज्यं । बैद्यस्य प्रदेशिनी नामौ अङ्गुलि ससारा अग्नं यत् पञ्च तत्तथा तस्य यत् प्रभाणं परिभाणं तदर्पणा तत् प्रवेशोपयुक्ता सुद्रिका यस्य तत्तथाविधं । सुद्रिका सुदरी आडटी इति वा ख्याता । तथा सूववज्ज्ञं मूलदेशे सूक्ष्मेषवज्ज्ञं तच्च गलस्तोतो गतानां रोगाणां छेदने भेदने च योज्यं ।

Vāgbhāṭārtha Kaumudī, I. xxvi.

* विकाशौ नाम तौ सूद्री शस्त्रदारणमहंतः ।

मण्डलाङ्गुलि शस्त्राभ्यां तवकर्म्म प्रशस्तते ।

हृद्धिपवं हि तीच्छायं न योनाववचारयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, II. ii.

and from which protrudes a sharp pointed blade about an inch long, by which the cranium was pierced¹.

In the pseudo-Hippocratic treatise² a knife to fix on the thumb and dismember a foetus in utero is mentioned. This knife is called by Turtullian³ the “ring knife”, whereby the limbs are advised to be cut off in the womb. It is interesting to point out that mudrikā also means a ring.

The veterinary surgeons still use a scalpel blade mounted on a ring⁴, through which a forefinger is passed to dismember foals and calves in exactly the same way.

6. UTPALAPATRA.

This knife is described to have the shape of a petal of the blue lotus. The end is long, sharp and pointed. The utpalapatra is dirgha-vaktra or long bladed, while the arddhadhāra is the hrasva-vaktra or short bladed knife⁵. It is to be used for cutting through and puncturing the parts.

¹ Ed. Med. Essays, vol. V, Part I, P. 445.

² Hippocrates, I. 463.

³ De Anima, 26.

⁴ Græco-Roman Surgical Instruments, Pl. vii. fig. 1.

६ दीर्घं ङ्रस्ववक्रं यथायथं ।

उत्पलाध्वंधाराख्ये भेदने क्षेदने तथा ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

उत्पलपत्राख्याध्वंधाराख्ये शस्त्रे आह उत्पलत्वादि उत्पलच्च अध्वंधारच्च ते आख्ये ययोः शस्त्रयोः स्ते उत्पलाध्वंधं धाराख्ये शस्त्रे तथा, यथाक्रमं दीर्घं ङ्रस्व वक्रे भवतः । तत्र उत्पलाख्यं दीर्घवक्रं, अध्वंधाराख्यं ङ्रस्ववक्रमिलर्थः । उत्पलशब्देन उत्पलपत्राख्यं शस्त्रं गम्यते तन्नान्तरदर्शनात् । तस्य फलस्य उत्पलपत्रकारत्वादुत्पलपत्रमिति संज्ञितम् । अधिकमर्जं धारा यस्य तत्र अध्वंधारं । उन्नफलयोर्मध्ये फलसिंव्र किञ्चिदधिक दैर्घ्यमिति वर्तते । तच्च अष्टाङ्गुलायतं उरसि अङ्गुलं विस्तारं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

In the Aśvavaidyaka, the utpalapatra and vrihipatra knives are recommended to be used in puncturing the veins in phlebotomy¹. “The surgeon who is practically acquainted with the methods of puncturing the veins, should use the utpalapatra and vrihipatra knives for the purpose.”

When used for puncturing the large veins the knife is recommended to be encircled with thread at a short distance from the end to prevent unnecessary injury to the vessels by plunging the the knife deeply².

Hippocrates similarly “guards his phlebotome in the surgical treatment of empyema, by having it wound round with a rag, leaving the breadth of the thumb nail at the point.”³

Both the utpalapatra and vrihimukha knives are thus described in the Aśvavaidyaka⁴: The “vrihimukha knife should be six aṅguli long and half an aṅguli wide. The utpalapatra should also be similarly made.”

The utpalapatra knife is recommended to be used for incising

¹ शस्त्रेणैतपलपदेण ब्रीहिपदेण वा भिषक् ।

शिरावेधविधिैं सम्यग् दृष्टकर्मा प्रयोजयेत् ॥

Aśvavaidyaka, XIV. v. 23.

² सूतकेण च संवेद्य सुखुं शस्त्रस्य दुष्क्रिमान् ।

यथाप्रमाणं संस्थाप्य ततो विद्वावयेत् शिराम् ॥

Ibid, XV. v. 35.

³ Hippocrates, II. 258 Kuhn's Ed. and I. 88 Syd. Soc. Ed.

⁴ अर्द्धाङ्गुलन्तु विस्तीर्णे कूर्यच्छस्त्रं षड्ङुलम् ।

नामा ब्रीहिसुखुं मध्यक् तथा चोत्पलपवकम् ॥

Aśvavaidyaka, XIV. v. 21.

the abdominal parietis of the horse; then a tube is to be pushed through the wound in the operation of paracentesis abdominis¹.

The phlebotome used by the Greeks is nowhere described in their books; but from considerations of all the various operations to which the instrument was put bears out the fact of its being a sharp pointed, double-edged and straight lancet. The phlebotome of the Greeks might have then resembled in shape the utpalapatra of the Hindus. It was used by the Greeks for various operations besides phlebotomy, as for the opening of abscesses such as the parulis or gum boil², puncture of cavities containing fluid as in opening the abdomen for ascites³, incising the tunica vaginalis as in excision of hydrocele sac⁴ and for dissecting out warts⁵ and sebaceous cysts⁶.

It is interesting to note that Pālakāpya⁷ mentions utpalapatra and describes it to be eight aṅguli long, one and a half aṅguli broad and double edged. He uses it for puncturing vessels etc.

¹ हृदयसप्ताधरे भागे जड्बागे च नाभितः ।

अधोवा नाभितः कूर्यच्छेदनं चतुरङ्गुले ॥

शस्त्रेणोत्पलपत्रेण वामभागे विचक्षणः ।

एकमेवाङ्गुलं शस्त्रं कुचौचापि प्रवैश्येत् ॥

बेधन्तये ततस्तम्भिन् नालिकां वस्त्रवेष्टिताम् ।

प्रक्षिप्य गालयेद्वारि यावद्वैकोष्ठलाघवम् ॥

Aśvavaidyaka, LII. vs. 25, 26 and 27.

² Paul, VI. xxvii.

³ Ibid, VI. L.

⁴ Ibid, VI. lxiii.

⁵ Ibid, VI. lxxxviii.

⁶ Ibid, VI. xiv.

⁷ ब्रौह्मिसुखप्रमाणसुत्पलपत्रं भेदनाथं ।

7. ARDDHADHĀRA.

It is difficult to ascertain the exact shape of this knife. Some translate it as a “single edged knife,”¹ but it really means, as Dallana explains, an instrument which has a sharp edge for half the length². It is also called cakradhāra. Vāgbhaṭa has a variant reading—adhyārddhadhāra—which means an instrument having a sharp edge for more than half the length³.

It is eight aṅguli long; the blade is two aṅguli long and one aṅguli wide, and the handle six aṅguli long. It is to be used for incision and division of parts of the body.

8. SŪCĪ OR NEEDLES.

Three needles are recommended to be used for applying sutures. They should be strongly made and rounded in shape. At one end they are flattened, grooved and pierced with an eye for the suture. The groove is said to have been intended to be the bed of the suture during stitching to prevent it from doing any harm to the tissue. In fleshy parts such as the thighs, a three ribbed needle, three aṅguli long, is advised to be used. For less fleshy parts and wounds about the joints, a similar straight needle but two aṅguli long should be employed, while for suturing the wounds of the stomach, intestines, scrotum and the vital parts of the body, preference is given to a needle curved like a bow, two and a half aṅguli long and having the pointed end

¹ Hœrnle's Translations of Suśruta Saṁhitā, Bibl. Ind. I. viii.

² अर्द्धधारमिति, अर्द्धे धारा यसा तत् अर्द्धधारः, चक्रधारमिति प्रसिद्धं तत्त्वं अष्टाङ्गुलायत् उरसि अश्युलं विस्तारं द्वाराङ्गुलं लंफलं। अन्ये लघुर्द्धधारमिति पठन्ति, अधिकमर्द्धं धारायस्य तत् अच्युर्द्धधारम्।

Nivandha Saṅgraha, I. viii.

³ See foot-note 5, P. 240.

shaped like a paddy. In thickness, these needles are described to be equal to the stalk of the flower of mālatī (*Jasminum grandiflorum*). They should have sharp fine points and good shape¹. The needles are also recommended to be used for extraction of foreign bodies from the soft structures and also for evacuating abscesses².

¹ देशीत्यमांसे सम्भौ च सूची ब्रह्माङ्गुलहर्यं ।
आयता व्राङ्गुला चक्षा मांसले वापि पृजिता ॥
धनुर्वक्त्रा हिता मर्मफलकोषोदरोपरि ।
इत्येतास्त्रिविधाः सूचीसीत्याग्राः सुसमाहिताः ।
कारयेन्मालातीपुष्पहन्तागपरिमङ्गलाः ॥

Suśruta Saṁhitā, I. xxv.

ब्रह्मागृह दृढः पाशे चिक्षः सूचोऽच सौवने ॥
मांसलानां प्रदेशानां व्रास्ता चरङ्गुलमायता ।
अत्यमांसास्थि संस्थिस्य ब्रणानां ड्राङ्गुलायता ।
ब्रीहिवक्त्रा धनुर्वक्त्रा पक्षामाशयमर्मसु ।
सा साईङ्गुल सर्वा ब्रह्मास्त्रावतुरङ्गुला ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

तिस्तुणां सूचीनां विषयविशेषे आकारभेदानाह मांसलानामित्यादि ‘मांसलानां’ ऊर्ज्वा-दीनां शरीर प्रदेशानां सौवनाये सूची, ‘व्रास्ता’ चिकीषविशिष्टा तथा चरङ्गुलमायता, अङ्गुलचयदीर्घा कर्त्तव्या, असग्गास्त्रास्त्रत्वं मयभागसैव न तु सर्वावयवस्त्रा । सूचाः सर्वा-बग्रवस्त्रं हि साधारणातो व्रता कारत्वनिहशादितिगम्य । असग्गा अपि गृह दृढः पाशत्वं सामान्योक्त्या कथितमेव अत्यमांसलस्थानं संस्थितानां, संस्थास्थि संस्थितानांच्च ब्रणानां सौवने ड्राङ्गुलायता, अङ्गुलिद्वय दीर्घा, सूचीकर्त्तव्या, पक्षाशये, आमाशये तथा ‘मर्मसु’ वस्त्रादिषु संस्थितानां ब्रणानां सौवने, ब्रीहि वक्त्रा, पाटलादि ब्रीहिवन्मुखा, ‘धनुर्वक्त्रा’ धनुर्वद्वक्त्राकारा या सूची साईङ्गुला, अङ्गुलाधिक ड्राङ्गुल द्वीर्घा योज्येति योज्यं अत्रापि गृह दृढः पाशत्वं योजनीयं । साईङ्गुलेत्यन्तेन च्छेदः । सर्वेत्यादि परेण सम्बन्धते ॥

Vāgbhaṭārtha Kaumudi, I. xxvi.

* सूचीकुशपदाटीमुखशरारीमुखालमुखचिकूचकानि विश्वावणे ।

Suśruta Saṁhitā, I. viii.

In modern times, the surgeons use fully curved, half-curved and straight surgical needles. Waring¹ remarks : "The shape of the needle which ought to be used for closing an incision depends upon the depth and accessibility of the wound. In deep wounds, or wounds which are not readily accessible, curved needles will be found to be most useful, while for shallow cuts straight needles will be most convenient."

Suśruta makes mention of a javamukhī needle² (*lit.* having the sharp end shaped like a barley corn) for passing a double ligature smeared with escharotic ointment, across the base of a tumour in opposite directions. Then by cutting through the nooses, and tying together the contiguous ends of the ligatures, the whole of the growth is encircled and strangled by them, exactly in the same way as in modern times a nævus is ligatured by means of a nævus needle. Cakradatta also quotes this description of the method of extirpating tumours by ligatures.

Erichsen says³ : "When the tumour is small, an ordinary double ligature may be passed across its base, by means of a common suture needle ; and the noose being cut and the thread tied on each side, strangulation will be effected. When it is of larger size, and of round shape, the most convenient method is that recommended by Liston. It consists in passing, by means

¹ Manual of Operative Surgery. By H. J. Waring, M.S., M.B., Third edition, P. 42.

² अर्जुदादिषु चोत्किंप्य मूले सूतं निधापयेत् ।
सूचीभिर्यववक्त्राभिराचित् वा समन्ततः ।
मूले सूतेन वधीयाच्छन्ने चोपचरिद्व्रणम् ॥

Suśruta Saṃhitā, IV. xvii.

Cakradatta, Naḍīvraṇacikitsā,

³ Erichsen's Surgery, Vol. II, P. 73.

of long nævus needles, fixed in wooden handles, and having their eyes near their points, double whipecord ligatures in opposite directions beneath the tumour ; then cutting through the nooses, and tying together the contiguous ends of the ligatures until the whole of the growth is encircled and strangled by them."

There are many instances of the use of surgical needle by the Greek and Roman Surgeons. Needles of different sizes are recommended. Celsus mentions a large needle in describing the operation of suturing the abdominal parietis¹, and another, evidently a small needle, which is said to have been used in the treatment of staphyloma of the cornea². The needles were either round or three-cornered. "A few three-cornered needles of Roman origin have been found, although they are rare" (Milue³). Paul uses a needle in suture of the upper eyelid, and other modes of operating for trichiasis⁴, for the repair of wounds of the peritoneum⁵, and recommends a large sized needle containing a double thread to close the peritoneum in the operation for enterocele⁶.

Pālakāpya mentions sūcī or needles for stitching wounds⁷. They are eight anguli long, shaped like the tusk of an elephant and are either three ribbed, or four ribbed, or round, smooth and

¹ Celsns, VIII, xvi.

² Ibid, VII. vii.

³ Græco-Roman Surgical Instruments, P. 75.

⁴ Paulus Ἀγνείτα, VI. viii.

⁵ Ibid, VI. lii.

⁶ Ibid, VI. lxv.

⁷ सूची सेवनार्थै । अटाङ्गुलं नागदन्ताहृति । चाक्षा चतुरक्षा वा दृढ़ा समाहिता यथा शलाका वजे वस्त्रविश्वर्थम् ।

strong. He reserves curved three-cornered needles for fleshy parts and round needles for skin, veins, nerves and arteries¹.

Caraka recommends the use of leeches, knife and needles for extracting blood from the piles². He also advises us to use needles for pricking the patches of leprous spots³ before the application of leeches for extracting blood.

9. KUŚAPATRA.

It is a form of knife resembling in shape the leaf of a kuśa grass (*Poa cynosuroides*)⁴. The instrument should be six aṅguli long (Suśruta); the blade measuring two aṅguli (Vāgbhaṭa)⁵

¹ याः सूच्यस्त्रिविधाः प्रोक्ताः शस्त्राध्याये संस्थिताः ।

नागदन्ताङ्गतिर्ष्टा विकोणा चेति निश्चयात् ॥

अस्याग्नितः नागदन्तया मांसजं च त्रिकोणया ।

त्वकस्त्राय धमनीरथं च शिराजं चैव हत्या ।

आहार्य सर्वयन्त्राणां सूच्या सीवनभिष्ठते ॥

Pālakāpya, III. i.

² जलौकोभिः तथा शस्त्रैः सूचीभिर्वा पुनः पुनः ।

अवर्तमानं रुधिरं रक्ताश्चेभ्यः प्रवाहयेत् ॥

Caraka Saṁhitā, VI. ix.

³ प्रच्छितमत्यं कुष्ठं विरेचयेदा जलौकाभिः ।

Ibid, VI. vii.

⁴ कुशपत्रमिति, कुशपत्रतुल्यं कुशपत्रं तन्मानमाह :—

अङ्गुलैरुचकं विद्यादङ्गुलं फलमुच्यते ।

डन्तं सात् वाङ्गुलं मध्ये कुशपत्रस्य लचणम् ॥

Nivandha Saṁgraha, I. viii.

⁵ कुशटी वदने शाव्ये इङ्गुलं स्त्रात्योः फलं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुशटीवदने द्वे शस्त्रे, शाव्ये विश्वावण विषये योज्ये । तयोः कुशटी वदनयोः
फलं इङ्गुलं, अङ्गुलदयं परिनितं सात् ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

and the handle four aṅguli, but according to Bhoja, the handle is three aṅguli long. It is to be used for draining pus from abscess. The handle has a ring like ornamentation, about one aṅguli in diameter. Another variant reading describes the blade, the ring, and the handle to have the lengths of two, three, and two aṅguli respectively. This would make the total length of the instrument to be seven aṅguli; so evidently there is some lapsus calami in the second reading.

Cakradatta uses kuśapatra as a bleeding lancet and says¹: “Out of the twelve vessels that lie on the sides and underneath the tongue, select the two large bluish vessels on either sides of the tongue, raise them up by vadīṣa or hook and puncture them by the kuśapatra knife and then, after bleeding, apply a paste of treacle and ginger to the wound”. In the Yogaratnākara², the author advises us to adopt this method of bleeding, in the treatment of tumours in the neck.

Pālakāpya mentions kuśapatra and describes it as being shaped like a kuśa grass³. It is nine aṅguli long—the handle being

¹ जिह्वाधाः पार्श्वतोऽधस्तां शिरा हादश कौर्चिताः ।
तासां स्थूलशिरे क्षणे विध्यात् ते तु शनैः शनैः ॥
वडिशेषव संगट्य कुशपत्रेण बुद्धिमान् ॥

Cakradatta, Galaganda Cikitsā.

² जिह्वाधः पार्श्वयोर्भूलाच्छिरा हादश कौर्चिताः ।
तासां स्थूले शिरे वे च क्षिण्ड्यात्ते च शनैः शनैः ।
वडिशेषव संगट्य कुशपत्रेण बुद्धिमान् ।
सुते रक्ते ब्रणे तच्चिन् दद्यातस गुड्माद्रकम् ॥

Yogaratnākara, P. 321.

³ नवाङ्गुलं कुशपत्रं । पच्चाङ्गुलं डत्तं । चतुरङ्गुलम् पत्रं । अध्याधीङ्गुलविलृत-
सुभयतो धारं । कुशपत्राक्ति गच्छौरपाकभेदनार्थं षडङ्गुलं हत्तम् अध्याधीङ्गुलं पत्रं ।

Pālakāpya, III. xxx.

five or six aṅguli and the blade four aṅguli long. The blade is one and a half aṅguli wide and is sharp-edged on both sides (*i.e.*, double-edged). It is used for incising deep abscesses.

10. ĀTĪMUKHA.

This instrument is described to have the shape like the beak of the jalavardhani bird or āṭī¹ (*Turdus ginginiamus*),—a bird living in the marshes. It is six aṅguli long; the blade measuring two and the handle four aṅguli. So it is of the same size as the kuśapatra to which it also resembles in function. Bhoja is of opinion that its blade is one and the handle seven aṅguli long...

11. ŚARĀRIMUKHA.

This instrument is a pair of scissors resembling the face of the long beaked bird called śarārī. Dallana describes two varieties of the bird, one with white shoulders, and the other with a red head. It is the former kind which is referred to here². Suśrūta describes its length to be ten aṅguli³, while Dallana mentions the length to be twelve aṅguli.

¹ आटीमुखमिति, आटी जलवैद्यनौ नाम पच्चिविशेषः तस्मुखवमुखं यस्य तत् आटीमुखं तथाचोक्तं :—

ब्रह्मं सप्ताङ्गुलं विद्यात् तस्याये फलभिष्ठते ।

आटीमुखं प्रकारं हि फलमङ्गुष्ठमायतम् ।

Nivandha Samgraha, I. viii.

² शरारीमुखमिति, दीर्घचक्षुः पच्चिविशेषः स हिविधः ध्वलस्कन्धः रक्तशीर्षश्च ध्वलस्कन्धस्य शरारीति संज्ञा तस्मुखवमुखं तस्य शस्त्रस्य लोके कर्तृरीति संज्ञा ताच्च दादशाङ्गुलां चलन्पलासां कुर्यात् ।

Ibid.

³ दशाङ्गुला शरारीमुखी सा कर्तृरीति कथ्यते ।

Suśrūta Saṁhitā, I. viii.

It is recommended to be used for evacuating abscess¹, etc. Suśruta mentions karttarī as a synonym but Vāgbhaṭa counts it as a separate instrument. He describes karttarī as a pair of scissors used by the barbers for clipping hair and is said to have been necessary for dividing the nerves, ligaments and fine hairs².

12. ANTARMUKHA.

Suśruta describes another variety of scissors, used principally for evacuating abscesses. It is so named, for its straight cutting edges are within its curved claws³. It is said to be six aṅguli long and one and a half aṅguli broad⁴. It seems that the curvature of the blade varied widely; and Vāgbhaṭa describes a variety called

¹ स्नाये शरार्थास्त्रविकूर्चिके ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

स्नावे विद्वावनविषये कर्मणि शरार्थास्ता विकूर्चिके वे शस्ते योज्यः । तत्र शरार्थास्त् शरारीमुखं शरारी दीर्घचक्षुः पञ्चविशेषः तस्य सुखवदास्यं यस्य तत् शरार्थास्त्, तत्र चलत् फलं दशाङ्गुलं दीर्घं कार्यं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² स्नायु सूक्ष्म कच्छेदे कर्त्तरी कर्त्तरीनिभा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कर्त्तरीश्वरमाह स्नायुत्यादि कर्त्तरीनामश्वस्त् कर्त्तरौसहशं तत्र स्नायुक्षेदने सूक्ष्मकेश-
क्षेदने च योज्यं । कर्त्तरी काटारी इति यस्य प्रसिद्धिः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ अन्तर्मुखमिति मध्यमुखं तल्लचणमाह—

अष्टाङ्गुलप्रमाणेन जिह्वापरिण चाप्रतम् ।

शस्त्रमन्तर्मुखं नाम चन्द्राङ्गं इव चोद्धतं ।

Nivandha Saṁgraha, I. viii.

⁴ तददन्तर्मुखं तस्य फलमध्यर्ष्मङ्गुलं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

arḍhacandrānan¹ or “half-moon faced” scissors in which the blades are curved like the half-moon. It has the length of eight aṅguli, the blade measuring one and a half aṅguli. This is also to be used for letting out pus from abscesses.

Hārīta, however, mentions a śastra, called also arḍhacandra or half-moon, but he recommends its use for excising the prolapsed arms of a dead foetus to effect its delivery². This instrument can not but be a knife, for it seems difficult to cut off the arm, even of a foetus, with a pair of scissors. Moreover, antarmukha has never been credited with the power of excising the arm.

13. TRIKŪROCCAKA.

It has been translated in English as a thin-edged sharp instrument or trocar. Wise, Dutt and Hoernle agree to mean by it a trocar. But it can be better explained if we understand by the term an instrument consisting of three needles fixed on a round

अपरञ्च विश्वावण शस्त्रमाह तद्दिल्यादि तदृत् कुशाटीवदनवत्, अन्तर्मुखं अन्तर्मुखं' नाम
शस्त्रं स्थाये योज्यं तस्य अन्तर्मुखस्फलं अध्यईमङ्गुलं स्यात् । आधि अधिकं अर्जुं अध्यद्वं ।
सार्वेषकमङ्गुलमित्यर्थः ।

Vāgbhātartha Kaumūdī, I. xxvi.

¹ अर्जुं चन्द्राननं चैत तथाध्याङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अन्तर्मुखस्य प्रकारभेदमाह अर्जुचन्द्राननमित्यादि एतत् अन्तर्मुखं, अर्जुचन्द्राननं अर्जु-
चन्द्राकारमुखच्च भवति, तदपि तदृत्, कुशाटीवदनवत् स्थाये योज्यं । तच्च फले अर्जुङ्गुलं
अर्जुङ्गुलपरिमाणं फलमित्यर्थः । अर्जुचन्द्राकारमुखत्वात् अस्य शस्त्रसापि अर्जुचन्द्राननमिति
संज्ञेति वीर्यं ।

Vāgbhātartha Kaumūdī, I. xxvi.

² अथवार्जुचन्द्रेण शस्त्रे षैव स्तरगर्भस्य वाहयुगर्ल सञ्जिद्य वाहनिःसारयेत् ।

Hārīta Saṁhitā, III, II.

wooden handle¹. According to Suśruta, the length of the instrument is six aṅguli. But others describe it as eight aṅguli long; the blade and the handle measuring three and five aṅguli respectively². The distance between the edges is the breadth of a grain of rice. The end of the handle is ornamented with a circular metallic plate as a ring.

It is recommended to be used for evacuating abscesses and for draining blood from the nasal polypus.

Caraka³ mentions an instrument called kūrcca and says:— “After fomenting and thus softening the rounded nodules (of leprosy) which are fixed and hard, by heated stones and fumigations through tubes, they are to be injured by the kūrcca and the blood that oozes out, should be wiped away.”

Two other instruments are described by Vāgbhaṭa as being constructed on a similar principle. One is named kūrcca and the

¹ चिकूर्चकमिति वयः कूर्चा यस्य तत् विकूर्चकम् । कूर्चः कूर्ची इति लोके ।
Vāgbhaṭārtha Kaumūdī, I. xxvi.

² विकूर्चकमिति चयः कूर्चा यस्य तत् विकूर्चकम् तच तन्वान्तरम् :—

अङ्गुलानि तथाष्टौ च शस्त्रं कार्यं चिकूर्चकं ।
फलेरन्मुखाकारैवङ्गुलैरन्वितं विभिः ।
एकोकस्य फलश्वेषामन्तरं ब्रीहिसम्मितम् ।
इन्द्रं पञ्चाङ्गुलायाम् कार्यं रुचकमूषितम् ॥

Nivandha Saṃgraha, I. viii.

³ स्थिरकठिनमण्डलानां स्थिनानां प्रस्तरप्रणाडीभिः ।
कूर्चेर्विंघटितानां रक्तोत्क्लेशोऽपनेतव्यः ॥

Caraka Saṃhitā, VI. vii.

other, khaja. The kūrcca¹, he describes as an instrument "consisting of seven or eight rounded sharp needles, four aṅguli long, nicely bound together by a cord and tightly fixed on a circular wooden handle." He mentions its use in the operation of scratching to cure baldness and the brown and black spots on the face. For scarifying a bald spot, Cakradatta² uses needles, rough leaves, etc. "The khaja³," Vāgbhaṭa continues, "consists of eight rounded needles having the sharp ends half an aṅguli long. It is to be introduced

¹ कूर्चाहत्तैकं पीठस्थाः सप्ताष्टौ वा सुवस्थनाः।

संयोज्य नीलिका व्यङ्गं केशं शातिषु कुट्टने॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

सम्भवति कूर्चाख्यं शस्त्रं लच्छितुमाह सर्वेत्यादि ताः सूच्यः सर्वेऽव डत्ताः वर्तुलाः तथा चतुरङ्गुलाः चतुरङ्गुलदीर्घाः कूचः इत्युच्यते। ताः सूच्यः पुनः कौटिशः? डत्तेकपीठेशः; डत्ते वर्तुले एकमिन् पृष्ठे संस्थिताः, एकं डत्ताकारं काषफलकं परिवेश्य स्थिता इत्यर्थः। तथा सप्तसंख्यका अष्टसंख्यका वा, तथा शेभनं रञ्जुदिक्तं वस्थनं धासां तास्तथाविधाः सुवस्थनाः। स कूर्चः नीलिकादिषु रोगेषु कुट्टनार्थं संयोज्यः प्रयोज्य इत्यर्थः। कुट्टनं आँच्छान इति लोके। नीलिकादयो वत्यमाणा केशशातः केशानां पतनं।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² अवगाढपदचैव पुच्छयित्वा पुनः पुनः।

Cakradatta, Kṣudraroga Cikitsā.

अवगाढपदभिति गम्भीरपदं यथास्थात् तथाः सूचीनखरङ्गन्यादिभिः पुच्छयित्वा * * *

Tattva Candrikā, ibid.

³ अर्द्धाङ्गुलमुखैर्भृत्तेरटाभिः करणकैः खजः।

पाणिभ्यां मथमाणेन प्राणात्तेन हरिदस्तक॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

खजसंज्ञकशस्त्रमाह अर्द्धाङ्गुलमुखैरित्यादि अर्द्धाङ्गुलप्रमाणं सुखं येषां ते अर्द्धाङ्गुलमुखा स्त्रैवर्द्धाङ्गुलमुखैः डत्तैः वर्तुलैः अटाभिः अष्टसंख्यकैः करणकैः छाते शस्त्रं खजं उच्यते। तेन खजाल्लेन शस्त्रेन पाणिभ्यां हस्ताभ्यां मथमाणेन आलोड्यमाणेन प्राणात् नासिकाया अष्टकूरकां हरेत्, निर्हरेदित्यर्थः।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

into the nostrils and turned to and fro with both hands to bleed the nasal polypi."

The Greeks and Romans used a similar instrument for identical purpose. It was called katiádiou, measuring a blade of grass, and was used for opening abscesses of the womb and tonsils, drawing blood from the inside of the nose and perforating the foetal cranium.

In India, the practice of drawing blood from the nasal polypus by blades of grass is still in vogue; and Aræteus mentions it as a common mode of scarification in ancient Greece also¹. "On the next day we are to abstract blood from the inside of the nostrils, and for this purpose push into them the long instrument named Katiádion, or the one named Toryne, or in want of these we must take the thick quill of a goose, and having scraped the nervous part of it into teeth like a saw, we are to push it down the nostrils as far as the ethmoid cells, then shake it with both hands, so that the part may be scarified by its teeth. Thus we shall have a ready and copious flow of blood ; for slender veins terminate there and the parts are soft and easily cut. The common people have many modes of scarification, by rougher herbs and dried leaves of the bay, which they introduce with the fingers and move strongly." Paul² opens the vessels in the nostrils with the reed called typha.

14. KUTHĀRIKĀ.

It is a small instrument shaped like an axe, so called from its resemblance to kuthāra, an axe which is still used in India

¹ Extant works of Aræteus, P. 460.

² Paul, vol. II. Sec. ix.

for cutting wood¹. Vāgbhaṭa says² that “the base of the blade is thicker and broader than the end and is fitted to a handle, seven and a half aṅguli long. The blade which is shaped like the tooth of a cow, has the width of one aṅguli.” Bhoja describes the width of the blade to be a half aṅguli³. It is recommended to be used for puncturing vessels in the following manner⁴:—“Hold the handle with the left hand and put the blade on the vessel resting on a bone. Raise the instrument a little upwards and then strike over the thick base of the blade with the downward strokes of the middle or index finger, when let go

¹ For figure of Kuṭhāra as used in Ancient India, see Pl. xxii in Ferguson's Tree and Serpent Worship.

² पृथुः कुठारी गोदन्सटशार्द्धाङ्गुलानना ।

तयोर्द्वयं दण्डया विष्येदुपर्यस्थूं सिरां स्थितां ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुठारिका संज्ञकं शस्त्रमाह पृथुरित्यादि कुठारी पृथुः स्थात् । कुठारिका नामशस्त्रं पृथुः स्थूलसूलं स्थादिवर्यः । तथा गोदन्सटशार्द्धाङ्गुलानना गवां दन्तः गोदन्त स्तस्तटशं तुल्याङ्गारं अर्द्धाङ्गुलायतं आननं सुखं यस्याः सा तथा विधया तथा कुठार्या उर्द्वदण्डया अस्थूं उपरिस्थितां सिरां विशेत् । तद्वयं वामहस्तेनोच्चीकृत्य कुठार्यासुखं शिरोपरि संस्थाप्य दक्षिनाङ्गुष्ठतर्जनीभ्यां कुठारिकामस्तकमभिहृत्य सिरां विष्येत् ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ कुठारिकेति कुठारतुल्या कुठारिकाः—

कुठारिकाया बन्तं स्थात् सार्द्धसप्ताङ्गुलायतं ।

फलमर्द्धाङ्गुलायाम् गोदन्सटशं समम् ॥

Nivandha Saṁgrahs, I. viii.

⁴ तथा मध्यमयाङ्गुल्या वैद्योऽङ्गुष्ठ विसुक्तया ।

ताङ्गयेदुत्तितां ज्ञाला स्पर्शाद्वाङ्गुष्ठ पीडनैः ॥

कुठार्या लक्षयेन्मध्ये वामहस्त गटहृतया ।

फलोद्देशे सुनिष्कम्पं शिरां तद्वच्च भोक्षयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

foreibly from the under surface of the thumb". Cakradatta¹ also advises us to use it in a similar manner. To open the veins in fleshy parts, Vāgbhaṭa recommends the vrīhimukha knife, while the kuthārikā is advised to be used in venesection on bony structures.²

Pālakāpya³ mentions the kuthāra and describes its shape to be like an axe. It is to be used for excision and scarification. He describes another śastra called vatsadanta (*lit.*, the calf's tooth); it is ten aṅguli long; and the mouth of the instrument is one and a half aṅguli broad. It is also to be used for excision.

"Bleeding from the jugular vein, he (Albucasis) describes much in the same way that it is now practised by veterinary surgeons, namely, by placing a sort of scalpel bent at the point, which he calls fissorium, upon the vein, and striking the instrument with a hammer or some such body. He gives drawings of variously shaped lancets for opening the veins of the arm."⁴

"Ferriers bleed with a fleam, which, though apparently a clumsy method of operating, is certainly safer than the lancet in

¹ वामहसेन विन्यस्य कुठारौभितरेण तु ।

ताडवेन्द्रध्यमाङ्गुल्याङ्गुष्टविष्टव्यसुक्तया ॥

Cakradatta Śirāvyādhādhikāra.

² मांसले निचिपेहै श्री ब्रौहासं ब्रौहिमावकम् ।

यवाईमस्थासुपरि शिरां विध्वन् कुठारिकाम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ कुठाराक्तिं कुर्यात् । कुठारौ शस्त्रयच्छेदनार्थं । वस्तदनाकृतिं वस्तदनं दशङ्गुलम् । एकोकमध्यं द्वाङ्गुलसुखम् । एवमेतानि च त्रीण्यपि यथायोगं प्रकृत्तार्थं ।

* * * * *

कुठाराक्तिशस्त्रे ण ततसं प्रकृयेहिषक् ।

नातिगाढं न च लघुं न घनं विरलं न च ॥

Pālakāpya, III. iii. *

* Albucasis Chirrug. ii. 97; also see Adam's Commentary on Paul, VI. lx. 323.

unknown hands.” “In bleeding with a fleam, the near side is most convenient. In skilful hands, there is no occasion for a blood stick, as the fleam may be struck with the right hand if it is made broad and round at the back. It also may be made much smaller and neater than that generally employed”. There is a drawing of such an improved fleam which much resembles in appearance the *kuthāri* of the Hindus. “A fleam is rather more convenient instrument in bleeding, either from the arm or thigh, as the vein is somewhat apt to roll when a lancet is used.”¹

15. VṛīHIMUKHA.

It is described as a kind of trocar², the sharp end being pointed and shaped like a grain of paddy. It is six aṅguli long, the handle being two and the blade four aṅguli (Bhoja). But Vāgbhaṭa³ describes the length of the blade to be one and a half aṅguli.

It is advised to be used for paracentesis abdominis in abdominal dropsy. Suśruta says :⁴ "The friends of the patient should

¹ White's Compendium of the Veterinary Art, 1851, 18th ed. P. 342.

² ब्रैह्मसुखमिति ब्रैह्मसुखमिव सुखमस्य ब्रैह्मसुखं तत्र भोजः—
शस्त्रं ब्रैह्मसुखं कार्यमङ्गुलानि षड्यात्यतम् ।
द्वाहुलं तत्र वृन् सात तत्फलं चतुरङ्गुलम् ।
तम्भुखं ब्रैह्मिकारं तवनसंगृदकण्ठकम् ॥

Nivandha Saṅgraha, I. viii.

⁴ उदकोदरिणस्तु वातहरतैलाभ्यक्तस्योदकस्त्रिव्रस्य स्थितस्यात्: सुपरिगद्वीतस्याकचात्-परिवेष्टितस्याधो नाभेर्व्यभितश्चतुरङ्गलमपहाय रोमराज्या ब्रौहिमुखेनाङ्गुष्ठोदर प्रभाणमवगाढं विष्येत ॥

Suśrūṭā Saṃhitā., IV. xiv.

hold him under the axilla. Then the abdomen is to be tapped by the vrīhimukha knife at a point, four āṅguli distant on the left side from the median line, underneath the navel." Vāgbhāṭa¹ advises us to surround a broad bandage round the abdomen before tapping it by the instrument, which he recommends to be introduced up to one āṅguli. Cakradatta² refers to works on surgery for the surgical treatment of ascites. A small incision is directed to be made before the puncture.

In the Aśvavaidyaka, for this operation, the utpalapatra knife is recommended; an incision four āṅguli long is directed to be made above or below the navel of the horse, and then the end of the knife is to be plunged into the abdominal cavity up to one āṅguli.³ The vrīhimukha is also advised to be similarly used.⁴

Hippocrates speaks of evacuating the fluid in paracentesis abdominis with an instrument which Camper thinks must have been a kind of trocar.⁵

¹

सजले जठरे तैलैरभ्यक्तस्थानिलापहैः ।
सिन्धसेणाभ्युना कचमुदरे परिवेष्टिते ॥
वज्ञशिद्रीदितीस्थाने विष्ठे इङ्गुलमाचकम् ।
निधाय तच्छ्रांडीच्च सावयेऽमनभसः ॥
अथास्य नाडीमाक्षाथ तैलेन लवणेन च ।
ब्रणमध्यज्य वहा च वेष्टयेद् वाससोदरम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, IV. xv.

² जातं जातं जलं स्वाव्यं शस्त्रोत्तं शस्त्रकर्षं च ।

Cakradatta, Udaracikitsā.

³ See foot-note, 1. p. 242.

⁴ See foot-note. 4. p. 241.

⁵ See the Commentary on Paul. By Adams, vol. II, P. 338.

It is also to be used for puncturing the vessels in phlebotomy (Vāgbhaṭa)¹ especially in the fleshy parts of the body.² Cakradatta uses vrīhimukha in phlebotomy and says : "The sharp end of the vrīhimukha should be kept under the palm between the thumb and index finger and is to be thrust into the seat of puncture."³

Suśruta directs us to use it in tapping the hydrocele:⁴ "Then the hydrocele is to be wrapped round with a bandage. The fluid is next to be drained by tapping it with a vrīhimukha on the lower part of the scrotum, little externally to the suture." Similar directions are given in the Yogaratnākara.⁵ Cakradatta also gives a similar discription.⁶

¹ ब्रीहिवक्त्रं प्रयोज्यत्वं तत्सिरोदरयोर्ध्येः ।

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

ब्रीहिमुखाख्यं शस्त्रं आह ब्रीहिवक्त्रमित्यादि ब्रीहृवक्त्रमिव वक्त्रं यसर तत् ब्रीहिवक्त्रं ।
ब्रीहिमुखं यथशस्त्रं तत्सिरानां व्यधे व्यधने तथा उदरस्य जलोदरस्य व्यप्ते स्वावणाथं योज्यं ।

Vāgbhaṭārtha Kaumudī. IV. xxvi.

ताड्यन् पौड्येचैनां विध्ये द ब्रीहिमुखेन तु ।

Aṣṭāṅga, Hṛdaya Saṁhitā, I. xxvii.

² मांसले निःचिपेद्वैश्च ब्रीहाख्यं ब्रीहिमाचकम् ।

Ibid.

मांसलेष्ववकाशेषु यवमात्रं शस्त्रं निदध्यादतोऽन्यैष्वर्ज्ययवमात्रं ब्रीहिमात्रं वा ब्रीहिमुखेन ।

Suśruti Saṁhitā. IV. viii.

³ ततो ब्रीहिमुखं व्यधप्रदेशे न्यस्य पौड्येत् ।

अङ्गुष्ठतर्जनीभ्यस्तु तलप्रच्छादितं भिषक् ॥

Cakradatta Śiravyādhadhikāra.

⁴ See foot note 5. P. 123.

⁵ संस्वेद्य मूवप्रभवं वस्त्रखण्डेन वेष्टयेत् ।

सौवन्या पार्श्वतोऽधस्ताविध्येत् ब्रीहिमुखेण चै ॥

Yogaratnākara.

⁶ संस्वेद्य मूवप्रभवं वस्त्रपट्टेन वेष्टयेत् ।

सौवन्या: पार्श्वतोऽधस्ताविद्याब्रीहिमुखेण चै ॥

Chakradatta Viḍḍhi Cikitsā.

Paul describes the operation but he recommends a sharp-pointed knife or lancet instead of a trocar. He says: "Wherefore we must make the patient stand erect; or if this can not be done, we must cause him to be seated; * * *. We give orders to the assistants standing behind to press with their hands and push downwards the swelling to the pubes. Then taking a sharp-pointed knife or lancet, if dropsy be among the intestines, in the perpendicular line of the navel, and about three fingers' breadth distance from it we divide the hypogastrium as far as the peritoneum."¹ Celsus mentions that some perform it at a spot four fingers' breadth below the navel in the left side, and recommends us to use a perforator, the point of which should be about the size of the third part of a fingers' breadth.² Vegetius, the veterinary surgeon, recommends paracentesis for the dropsy of cattle.³ The Arabic authors Avicenna,⁴ Serapion,⁵ Albucasis,⁶ Haly Abbas,⁷ and Rhases,⁸ give similar descriptions.

In modern times, we perform the operation in the same way. "It is necessary in certain conditions to tap the abdomen in order to withdraw fluid which has accumulated there and this is usually done by means of a special trocar and canula. The site for tapping is selected, the usual spot being in the middle line, half-way between the umbilicus and the pubes. A

¹ Paulus *Aegineta*, Bk. VI. I. Syd. Soc. Ed.

² Celsus. vii. 15; ii. 10.

³ Vegetius. *Mulom.* iii. 25.

⁴ Avicenna, iii. 14; iv. 13.

⁵ Serapion. iv. 7.

⁶ Albucasis: *Chirrug.* ii. 54.

⁷ Haly Abbas, *Pract.* ix. 41.

⁸ Rhases, *Cont.* xix.

small puncture about one-third of an inch long is made with the knife at the spot selected. The trocar and canula to which the rubber tubing is attached, are then thrust through the abdominal wall into the peritoneal cavity.”¹

The Greeks did not describe the operation of tapping the hydrocele. They always preferred the open incision to puncture. Paul uses a knife for making the skin incision, but when the tunica vaginalis is laid bare, he divides it through the middle with a lancet for bleeding.² Some of the Arab authors mention the operation of puncturing the scrotum for hydrocele. If the patient be timid, and do not choose to submit to open incisions, Albucasis advises the surgeon to let out the water either with a scalpel or the instrument used for tapping in dropsy. He states, however, that the water will collect again after this operation.³ Rhases also describes this operation.⁴

In modern times, trapping for hydrocele is still practised. “When trapping a hydrocele the patient should be sitting up in a chair * * *. The scrotum, having been cleansed, is grasped from behind by the left hand * * *. A spot, free from any large veins, is selected on the anterior and lower part of the swelling, and the trocar and canula introduced with sharp stabbing movement.”⁵

Pālakāpya⁶ describes vṛihimukha as shaped like a grain of paddy and recommends it for scission and excision of muñja.

¹ Operations of General Practice. By Corner and Pinches. P. 109, 2nd ed.

² Paulus Aegineta, VI. lxii.

³ Albucasis. Chrug. ii. 62.

⁴ Rhases. Cont. xxiv.

⁵ Operations of General Practice, P. 145.

⁶ सर्वणं पाटनं चैव कुर्याद्वौहिमुखेण तु।

16. ĀRĀ OR AWL.

It is a long sharp needle in handle, so called from its resemblance to the shoe-maker's instrument known as awl. "It has a total length of sixteen aṅguli, with a sharp end of the size of a sesamum seed. The handle is tapering like a cow's tail and is equal in circumference to the young stem of Dūrvā (Unodon Dactylon)" (Bhoja)¹. Suśruta mentions its length to be six aṅguli. Vāgbhāṭa describes the length to be one aṅguli, the basal half being round, and the terminal half, four cornered and sharp pointed. The terminal part is introduced into the inflammatory swellings to confirm the diagnosis of suppuration. It is also to be used to drain the congested blood vessels in the matrix of the nails as a result of traumatism².

¹ आरेति, आरेव आरा असिः चर्यकाराणां शस्त्रं । तत्र तत्त्वान्तरम् :—

आरा अर्द्धाङ्गुलयामा कर्तव्या तु विशम्पते ।

तिलप्रमाणन्तु फलं तस्याः कार्यं समाहितं ।

दुर्व्याङ्गुरपरीणाहं छलं गोपुच्छसन्निभं ।

Nivandha Saṃgraha, I. viii.

² व्यधने कर्णपालीनां युथिका मुकुलानना ।

आरार्द्धाङ्गुल छत्तासरा तत्प्रवेशो तथोङ्गृह्णतः ॥

चतुरस्ता तथा विष्वेच्छीयं पक्षाम संशये ।

कर्णपालीन्न वहलां वहलाया न च शसनते ॥

सूचा विभागश्विरा वार्ष्णुला कर्णवेधनी ।

Aṣṭāṅga Hṛdyā Saṃhitā. I. xxvi.

सम्भृति कर्णपालि व्यधन योग्यानि शस्त्राणि वक्तुमाह व्यधने इत्यादि कर्णपालीनां कर्णलतानां व्यधने व्यधनविषये युथिका युथिका नाम शस्त्रं योज्यं । कौटशी ? मुकुलानना मुकुलवत् प्रकृतत्वात् युथिका मुकुलवत् आननं मुखं यस्याः सा तथाविधा । आरेत्यादि अर्द्धाङ्गुलं परिमानं हत्तं वर्तुलं आस्यं मुखं यस्याः सा तथा अर्द्धाङ्गुलछत्तास्या, तथा स एव अर्द्धाङ्गुलप्रमाणः प्रवेशः प्रवेशनं यस्याः सा तथाविधा तत् प्रवेशा तथा ऊर्ज्ज्वरः, हत्तार्द्धाङ्गुलादुपरिष्ठात् तथा अर्द्धाङ्गुलं परिमाणैव चतुरस्ता चतुर्क्षेणा सा आरा कथ्यते ।

It is also said to have been used for perforating a thick lobule of the ear, though for this purpose another instrument called *karna-vedhani* or ear-perforator—a needle specially meant for perforating the lobules of the ears,—is mentioned. It is three anguli long, having a slit or eye in the three-fourths of its length. The barbers used a similar needle to perforate the ears on the ceremony of tonsure.

For piercing the lobule of the ear, another instrument is mentioned. It is called *jūthikā*, from its end resembling in shape the conical bud of *jūthikā* flower (*Jasminum Auriculatum*).

Suśruta uses ārā or pāṇimantha to perforate the bone in diseases of the medullary canal caused by the obstructed and deranged air¹. He next introduces one end of a tube open at

एतेन आराया: फलं एकाङ्गुलपरिभितमिति फलति तत्र प्रथमार्द्धाङ्गुलं ब्रह्मपरार्द्धाङ्गुलं चतुरस्त्रं तथोरुभयभागयोर्मध्ये अगस्थशतुरस्त्रो भागः प्रवेश्योग्य इति सूचितं । तथा आराया पक्काम संशये अथं शोथः पक्क आमोवेति संशये सति ताढशं शोथं विचेष्टत्, तथा वह्लां अतिमांसलां कर्णपालीञ्च तथा विधेयदिति योज्यं । वह्लामित्यन्तेन च्छेदः । वह्लायामित्यादि वह्लायाः अतिमांसलायाः कर्णपाल्याः व्यधने कर्णवेधनी नान्नी सूची च शस्त्रते । कौटीशी ? विभागशुषिरा, विभागः शुषिरं शून्यं यस्याः सा तथाविद्या विभागशुषिरा तथा वाङ्गुला अङ्गुलवयदीर्घा । न कैवल्यमारा वह्लायाः कर्णपाल्या व्यधने शस्त्रते अपि तु कर्णवेधनी नान्नी सूची च शस्त्रते इत्यर्थः । कर्णवेधनीं सूचीं अच्छदेशीया नरसुन्दरा कर्णवेधनार्थं व्यवहरन्ति । अतोऽप्य वाहूख्यवर्णयेति ।

Vāgbhātartha Kaumūdī. I. xxvi.

¹ निरुद्धेऽस्थनि वा वायौ पाणिमयेन दारिते ।

नाड़ीं दत्तास्थनि भिषक् चुषयेत् पवनंवली ॥

Suśruta Samhitā. IV. iv.

निरुद्धे इत्यादि । लड्मांसं शस्त्रेण विपाद्य अस्थि पाणिमयेन अराशस्त्रेण विह्वा तत्र रन्त्रे हिमुखीं नाड़ीं प्रणिधाय सुखमारुतं चूषयेन लवनापकर्षणं करणीयमिति ।

Nivandha Saṅgraha. IV. iv.

both ends into the canal through the hole in the bone, while through the other end the surgeon sucks out the air by his mouth.

For perforating the ears of the elephants, a similar needle is recommended by Pālakāpya. It is known as karmāra or nāli.

17. VETASAPATRAKA.

It is a long sharp cutting instrument shaped like the leaf of the rattan (Calamus Rotang). Its edge is finely serrated and very sharp. The blade and handle are equal in length, measuring four aṅguli. Bhoja says: "The blade is one aṅguli wide"¹. It is said to have been used for puncturing vessels in phlebotomy².

18. VĀPIŚA OR SHARP HOOK.

In shape it is described to resemble the ordinary fish-hook. Bhoja describes the total length to be six aṅguli, its hook being half an aṅguli and its handle five and a half aṅguli long. The end is bent; the curvature varies and may be shaped like a half-moon³.

¹ वेतसपत्रमिति, वेतसपत्रमिव वेतसपत्रमव भोजः—

तीक्ष्णमङ्गुलं विसारं चतुरङ्गुलायतं ।

अङ्गुलानि तु चत्वारि छन्त' कार्यं' विजानता ॥

Nivandha Saṅgraha, I. viii.

² वेतस' व्यधने ।

Aṣṭāṅga Hṛidaya Saṁhitā, I. xxvi.

वेतसपत्रादि शस्त्रमाह वेतसमित्यादि वेतस' वेतसपत्र' नामशस्त्रं सिरादीनां व्यधन कर्मण्य-योज्य' । वेतसपत्रवद्धन्तुरत्वासस्य वेतस' वेतसपत्र' वेत्ति संज्ञा ।

Vāgbhaṭārtha Kaumūḍī, I. xxvi.

³ वडिशमिति वडिशतुल्य' वडिशं मत्सपविधनीमाहः । तत्र तन्नान्तरं :—

वडिशे चापि कर्त्तव्ये प्रमाणे तु षडङ्गुले ।

खानतन्तु तयोरिकमेकं नात्यायतं' भवेत् ।

Suśruta says¹: The end of the hook is sharply edged and is said to have resembled the new leaf of Java (Hordeum vulgare).

It is recommended by Suśruta² to be used for extraction of foreign bodies, e.g., the extraction of stone from the urethra. Its use is also mentioned for transfixing the membranous expansion in the operation for pterygium³ and for fixing and dragging the uvula and tonsil before the performance of any operation on these parts⁴. Cakradatta⁵ mentions its use for fixing a growth, before its excision by the knife.

अर्द्धापच्चाहुलं छन्तं शेषं कार्यं सुखं तयोः ।
अर्द्धचन्द्राकृति वक्रं कार्यं नात्याननतस्त्र तु ।
खानतं नामयेत् तव वडिशच्चभिषग्वरः ।
छन्तायश्चोरन्तरं स्नाद यावदर्ढाङ्गुलं मतं ।

Nivandha Saṃgraha, I. viii.

¹ वडिशोदन्तशङ्कुशानतागे तौच्चकण्टक प्रथमयवपवसुखे ।

Suśruta Saṃhitā, I, viii.

² यट्टक्षया वा सुचमार्गप्रतिपन्नाभन्तरासकां शुक्राश्मरौ शर्करां वा स्त्रीतसा अपहरेत् एवं चाशक्ये विदार्थं वा नाड़ीं शस्त्रेण वडिशेनोऽरेत् ।

Suśrutā Saṃhitā, IV. vii.

³ गहणेशुष्ठिकार्मादैर्वडिशः सुनताननः ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi

वडिशस्त्रमाह गहणे इत्यादि सुषु नतं अङ्गशवत् नस्त्रातं आननं सुखं यथ स तथाविधः सुनताननः वडिशं भत्यवेधनवत् वडिशेनाम शस्त्रं स्नात् । स च शुष्ठिकार्मादैर्वडिशः । अदिपद्देण उपजिह्विकादै परिग्रहः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ पिङ्कासुत्तमाल्याच्च वडिशेनोदुरेन्द्रिष्ठक् ।

उङ्गूत्य भध्यसंयुक्तैः कषायैरवचूर्णयेत् ॥

Suśruta Saṃhitā, IV. xxi.

⁵ उत्तमाल्यानुपिङ्कां संक्षिय वडिशीङ्गुताम् ।

Cakradatta, Śukrādoṣa Cikitsā,

It was also used for fixing any growth in the eye, previous to its excision by the *maṇḍalāgra*¹. For this purpose the Greeks used the vulsellum (myzon). Aetius says: "If there is a large and malignant excrescence in the angle of the orbit, the enlarged part must be seized with vulsellæ and cut off."²

Evidently *vadiṣa* was used on many occasions when in modern times we use the dissection forceps to steady a part before excision.

Vadiṣa is described in the *Aśvavaidyaka*³ to have been similarly used during the operation of pterygium in horses.

*Pālakāpya*⁴ mentions *vadiṣa* which is described as eight aṅguli long, the end being rounded like a wheel. It is to be used for raising the membranes of the eye globe.

Sharp hooks were used by the Greeks and Romans, for similar purposes. The use of the sharp hook for fixing the pterygium is mentioned by Celsus⁵, Aetius⁶, Paul⁷ and Albucasis⁸.

Its use in the excision of the tonsil is mentioned by Paul⁹. After the patient being placed in the proper position, he narrates: "We take a hook (tenaculum) and perforate the

¹ See foot notes 1, 2 and 3, P. 227.

² Aetius. vi. 74.

³ चितौ निपात्य तुरं ततोनेव प्रसारयेत् ।

ततकर्मा भिषग्विदान् वडिशेनाचिवर्त्म नि ॥

Aśvavaidyaka, XXX. v. 32.

⁴ वडिशं चक्रायमष्टाङ्गलप्रमाणमत्त्वोः पठलोङ्गरनार्थं चेति ।

Pālakāpya, III. xxx.

⁵ Celsus. VII. vii.

⁶ Aetius. Tet. ii, iii, 60.

⁷ Paul. VI. xviii.

⁸ Albucasis. Chirrugi, ii, 16.

⁹ Paul. VI. xxx.

tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to the hand, called ancylotomus, for there are two such instruments, having opposite characters".

19. DANTA ŚĀNKU OR TOOTH-SCALER.

Its head is half an aṅguli long. It is quadrangular in shape and has a sharp edge. Suśruta¹ describes the end as slightly bent, sharp and shaped like the fresh leaf of Java. Bhoja² describes the end to be like that of the vrīhimukha.

Vāgbhaṭa³ describes a similar instrument called dantalekhana or tooth-scaler. It is also quadrangular in shape, one side being sharp-edged and the opposite side little lengthened. It is

¹ See foot note 1. P. 265.

² एवं हि क्रियते एतौ दशशङ्कुर्विजानता ।

शङ्कु वच सुखं तस्य कार्यमङ्गलाङ्गुलायतम् ॥

चतुरस्त्रं समञ्चेव तीक्ष्णधारं समाहितं ।

हत्तागं तस्य कर्तव्यं शस्त्रं त्रीहिसुखाकृतिं ।

कपालिकां शक्तराच्च दन्तस्थानेन शोधयेत् ॥

Nivandha Saṃgraha, I. viii.

³ एकधारं चतुर्षोषं प्रवृद्धाकृति चैकतः ।

दन्तलिखनकं तेन शोधयेद्दन्तशक्तरान् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

दन्तलिखन शस्त्रमाह एक धारभित्यादि एका धारा यस्य तत् एकधारं चत्वारः कीणा यस्य तत् चतुर्षोषं कोणः कीणा इति यस्य प्रसिद्धिः तथा एकतः एकदेशात् प्रवृद्धा वैद्यनशीला आकृतिः आकारो यस्य तज्ज्ञाविधिः प्रवृद्धाकृति दन्तलिखनं दन्तलिखनाख्यं शस्त्रं सग्राम् तेन दन्तलिखनाख्येन शस्त्रेण दन्तशक्तरान् दन्तनिवज्ज्ञान् शक्तराच्यान् लिखयेत् कर्शयेदित्यर्थः । दन्तालिखन्यन्ते अनेनेति दन्तलिखनं दन्तशक्तरा पाथरि इति लोके ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

recommended to be used for the extraction of sordes and tartar from the teeth ¹.

The procedure of the operation of tooth-extraction is not described in detail in the medical books of the Hindus. But the operation seems to have been well known, for Suśruta distinctly advises the students to practise the operation of extraction on the fruits of Panas (*Atrocarpus Integifolia*), Vimbī (*Cephalandra Indica*), Vilva (*Ægle Marmelos*) and on the teeth of the dead animals ². He also advises us to extract the wisdom teeth and to apply cautery to their sockets ³. Also when a tooth becomes loose he directs us to extract it and apply cautery to the socket ⁴. In the treatment of sinus caused by carious tooth, he advises us to extract the tooth, otherwise the sinus would extend down to the inferior maxillary bone ⁵.

¹ शस्त्रेण दन्तवैदर्भं दन्तमूलानि शोधयेत् ।

* * * *

अहिंसन् दन्तमूलानि शर्करामुड्डरेद्भिषक् ।

Suśruta Samhitā, IV. xxii.

² See foot note 2. P. 280.

³ उद्धृत्याधिकदन्तान् ततोऽग्निमवचारयेत् ।

अग्निदन्तक-वच्चापि विधिः कार्यो विजानता ॥

Suśruta Samhitā, IV. xxii,

⁴ चलमुड्ड्य च स्थानं विदहेच्छुषिरसा च ।

Ibid.

⁵ यन्तनमधिजायेत नाडी तंदनमुड्डरेत् ।

शिला मांसानि शस्त्रेण यदि नोपरिजीभवेत् ॥

शोधयित्वा दहेद्वापि चारेण ज्वलनेन वा ।

भिनत्युपेचिते दन्ते हनुकास्थि गतिप्रवृत्तं ॥

समूलं दशनं तथादुड्डरेद्भग्नमस्थि च ॥

उड्डतेतूचरे दन्ते सश्लेष्यिरवस्थने ॥

Ibid.

Pālakāpya¹ mentions the extraction of tooth of the elephant by means of enīpada which is an iron bar, thirty-two anguli long and equal to the tooth in circumference.

Paul says² : “The laminæ which unite to them (the teeth) we may remove as may appear proper, with the concave part of a specillum, a raspatory, or a file.” The operation of tooth-extraction was however, not liked by the ancient Greeks as cases in which the operation proved fatal, occurred in their practice. Cælius Aurelianus, Herophilus, and Galen disapprove in general of the operation, except in extreme cases.

It would, no doubt, be interesting to know that in ancient India, the Hindus knew how to make false teeth to be used by men who have lost them either by accident or by extraction by the dentists. In 1194 A.D., Sahabuddin defeated Jayacandra in battle, “and the incident of the body of the rāja being recognised by his false teeth³—a circumstance which throws some light on the state of manners” is well known.

20. EṢĀNĪ OR SHARP PROBES.

“The probes”, says Caraka⁴, “are of two kinds, the hard or

¹ द्वाविंशदङ्गुलायतदश्नपरिनाहिन लौहदण्डे न ।
एनीपदेन कुर्यादुद्धरणं तयोः सम्यक् ॥
ब्रैहिमुखेन च परिशोध्य सर्वस्तसा दन्तमूलेषु ।
उथोदकघौतेषु मधुसर्पिः पूरणं दद्यात् ॥

Pālakāpya, III. xviii.

² Paul. VI. xxviii.

³ Elphinstone's History of India, P. 365, 5th Ed.

⁴ द्विविधासेषणां विद्यान्मृदौच्च कठिनामपि ।
उड्हिदैस्तुभिर्नालैर्हिनां वा श्लाकया ॥
गभीरमांसगे देशे पाञ्चे लौहश्लाकया ।
एषं विद्याद ब्रणं नालैविपरीतमतो भिषक् ॥

Caraka Samhitā, VI. xiii,

metallic probes, and the soft probes such as the young stems of plants. The hard probes are required for deep sinuses in the fleshy parts and the sides of the body, while the softer varieties are used for probing the superficial sinuses¹. The ends of the probes are generally shaped like the head of the earth-worms². Suśruta³ describes them to be eight aṅguli long. They are to be used as probes to ascertain the direction of sinuses.³ The blunt probes have been described before under the śalākās.⁴

The sharp probes have the shape of a needle and are six aṅguli long. The other end carries an eye through which is put one end of a caustic thread (*i.e.*, thread soaked in caustic lotion and then dried). The probe is to be used for piercing the tissues through the blind end of the sinus. The end of the thread is next to be withdrawn from the eye of the probe and a tight knot applied with the other end. The intervening bridge of tissues is thus gradually cut and the sinus opened. If the cord be found inefficient for the purpose, a second thread is to be tied similarly.⁵

¹ एषश्चौ गरुपदाकारसुखी ।

Suśruta Saṁhitā, I. viii.

² तत्र नस्तशस्त्रै षण्यावष्टाङ्गुले ।

Ibid.

³ गतेरन्वेषये शक्ता गरुपदसुखैषयोः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

एषाख्यत्वं शस्त्रमाह गतेरित्यादि एषयीनाम शस्त्रं गतेः नाडीब्रह्मसर पूयादिपथस्य अन्वेषये अभ्यवेचये योज्यं । सा चैषनी शक्ता कोमलस्पर्शी, तथा गरुपदसुखा, महीलता सुखाकार सुखा च भवति ।

Vāgbhaṭṭārtha Kaumūdī, I. xxvi.

⁴ See page 155-7.

⁵ क्षशदुर्बलभीरुद्यां नाडीमर्घश्चिताच या ।

चारसूत्रेण तां क्रिद्याद्र तु शस्त्रेण बुद्धिमान् ॥

This method of treatment is recommended for the weak and timid patients. The needle-shaped probe is also to be used in the extirpation of new growths by means of caustic threads. Cakradatta¹ also describes this operation ; evidently he copies it from Suśruta. In the Yogaratnākara² the verses describing the operation are also quoted. Vāgbhaṭa also mentions a needle-shaped probe for the same purpose.³

In treating of fistula-in-ano, Paul quotes from Hippocrates and says⁴ :—“For Hippocrates directs us to pass a raw thread,

एषणा गतिमन्विष्य चारसूचानुसारिणीम् ।
सूचौ निदध्याहृत्यन्ते तथोन्नम्याशु निर्हरेत् ॥
सूचसग्रान्तं समानीय गाढवन्धं समाचरेत् ।
ततः चार वलं बीत्य सूवमन्त् प्रवेशयेत् ॥
चारक्कं भतिमान् वैद्यो यावन्नच्छियते गतिः ।
भगन्दरेऽप्येष विधिः कार्थ्यः वैद्येन जानता ॥
अर्बुदादिसु चीतचिप्य मूले सूचं निधापयेत् ।
सूचीभियोववक्काभिराचितं वा समन्ततः ।
मूले सूवेण वज्ञीयाच्छिप्ते चोपचरेद्वाणः ॥

Suśruta Saṃhitā, IV. xvii.

¹ These verses are quoted in the Cakradatta, Nādivaraṇa Cikitsā.

² Also quoted in the Yogaratnākara, P. 346.

³ भेदनाथेऽपरा सूचौमुखा मूलनिविष्टखा ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

अपरमयेषणौ शस्त्रमाह । भेदनाथे इत्यादि भेदनाथे नाडीत्रणानां गतिभेदनर्थे अपरा पूर्वोक्ताया एषणा अन्या सूचौमुखा सूचाकार मुखा सग्रात् तथा मूले मूलदेशे निविष्टं, सूतनिवेश योग्यं खं क्षिद्रं यसाः सा मूलनिविष्टखा सच्छिद्रमूलमित्यर्थः । असां एषणामूले क्षिद्रकरणं चारक्तसूचनिवस्थनार्थं । तेन प्रभिन्न इत्यनिष्ठाशितेन दृढवन्धेन चारसूवेण नाडीत्रणः प्रकाशयते ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ Paul: VI lxxviii.

consisting of five pieces, through the fistula by means of a probe having a perforation, or a double headed specillum; and to tie the ends of the thread and tighten it every day until the whole intermediate substance between the orifices be divided and the ligature fall out". Hippocrates¹ describes minutely the apolinose and recommends it for those who from timidity avoid a surgical operation. Celsus recommends the thread to be smeared with some escharotic ointment. The process, he says, is slow but free from pain². Albucasis³ also approves of the operation according to circumstances. The operation called apolinose *i.e.*, by the ligature, is very celebrated. Ambrose Pare, Foubert, Camper, Giudo de Cauliaco and Rogerius approve of the ligature. It has been recommended by some of the modern surgeons⁴. The operation is still practised in India by the Madrasi specialists for fistula-in-ano.

Vāgbhaṭa⁵ describes copper probes having the sharp ends shaped like the buds of Kuravaka (*Baleria Cristata*) to be used in

¹ Hippocrates. 'De Fistulis'.

² Celsus. vii. 4.

³ Albucasis. Chirrug. ii. 80.

⁴ Lancet. vol. 1. 1845, new series.

⁵ तामी श्लाका दिसुखा सुखे कुरवकाङ्गतिः ।
लिङ्ग नाशं तथा विष्येत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā. I. xxvi.

श्लाका शस्त्रं अङ्गुलि शस्त्रव्वाह तामीत्यादि दिसुखा, दिङ्गारा, सुखे, सुखप्रदेशे कुरवका
ङ्गतिः, रक्तभिरङ्गौपुष्थ मुक्तालकारा, तामी, ताम्भयौ, श्लाका, श्लाका शस्त्रं सग्रात् । तथा
श्लाकया लिङ्गनाशं, कफोत्यं पठल संज्ञकं चच्चरोग विशेषं विष्येत् । विष्येदित्यने न
च्छैदः ।

the operation of cataract. Suśrīta¹ describes such a probe to be eight aṅguli long, made of copper, or iron, or gold, the ends being shaped like buds. A thread is spirally twisted round the middle of the instrument for a length of a thumb's breadth, to afford a firm grasp by the surgeon's fingers. This instrument must not be rough, thick or very sharp, for then there would be a greater chance of the eye being injured more than is necessary and at many places. So also in couching of cataract, Celsus says: "Then a needle is to be applied, sharp so as to penetrate, but not too fine."²

Pālakāpya³ mentions eṣaṇī in the surgical treatment of diseases of the elephants. He describes three probes,—smooth and shaped like the collyrium rods. They are recommended to be ten, twenty and thirty aṅguli long respectively.

¹ श्लाका कर्कशागूलं खरा दोषपरिप्रुति ।
ब्रणं विशालं स्युलाभा तीक्ष्णा हिंसादनेकधा ॥
जलास्थावन्तु विषमा क्रियासङ्घमथास्थिरा ।
करोति वर्जिता दोषेष्टादेभिर्हिता भवेत् ॥
अष्टाङ्गुलायाता मध्ये सूतेण परिवेष्टिता ।
अङ्गुष्ठ पञ्चसमिता वक्रयोर्मुकुला छतिः ॥
ताम्बायसौ शतकौश्ची श्लाका सगादनिन्दिता ।

Suśrīta Saṃhitā, VI. xvii.

² Celsus. VII: viii.

³ स्थिरा सृङ्गी च कर्त्तव्या त्रणानामेषणी भवेत् ।
हत्ता गण्डपदसुखौ प्रभाषि विशदाङ्गुलौ ॥
सुवर्णकृप्यताम्बायसौ शङ्खजाइपि वा ।
दन्तास्थिवेनुदारुणामेषणी दारुणा भवेत् ॥

Pālakāpya, III. i.

एषणी दशाङ्गुला विश्वलूला विशदाङ्गुला यथायोगमञ्जनश्लाकाकृति सुखतः स्त्रिया समा चैवमितास्त्रिय एषणः प्रभाषतः कार्याः ।

Ibid, III. xxx.

The operation of couching for cataract is essentially an Indian operation; and Suśruta describes the operation minutely as follows :—

The operation of couching for cataract.

Suśruta says¹ : “Now we shall describe the treatment of cataract caused by phlegm. If inside the crystalline lens, anything is seen like a half-moon-shaped drop of water or pearl, hard, irregular

४ शैषिके लिङ्गनाशे तु कर्म वच्चानि सिद्धये ।
न चेदद्वेष्टनुघर्भात्मुविन्दुसुक्राकृतिः स्थिरः ॥
विषभो वा तनुर्मध्ये राजिमान्वा वहुप्रभः ।
दृष्टिस्थो लक्ष्यते दोषः सरुजा वा सुलोहितः ॥
स्त्रिघस्त्रिनस्य तसाय काले नात्युण्णशौतले ।
यन्त्रितस्थोपविष्टस्य खान्द्रासां पश्यतः सम् ॥
मतिमान् शुलभागौ द्वौ कण्णात्मुक्तात्मपाङ्गतः ।
उन्मोख्यं नयने सम्यक् शिराजालं विवर्जिते ॥
नाधो नोर्जित्तं पार्श्वाभ्यां छिद्रे देवकृते ततः ।
शलाकाया प्रथबेन विश्वस्त् यववक्रया ॥
मध्य प्रदेशिन्द्रियस्थिरहस्तं गृहीतया ।
दक्षिणेन भिषक् सव्यं विध्येत् सव्येन चितरत् ॥
वारिविन्दागमः सम्यक् भवेच्छब्दस्थाव्यधि ।
संसिद्धं विज्ञमावन्तु योषितस्येन कोविदः ॥
स्थिरे दोषे चले वापि स्वेदयेदक्षि वात्यतः ।
सम्यक् शलाकां संस्थाप्याभ्यङ्करं निलानाशनैः ॥
शलाकायेण तु ततो निर्जिखेहृष्टिमण्डलं ।
विध्यतो योऽन्यं पार्श्वेऽत्यस्त् रुद्धा नासिकापुटं ॥
उच्छ्रिष्टनेन हत्त्वा दृष्टिमन्त्तलजः कफः ।
निरस्त्र इव घर्भांशुर्व्यदा दृष्टिः प्रकाशते ॥
तदासौ लिखिता सम्यग् ज्ञेया याचापि निर्व्यथा ।
ततो इष्टेषु रूपेषु शलाकामाहरेच्छनैः ॥

or thin, striated or shinning, painful or red, caused by the deranged humours, the oleaginous applications and fomentations are to be tried first at a time when it is neither hot nor cold; then he (patient) is to be ligatured after having him seated conveniently, and should be directed to look towards his own nose. The intelligent (surgeon), then separating the white part from the black part and the external canthus of the eye after opening it, avoiding the vascular network, and leaving the parts above and below intact, is to pass a yavamukhī śalākā (or sharp needle having its end resembling a wheat) through a natural opening on the side, steadily holding the rod with the thumb, index and middle fingers. If the operation be required on the right eye, the left hand, and if on the left eye, the right hand of the surgeon should use the needle in puncturing. A successful puncture is known by the escape of a drop of fluid and an audible sound. The experienced surgeon is to sprinkle woman's milk just after the puncture, and keeping the needle there, whether the deranged humour be movable or not, should apply fomentations externally by means of oily remedies for the deranged air. The crystalline lens is next to be scarified by the sharp end of the needle. Then keeping the needle fixed in the side of the eye, the patient should be directed to sniff so as to destroy the phlegm of the lens. The proper scarification will be indicated when the lens appears brilliant as the sun uncovered by clouds. Then the vision being clear, the needle in the side of the eye, is to be removed; and the eye is to be well

घृतेनाभ्यज्य नयनं पस्त्रपट्टेन बेष्टयेत् ।

ततो गृहे निरावधि शथीतीत्तान् एव च ॥

soaked with ghee (melted butter) and bandaged properly.” Vāgbhaṭa also describes the operation similarly.¹

To this we may compare the account of the operation as given by Celsus. He “lays it down as a rule, that when the suffusion is small, immovable, and of the colour of sea water, or of shinning iron, and if a small degree of light can be percieved at the side, there is reason to hope well of the case. He forbids us to operate until the disease has attained a proper consistence. He directs us to place the patient opposite the operator, who is to sit on a higher seat, while the patient’s head

¹ अथ साधारणे काले शुद्धसंभोजितात्मनः ।
देशी प्रकाशे पूर्वाङ्गे भिषग् जानुच्च पौठगः ॥
यान्वितस्योपविद्यस्य लिङ्गाक्षसा मुखानिलैः ।
अहुष्ट स्थिति नेत्रे दृष्टौ दृष्टेऽप्स्तं मलम् ॥
स्वनासां प्रे चमाणस्य निष्कर्षं मुक्तिं धारिति ।
कण्ठादर्ढाङ्गुलं मुक्ता तदर्ढार्डमपाङ्गतः ॥
तर्जनीमध्यमाङ्गुष्ठैः शलाकां निश्चलं ध्रुताम् ।
दैवच्छिद्र' नयेत् पाश्वादूर्जमामस्थान्निव ॥
सर्वं दक्षिणाहसेन नेत्रं सर्वेन चेतरत् ।
विष्टेत् सुविष्टे शब्दः स्यादरक चाम्बुलवसुतिः ॥
सान्त्वयन्नातुरं चानु नेत्रं स्वयेन सेचयेत् ।
शलाकायास्तोऽयेष निलिखेन्नेचमण्डलं ॥
अवाधमानः शनकैर्नासां प्रतिनुद्दस्ततः ।
उच्छिच्छनाच्चापहरेद् दृष्टिमण्डलं कफम् ।
स्थिरे दोषे चले चापि स्वे ददीदक्षिवाद्यतः ॥
अथ दृष्टेषु रूपेषु शलाकामाहरेच्छनैः ।
घृताङ्गुलं पितॄं दत्त्वा वडाकं शाययेत्ततः ॥
विज्ञादन्येन पाश्वेन तमुत्तानं इयोर्व्यधे ।
निवाते शयनेऽभ्यक्तशिरः पादं हितेरतम् ॥

is held by an assistant. The sound eye is to be previously covered up with wool. If the left eye is affected, the operator must use his right hand, and *vice versa*. A needle which is sharp and not too slender is to be passed direct through the two coats at a place intermediate between the temporal angle and the black of the eye, and towards the middle of the cataract. When the needle has perforated far enough, which is readily known by the absence of resistance, it is to be turned so as gradually to remove the cataract below the region of the pupil and this object being attained it is to be strongly pressed to the lower part. If it remain there the operation is completed, but if it return, it is to be cut and torn by the needle into many pieces, in which state they are easier depressed, and prove less troublesome. The needle is then to be drawn out direct and soft wool smeared with white of an egg, and other anti-inflammatory applications are to be used. Quiet, restricted diet, and soothing treatment will be proper.¹" Paul², Mesue³, Albucasis⁴, Rhazes⁵ and others also describe the operation of couching in similar terms. Albucasis gives figures of these needles.

The operation is still practised in India by the māls who consider themselves specialists in diseases of the eyes.

21. SARPAŚYA.

Vāgbhaṭa describes an instrument having its end resembling

¹ Celsus. vi. See Adam's Commentary to Paul VI. xxi.

² Paul. VI. xxi.

³ Mesue. De Aegr. oculi, 15.

⁴ Albucasis. Chirrug, II. 23.

⁵ Rhazes. Ad mansor.

the mouth of a snake ¹. The blade is said to be half an anguli long. It is advised to be used for excision of the nasal and aural polypi.

The fact that it was able to work inside the nose and the auditory canal shows that it could not have been of any great breadth, possibly less than a quarter of an inch at the most. The exact shape of the sarpāsyā can not be determined with certainty. The Greeks however used for the same purpose, "a polypus scalpel, having its extremity shaped like a myrtle leaf," which was a double instrument, the other end being a scoop ².

GOLD OR SILVER KNIFE.

To cut the navel cord, Caraka ³ recommends the use of a knife, made of gold, or silver, or iron. To make gold and silver knives of sharp edges seems absonous to our reason, but we must remember that to cut the navel cord, a very keen edge is not required, and even now the purpose is often served by the native dhāis with a piece of split bamboo.

¹ सर्पास्य न्राणकर्णश्चेदनेऽद्वाङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

सर्पास्यं नाम शस्त्रमाह । सर्पास्यं इत्यादि सपास्यं नाम शस्त्रं नासिका कर्णश्शस्यां क्षेदने योज्यं तत्र फले अङ्गुलार्दपरिमितं अङ्गुलपरिमितं फलकमित्यर्थः । अस्य सर्पेसुखसहश सुखलात् सर्पास्यमिति संज्ञा ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

² Paul. VI. xxv.

³ See foot-note 4. P. 65.

PRATUDA.

Suśruta mentions it as a knife to be used for making scarifications on the body of a lunatic.¹

The mode of holding the sharp instruments.

Suśruta says² : “The vr̥ddhipatra is to be held at the junction of the handle and the blade; and all instruments used for incision should be held similarly. The vr̥ddhipatra and mandalāgra, if used for scarification, should be held with the hand raised a little; when used for evacuating abscesses, they, as well as all other instruments, should be held by the fore part of the handle. But in the case of children, old or delicate or timid persons, women, and kings and princes, abscesses should be evacuated with the trikūrcaka. The vr̥himukha is to be held with the thumb and forefinger, its handle being covered within the palm. The kuṭhārikā is to be held in position with the left hand, and struck with the middle finger when let go forcibly from the under surface of the thumb of the right hand. The ārā, karapatra and eṣanī should be held at their extremities.

¹ प्रतुदैर्दात्येतच्चैन् भर्त्यधात् विवर्जयेत् ।
सर्पिधाने जरत्कूपे सतत् वा निवासयेत् ॥

Suśruta Saṃhitā, VI. liii.

² तेषामथयोग यह्यं समासोपायः कर्म्मसु वल्यते । तव ड्हिपत्रं डन्तफलसाधारणे भागे गृजीयहिदनान्येवं सर्वाणि । ड्हिपत्रं मरुलागच्छ किञ्चिदुत्तानपाणिना लेखने वडुशोऽवचार्यं डुलाये विश्वावणानि । विशेषेण वालहङ्कुमार भीरु नारीणां राज्ञां राजपुत्राणाच्च विकूर्चकेन विश्वावयेत् । तल प्रच्छादित डन्तमङ्गुष्ठ प्रदेशिनीभ्यां ब्रीहिसुखं । कुठारिकां वामहस्तन्यस्तामित-रहस्त मध्यमाङ्गुल्याङ्गुष्ठ विषभयाभिहन्यात् । आराकरपतैषेष्यो मूले । शेषाणि तु यथायोगं गृजीयात् ।

Suśruta Saṃhitā, I. viii.

The other instruments are to be held as required in particular cases." Vāgbhata also gives similar directions ¹.

The practical training in surgical operations.

Sūsruta says ² : "Even after a pupil has mastered the whole of the medical treatises, the preceptor should instruct him practically how to perform surgical operations and how to administer oils and other medicines. However learned he may be in books, he cannot be fit for surgical practice, unless he has acquired the practical training. Therefore the preceptor should show his pupils the methods of operations, of incision, excision and division, upwards and downwards on the pumpkin, bottle-gourds, water-melons, and the three varieties of cucumbers—Trapusa (*Cucumis Sativus*), Ervārūka (*Cucumis Utilissimus*), and Karkarūka (*Cucumis Melo*).

१ क्षेत्र भेदेन लेखार्थं शस्त्रं हन्त फलान्तरे ।
तज्जनी भध्याङ्गुष्टेर्ग्नीयात् सुसमाहितः ।
विस्तावणादि छन्ताये तज्जन्यङ्गुष्टके न च ।
तल प्रकट्र छन्तायं गात्म्यं ब्रौहिसुखं सुखे ।
मूलिष्वाहरणार्थानि क्रिया सौकर्यतोऽपरं ॥

Aṣṭāṅgā Hṛdaya Saṁhitā. I. xxvi.

२ अधिगत सर्वशास्त्रार्थमपि शिष्यं योग्याङ्गारथेत् । क्षेत्रादिषु चेहादिषु च कर्त्त्वपथसुप-
दिशेत् । सुवहश्चुतोप्यक्त योग्यः कर्त्त्वस्योग्यो भवति । तत्र पुष्टफलालाबू कालिन्दक-
वपुवैर्वारुककर्कारुक प्रधतिषु क्षेत्र विशेषान् दर्शयेदुत्कर्त्त्वनपरिकर्त्त्वानानि चोपदिशेत् ।
इति वस्ति प्रसेवक प्रधतिषुदकपङ्ग पूर्णेषु भेद्य योग्यां । सरोग्नि चर्माल्पातते लिख्यस्य ।
मृत पशुसिरासृतपलनालेषु च विभ्यस्य । चुणोपहत काष्ठवेण नलनालीयुक्तालाबुमुखेष्वे घस्य ।
पनश्चविम्बीविल्वफलमज्जस्तपशुदन्तेष्वाहार्थस्य । मधुच्छिष्टोपलिमे शाळ्मलीफलके विस्ताव्यस्य ।
मृच्छाघनवस्त्रान्तयोर्मुदुचर्मालयोश्च सौव्यस्य । पुस्तमय पुष्टवाङ्ग्नप्रत्यङ्ग्न विशेषिषु वस्तयोग्यां ।
मृदुमासपेशीषूतपलनालेषु च कर्णसन्धिवन्धयोग्यां । मृदुषु मासखण्डेष्वग्निचारयोग्यां । उदक
पूर्णघटपार्श्वं स्रोतस्यलालाबूमुखादिषु च नेत्रप्रणिधानवस्त्रिव्रय वस्ति पौड़न योग्यान्विति ।

Sūsruta Saṁhitā. I. ix.

The operation of puncturing or tapping may be demonstrated on leather bags, bladders and pouches, filled with slush; scarifications, on stretched pieces of leather covered with hair; opening on the veins of dead animals or on stalks of water-lily; probing on worm-eaten wood, bamboo, reed, tube or dried bottle-gourd; extraction, on the pulp of jack fruit, the Bael fruit (*Ægle Marmelos*), Vimbī fruit (*Cephalandra Indica*) or on the teeth of dead animals. Evacuation on a lump of wax applied to a board of Śālmali wood (*Bombax Malabaricum*); sewing, on the two ends of a thick piece of cloth or soft leather; bandaging on the limbs of a dummy (human figure made of cloth and clay), bandaging the root of the ear, on a piece of soft flesh, or the stalk of a water-lily; application of cauteries, on pieces of flesh; introduction of tubes for clysters (urethral, rectal and vaginal) and wound-syringe, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects.”

CHAPTER VII.

THE ANUŚASTRA.

The anuśastra means substitutes for cutting instruments. They are the following¹ :—

1. Bamboo.
2. crystal.
3. glass.
4. ruby.
5. leeches.
6. fire.
7. caustics.
8. the nails.
9. leaves of Goji (*Elephantobus Seaber*),
10. *Sephālikā* (*Nyctanthe Arboristris*), and
11. *Śākhā* (*Tectona Grandis*).
12. young stems of plants.
13. hair
14. finger.

These are advised to be used in case of infants or timid persons or when the proper instruments are not available.²

1. BAMBOO.

A piece of split bamboo is said to have been used for cutting through and cutting into some parts of the body. It is still used by the native dhāis or midwives for cutting the funis.

A piece of bamboo is directed to be used for applying pressure on small boils to cure them by subsidence³. For the same purpose, the pressure of the thumb is also recommended⁴.

¹ अनुशस्त्राणि तु लक्षारस्फटिकाचकुरुत्रिन्दजलीकाप्रिच्छारनखगोजीशफालिकाशकपद करीवालाङ्गुलय इति ।

Suśruta Samhitā. I. viii.

² शिशुनां शस्त्रभौषणां शस्त्राभावे च योजयेत् ।
लक्षारादि चतुर्वर्गं क्षेये मेये च बुद्धिमान् ॥

Ibid.

³ हृतेषु दोषेषु यथानुपूर्वे ग्रन्थौ भिषक् श्वेष समुत्तिते तु ॥
स्त्रिनाय विनापनमेव कुर्यादङ्गुष्ठलोहोपलवेण दण्डैः ।

Ibid. IV. xviii.

⁴ अभ्यज्य स्त्रेदयिला च वेणुनाद्या ततः श्वैः ।
विनापनादौ मद्वैयात् तस्मेनाङ्गुष्ठकेन वा ॥

Cakradatta, Vranasothā Cikitsā,

Bamboo is also mentioned to have supplied largely the materials of splints for treatment of fractures and dislocations. For this purpose it is to be split into thin layers¹. Split bamboo is still used for the treatment of fractures by the kavirājes and might advantageously be used by the modern surgeons as a cheap and easily available material for splint.

Dissection.

It is generally supposed that the practice of dissection of the human body for anatomical studies was unknown to the ancients. But the practice of human dissection is unmistakably referred to in the Suśruta Saṁhitā.² Brushes made of bamboo, barks of trees, grass roots, and hairs are mentioned as instruments of dissection. "Thus a body should be secured which is complete in all the parts and which is of a person who was not more than 100 years old, nor who died from the effects of poison or of a chronic disease. Having cleared the intestines of any faecal matter, the body should be well wrapped either in Muñja (Saccharum Munja), or grass, or barks of trees or hemp etc., put inside a cage which should be firmly fastened, in a solitary spot, in a calm river and thus allowed to decompose. After seven nights, having taken out

¹ विभग्नं नरं दृष्टा वेणुखण्डे न वन्धयेत् ।

मृदयेन्नवलीतैररुपत्रश्च वेष्टयेत् ॥

Hārita Saṁhitā, II.I ivi.

² तत्कालसमस्तगात्रभिषोपहतमदौर्बल्याधिपीडितमवर्धशतिक' निःस्थाप्तपुरीष' पुरुषम-वहन्त्यमापगायां निवद्ध' पञ्चरस्य' सुञ्जवल्कलकुशश्शणादीनामन्यतमेनाविष्टाङ्गमप्रकाशे देशे कोथयेत् सम्यक् प्रकृथितचोऽृत्य ततो देह' सप्तरात्रादुशीर वालवेणु वल्कल कूचीनामन्यतमेन झेनैः शनैरवघर्षयं स्वगादीन् सर्वानेव वाञ्छाभ्यन्तराङ्गप्रत्यक्षं विशेषान् यथोक्तान् लज्जयेष्वन्नाम ।

Suśruta Saṁhitā, III. v.

the thoroughly decomposed body, it should be slowly rubbed with a brush made either of *Uṣīra* (*Andropagon Muricatus*) or hair, or bamboo, or barks of trees, examining at the same time with the eyes, every division and sub-division of the body, external or internal, beginning with the skin, as delineated in the śāstras." Animal anatomy was also thoroughly understood as each part of the body had its own distinctive name.

Hoernle¹ says : "Probably it will come as a surprise to many as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising, when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.*** Of the practice of such dissection in ancient India we have direct proof in the medical compendium of Suśruta, and it is indirectly confirmed by the statements of Caraka. It is worthy of note, however, that in the writings of neither of these two oldest Indian medical writers is there any indication of the practice of animal dissection."

The Greeks did not practise dissection of the human body. "The anatomical knowledge of the Hippocratists was derived chiefly from dismemberment of animals, experience in slaughtering and sacrifices, and from the observation of surgical cases. Systematic dissection of the human body was out of the question owing to the religious precepts which strictly enjoined immediate burial, and to the superstitious horror of the dead which then prevailed. The supposition that outstanding individual investigators, upon rare occasions, did not hesitate to examine,

¹ Hoernle. Osteology. Preface. iii-

human bodies or parts of bodies (particularly) bones, in order to correct prevailing opinions, is one which, if not susceptible of direct proof, is at least probable. This supposition, besides being borne out by many statements on the part of ancient writers, is the more probable since the bodies of savages, traitors and criminals were outside the pale of religious ordinances and were therefore available, as were also accidentally obtained portions of the body, to satisfy the curiosity of scientific investigators. No one of the oft-quoted extracts from the Hippocratic writings, supposed by individual historians to refer to human dissection, is quite conclusive, whilst nowhere is there in the pathology of the day any definite trace of anatomical research upon the bodies of those dead of disease. On the other hand comparisons are frequently instituted by the Hippocratists referring to facts acquired through zootomy or to anatomico-pathological discoveries such as might have been made in the slaughtering of beasts.”¹

The study of anatomy received its impetus from the Alexandrian School. “Herophilus improved the technique and developed the terminology of anatomy and enriched it by valuable discoveries made in the dessecction of human bodies, particularly in the knowledge of nerves, vessels and viscera, but also in that of the eye. With his works, systematic anatomical investigation may in fact be said to begin.”²

“Like Herophilus, Erasistratos made a sucessful study of anatomy, even surpassing the former in knowledge of details, and in a series of observations upon the cadavers of men and

¹ History of Medicine. Neuberger. P. 150.

² Ibid. P. 177-8.

animals, corrected his own mistakes as well as those of others. His greatest achievement was in the study of nerves and vessels.”¹

2, 3 AND 4. CRYSTAL, GLASS AND RUBY.

These are recommended to be used for cutting through and cutting into some parts of the body.

Glass vessels for preparing medicines are often mentioned. Sāringadhara² used it for purifying mercury.

5. LEECHES.

Leeches are described to be the mildest of all means for extracting blood, and are recommended for princes, children, women, and timid people³.

Twelve kinds of leeches are described⁴; six of them are poisonous and six, non-poisonous.

¹ History of Medicine. Neuberger. P. 181.

² काचकूप्यां विनिक्षिप्य ताच्च मृद्गसुद्रया ।
विलिप्य परितो वक्त्रं मूद्रां दत्त्वा च शौचयेत् ॥

Sāringadhara Samgraha, II. xii.

³ वृपाश्वालस्थविर भौरदुर्बलनारी सुकुभाराणामनुग्रहार्थं परमसुकुमारोऽयं शोणितावसे च नोपायोऽभिहितो जलौकसः ॥

Suśruta Samhitā, I. xiii.

⁴ जलमासामायुरिति जलायुका जनमासामोक इति जलौकसः । ता व्यादश तासां सविषाः पष्ट् तावत्य एव निर्विषाः । तत्र सविषाः क्षणा कर्वुरा अलगाह्वा इन्द्रायुधा सामुद्रिका गोचन्दना चेति । तोखञ्जनचूर्णवर्णा पृथुशिराः क्षणा । वर्क्षिमत्थवदैत्यता छिन्नोद्ध्रत-कुचिः कर्वुरा । रोमशा महापात्रा क्षणसुख्यलग्नह्वा । इन्द्रायुधवद्युराजिभिश्चिविता इन्द्रायुधा । ईषद्विसितपौतिका विचिव पुष्पाङ्कतिचिदा सामुद्रिका । गोद्वषणवदधोभागे । हिघामृताङ्गतिरण्युमुखी गोचन्दनेति । ताभिर्द्वेषे पुरुषे दंशे श्वयुरतिमावः कल्पमूर्च्छा

The poisonous leeches are :—

1. *Kṛṣṇā* :—it is of the colour of black collyrium and has a broad head.

ज्वरोदाहश्चहिंसदः सदनमितिलिङ्गानि भवति । तत्र महागदः पानालिपननस्य कर्मादियूपयोग्यः । इन्द्रायुधादष्टमसाध्यमित्येताः सविषाः सचिकित्सिता व्याख्याताः । अथ निर्बिषाः । कपिला पिङ्गला शङ्कुसुखी मूषिका पुण्डरीकसुखी सावरिकाचेति । तत्र भनःश्लारजिताभ्यामिव पार्श्वाभ्यां पृष्ठे स्त्रिघंसुद्धवर्णा कपिला । किञ्चिद्रक्ता छत्रकाया पिङ्गलाशुगात्रं पिङ्गला । यक्षदर्शा श्रीप्रपायिनी दीर्घतेच्छासुखी शङ्कुसुखी । मूषिकाकृति वर्णाऽनिष्टगन्धा च मूषिका । सुद्धवर्णा पुण्डरीकतुल्यवक्त्रा पुण्डरीकसुखी । श्रिघ्ना पद्मपत्रवर्णाऽदशाङ्गुलप्रभाणा सावरिका साच वश्वर्थे । इत्येता अविषा व्याख्याताः ।

तासां प्रगृहणमार्द्वचर्मणान्वैवा प्रयोगैर्गृह्णीयात् । अथैनां नवे महति घटे सरक्षडांगोदकपङ्गमावाप्य निदध्यात् । भव्यार्थं चासामूपहरैच्छैवलं बल्लूरमौदकांशं कलदांश्चौक्त्वय श्वर्यार्थं दण्डमौदकानि च पताणि । दग्धान्त्रगृहाच्चान्यज्जलं भव्यच्च दद्यात् । सप्तरात्रात् सप्तरात्राच्च घटमन्यं संक्रामयेत् । भवति चाच ।

स्थूलमध्याः परिक्रिष्टाः पृथ्यो मन्त्रविचेष्टिताः ।

अग्राहिण्योऽत्यपायिन्यः सविषाश्च न पूजिताः ॥

अथ जलौकीकोऽवसेकसाध्यव्याधितसुपवेश संवेश वा विरुद्ध्य चास्य तमवकाशं स्फङ्गेमयचूर्णेयद्यरुजः सप्तात् । गृहीताश्च ताः सर्षपरजनीकल्पोदक प्रदिग्धगात्रोः सलिलसरकमध्ये सुहर्चच्छितविगतक्षमा ज्ञाला ताभीरोगं ग्राहयेत् । सूज्जस्त्रकार्द्वपिचुओतावच्छन्नां क्षत्वा सुखमपार्णुयादगृह्णन्त्यै चौरविन्दुं शोणितविन्दूं वा दद्याच्छस्त्रपदानि वा कुर्वीत यदेवमपि न गृह्णौयात्तदान्यां ग्राहयेत् । यदा च निविश्टेऽश्वमुरवदानान् क्षत्वोन्नत्य च स्तन्वं तदा जातीयाद् गृह्णतीति गृह्णन्तां चार्द्वस्त्रावच्छन्नां धारयेत् सेचयेच । दंशे तोदकन्दुप्रादुर्भावैर्ज्ञानीयाच्छुद्धमियमादत इति शुद्धमाददानामपनयेत् । अथ शोणितगन्धेन न सुच्छेष्टसुखमस्याः सैन्धवचूर्णेनावकिरेत् । अथ पतितां तरुणुलकण्ठनप्रदिग्धगात्रां तैललवण्याभ्यत्तसुखीं वाम-इक्षाङ्गुष्टाङ्गुलीभ्यां गृहीतपुच्छां दचिण्याहस्ताङ्गुष्टाङ्गुलीभ्यां शनैः शनैरनुलोभमनुभार्जयेदासुखादामयेत्तावद्यात् सम्यग्वाललिङ्गानीति । सम्यग्वाना सलिलसरकन्यस्ता भोक्तुकामा सतीचरेत् । या सौदति न चैषते सा दुर्बन्ता तां पुनः सम्यग्वामयेत् । दुर्बन्ताया व्याधिरसाध्याद्यमदो नाम भवति । अथ सुवन्नां पूर्ववत् सन्निदध्यात् शोणितस्य च योगायोगानवेच्चर्जन्तालौकीव्रणान्मधुनावधृतेच्छीताभिरङ्गिश परिषेचयेवन्नीत वा ब्रणं काषाय मधुर स्त्रिघंशीतैश्च प्रदेहैः प्रदिद्वादिति ।

2. Karvūrā :—it is as long as an eel with elevated stripes across the abdomen.

3. Alagarddā :—it looks as if covered with hair and has large sides and black mouths.

4. Indrāyudhā :—or rain-bow coloured; it has rain-bow coloured longitudinal stripes on the back.

5. Sāmudrikā :—it is of dark yellow colour and has variegated flower like spots on its body.

6. Gocandanā :—it has a bifurcated tail like the scrotum of a bull and a small mouth.

The non-poisonous ones are—

1. Kapilā or the greenish one ;—it has its two sides of the colour of orpiment, and on its back, it is smooth and of the colour of a green pea.

2. Pingalā or twany ;—it is of a reddish-brown colour, has a round body and moves quickly.

3. Śaṅku-mukhī or bluish-red ;—it is of the colour of the liver, sucks quickly and has a long sharp mouth.

4. Müṣikā or rat-like ;—it has the shape and colour of a rat's tail and emits a disagreeable smell.

5. Pundarika-mukhi or lotus-faced ;—it is of the colour of a green pea and has a mouth like a lotus.

6. Savarikā ;—it is slimy, coloured green like a lotus-leaf and eight angulil long ; it is to be used in veterinary practice.

The non-poisonous leeches generally live in meadows and fresh water. They are to be caught with a piece of wet leather and

kept in a new large earthen pot filled with mud, water, green fungi, dry flesh, etc. The water is to be changed every third day and the pot every seventh day.

To apply leeches, the patient is directed to lie down and the part is to be rubbed dry with powdered cow dung and earth. The leech is then to be smeared with a paste containing turmeric, mustard and water, to excite them, washed thoroughly with water and then applied, its body being covered with a piece of wet cloth. To fix it quickly, a drop of milk or blood is to be applied over the diseased part, scarification of which is also recommended instead. When the leech has removed the necessary quantity of blood, a small quantity of salt is advised to be sprinkled upon its head to make it drop off. Then the leech is to be put upon some powdered rice and its mouth is advised to be smeared with oil and salt.

Then it is to be stripped and put in fresh water, and should be used again, if it moved, but if languid, thrown away.

The leech-bites are to be smeared with honey, cold water and astringent substances, or poulticed.

Vāgbhaṭa also gives similar directions for the application of leeches.¹

¹ जलौकसन्तु सुखिनां रक्तस्वावाय योजयेत् ।
दुष्टान्वमत्स्यं भेकाहि शवक्रीथमलोहवाः ।
रक्ताः श्रेता भृशं क्षण्णाशपलाः स्थूलपिच्छिलाः ॥
इन्द्रायुधविचिलोऽङ्गराजयो रोमशाश्व ताः ।
सविषा वर्जयेत्तामिः कण्डुपाक ज्वरभमाः ॥
विषपित्तास्वनुत् कार्यं तद शुद्धान्वुजाः पुनः ।
निर्विषाः शैवलश्यावा बृता नौर्लिंगराजयः ॥

Dr. Ray has clearly shown that "the description of leeches as given by Rhazes agrees almost word for word with that of Suśrata (Sanasrad) in many places". He describes the parallelism at length and comes to the conclusion "of the use of a chapter of the Susruta or some such work¹".

6 AND 7. FIRE AND CAUSTICS.

The use of cauteries in surgery has been described before under the head of the accessory blunt instruments².

कषाय पृष्ठासन्वज्ज्ञः किञ्चित् पौत्रदराश्च याः ॥
 ता अप्यसम्यग् वमनात् प्रतवच्च निपातनात् ।
 सीदन्तीः सलिलं प्राप्य रक्तमत्ता इति व्यजेत् ॥
 अथेतरा निशाकल्क युक्तेऽभ्यसि परिषुताः ।
 अवन्तिसोमे तक्रेवा पुनश्चाश्वासिता जर्वे ॥
 लागयेद् घृतमृत्खाङ्गं शस्त्रं रक्तं निपातनैः ।
 पिवन्तीरुद्रहत् स्त्रान्वाञ्छादयेन्मृदुवाससा ॥
 संपृक्ताङ्गुष्टं शुद्धासाज्जलौका दुष्टशोणितम् ।
 आदत्ते प्रथमं हंसः चौरं चौरीदकादिव ॥
 दंशस्य तोदे कर्खुं वा मोचयेद्वामयेच्च ताम् ।
 पटुतैलाक्तवदनां श्वक्षणं कर्णेन रुचिताम् ॥
 रक्तन् रक्तमदाद् भुयः सप्ताहं वा न पातयेत् ।
 पूर्ववत् पटुता दाश्च सम्यग् वान्ते जलोकसाम् ।
 क्लमोऽतियोगाम्बृत्युर्वा दुर्बान्ते स्त्रवता भदः ॥
 अन्यतान्यत ताः स्थाया घटे मृत्खाम्बुगभिनि ।
 लालादिकोथ नाशार्थं सविषाः सुरालदन्वयात् ॥
 अशुद्धौ स्वावयेद्वशान् हरिद्रा गुडमत्तिकैः ।
 शतधौताज्यपिचवस्तो लेपाश शैतलाः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

¹ History of Hindu Chemistry, Introduction P. lxviii,

² See Page 213-9,

8 AND 14. FINGERS AND NAILS.

The uses of surgeon's fingers and nails in surgical operations has been described before¹.

9,10 AND 11. LEAVES.

Rough leaves such as those of Fig trees (*Ficus Indicus*), Goji (*Elephantopus Seaber*), Śephālikā (*Nyetanthes Arbor-tristis*) and Śaka (*Tectonia Grandis*) are recommended for scarifying abscesses if they do not heal up after repeated opening by the knife. If there is any formation of pus in the mouth or eyelids, it may be evacuated with these leaves (*Susruta*)². These leaves are also to be used for bleeding the gums in gingivitis.

To cover the wounds, Suśruta gives a list of leaves to be used according to the nature of the wound and season of the year³ :—

For air-deranged wounds ;—use leaves of Eranda (*Ricinus Communis*), Bhūrjapatra (*Betula Bhojpatra*), Pūtika (*Caesalpinia Bonducella*) and Haridrā (*Cureuma Longa*).

¹ See Page 199-202, and 204-5.

² संशोध्यभयतः कार्यं शिरशोप कुर्शे तथा ।
काकोडुम्बरिका गोजीप्रदेविंसावयेदस्त्क् ॥

Suśrutā Samhitā, IV. xxii.

³ एरण्ड भूर्जपूतीक हरिद्राणान्तु वातजे ।
पञ्चमाश्ववल्यं यच्च काश्मरी पदमेव च ॥
पताणि चौरब्लृचाणामौदकानि तथेव च ।
दूषिते रक्तपित्ताभ्यां ब्रणे दद्याहिचच्चयः ॥
पाठामूर्खागुडूचैनां काकमाचौहरिद्रयोः ।
पवच्च शुक्लाणाशाया योजयेत् कफजे ब्रणे ॥

Ibid, IV. i.

For bile or blood-deranged wounds;—use leaves of Āśvabala (Basella Rubra), Kāśmarīpatra, (Gmelina Arborea), Vata (Ficus Bengalensis) and Kumuda (Nymphae Lotus).

For phlegm-deranged wounds—use leaves of Pāṭhā (Cissampelos Hexandra), Mūrvā (Sansevieria Zeylanica), Guḍuci (Tinospora Cordifolia), Kākamācī (Solanum Nigrum), Haridrā (Curcuma Longa) and Śuknāśā (Oroxylum Indicum).

For similar purpose Caraka¹ recommends us to use the leaves of Kadamba (Anthocephalus Cadamba), Arjuna (Terminalia Arjuna), Nimva (Azadirachta Indica), Pātālī, Pippala (Ficus Religiosa) and Arka (Calotropis Gigantea).

The leaves of the padma or nymphæ are to be used for handling the eyeballs and the intestines, to replace them in their proper position when prolapsed by injury² (Suśruta) Caraka recommends lotus leaves and plantain leaves as coverings to the bleeding piles,³ Cakradatta⁴ mentions the use of

¹ कदम्बार्जुननिम्बानां पाटल्याः पिपलसर च ।
ब्रण प्राच्छादने विहान् पवाण्यकसर चादिशेत् ॥

Caraka Saṁhitā, VI. xiii.

² भिन्नं नेव मकरम्भग्यमभिन्नं लक्ष्यते तु यत् ।
तन्निवेश्यथयाम्यानमव्याविष्टश्चिरं श्वनः ।
पौड्येत् पाणिना सम्यक् पद्मपवान्तरेण तु ॥

Suśruta Saṁhitā, IV. ii.

³ कदलीदलेरभिनवैः पुक्कर पतेष शीतजलसिक्तौः ।
प्रच्छादनं सुहम्मुहरि इ पझोतपलदलैश्च ॥

Caraka Saṁhitā, VI. ix.

⁴ गोजीशफालिका पवैरर्जः संलिख्य लिपयेत् ।
चारेण वाक्शत् तिष्ठद्य घन्वङ्गारं पिधाय च ॥

Cakradatta, Arā Saṁhitā.

Gojī and Šephālikā leaves for scratching the piles before the application of caustics to them. He also directs us to rub the small tumours with the rough leaves before the application of various ointments.¹ Šivodāsa also mentions the use of such leaves for rubbing the eyelids in the pillva disease.² Suśruta³ mentions the use of rough leaves for scratching any part.

Paul⁴ mentions the use of fig leaves, for rubbing down the hard granulations of granular lids.

12. YOUNG STEMS OF PLANTS.

The young shoots are described to have served the purpose of a probe. Caraka⁵ calls them the soft variety, the metallic ones being called the hard probes. These shoots are to be used for superficial sinuses. Suśruta directs us to use the young shoots

¹ विष्ट्रय चोडुव्वरशाकगोजी-
पतेभूशं चौद्रयुतैः प्रलिम्पेत् ।

Cakradatta, Granthyavuda Cikitsā.

² वर्त्मावलिखं वहुशस्त्रच्छोणितमोच्चाम् ।
पुनः पुनर्विरेकच्च पिल्लरोगातुरो भजेत् ॥

Cakradatta, Netraroga Cikitsā.

वत्वांवलिखमिति । कर्कशशाखोटकादि पतेण वर्त्मघषेणम् ।

Tattva Candrikā, Ibid.

³ चौमं झोतं पित्तुं फेनं यावश्यकं ससैन्धवं ।
कर्कशानि च पवाणि लिखनार्थं प्रदापयेत् ॥

Suśruta Saṁhitā. IV, i.

⁴ Paul, III. xxii.

⁵ See foot-note 4. P. 269.

of the pot-herbs called Cuñca and Upādikā (Basella Rubra) as probes in sinuses on the eyelids and arround the anus.¹

If in young people the teeth become loose as the result of some injury, the patient should be directed to live upon milk only, sucking it through the stalk of lily; and thus affording the teeth rest and a chance of being firmly fixed again.²

To excite emesis, Sāringadhara,³ advises us to introduce a tube of Eranda (Ricinus Communis) into the throat of the patient. The vomiting is also said to have been excited by thursting a finger or a stalk of lily down the throat.

¹ नाड़ी व्रणान् श्ल्यगर्भानुमार्युत्सङ्गिनः शैः ।
करिरवालांगुलिभिरेषणा वैषयेहिषक् ॥
नेचवर्क्षं गुंदाभासनादीडवक्त्राः शशीणिताः ।
चुञ्चुपोदकजैः शक्ताः करीरेषयेऽनुताः ॥

Suśruta Saṁhitā, IV. i.

² अभग्नाश्लितान्दनान् सरक्तानवपीडयेत् ।
तरुणस्य मनुष्यस्य शीतैरालिपयेइहिः ॥
सिद्धान्बुभिस्तः शितैः सम्वानीयैरुपाचरेत् ।
उत्पलस्य च नालिन च्छीरपानं विघ्नीयते ॥

Suśruta Saṁhitā, IV. iii.

³ अजीर्णं कोण्ठपानीयं सिम्भु पीत्वा वमेत् सुधोः ।
वमनं पायथित्वा च जानुमाचासने स्थितम् ॥
कण्ठभेरण्डनालिन स्पृश्न्तं वासयेहिषक् ।
लन्ताटं वमतः पुंसः पाश्वौ द्वौ च प्रवोधयेत् ॥

Sāringadhara Saṅgraha, III. iii,

CHAPTER VIII.

HYGIENIC APPLIANCES AND HOSPITAL REQUISITES.

TOOTH-BRUSH.

The ancient Hindus used branches of trees as tooth-brush. They should have the length of twelve aṅguli and the circumference equal to that of the little finger. Suśruta directs us to use a straight and plain branch of such trees as have an astringent, or sweet, or bitter, or sour taste¹. Amongst these classes of trees, the twigs of Khadira (*Acacia Catechu*), Madhuka (*Brassia Latifolia*), Nimva (*Melia Azadirachta*), Karñja (*Pongamia Glabra*) are the best. The end of the stick is to be chewed first to form a brush and the teeth are then to be rubbed with it. He recommends us to use some tooth-powder.²

¹ तवादौ दन्तपवन ददशाङुल मायतं ।

कनिष्ठिका परिणाह सूज्वयथितमन्त्रणं ॥

अयुग्मयनि यज्ञापि प्रलयं शस्तभूमिजं ।

अवेत्यत्तुच दोषच रसं वीर्यच योजयेत् ॥

कषायं मधुरं तिक्तं कटुकं प्रातरुत्थितं ।

निष्वश तिक्तके श्रेष्ठः कषाये खदिरस्तथा ।

मधुको मधुरे श्रेष्ठः करञ्जः कटुके तथा ॥

Suśruta Samhitā, IV. xxiv

² चौद्र व्योष विवर्गाकं सतैलं सैन्धवेन च ।

चूर्णेन तेजोवत्याश दन्तान्त्रियं विशोधयेत् ॥

एकैकं घर्षयेद्दन्तं मृदुना कूर्चकेन च ।

दन्तशोधनं चूर्णेन दन्तमांसन्यवाधयन् ॥

Bhāvamīśra mentions the names of other trees which may be used for the purpose,¹ and also gives us a list of trees to be avoided.² The use of the tooth-brush is contra-indicated in the various diseases of the mouth, ears, &c.³ Caraka⁴ advises us to use the tooth-brush twice a day.

- १ उक्तं वीर्यं वटे दीपिः करञ्जे विजयो भवेत् ॥
 प्लके चैवार्थसम्पत्तिर्वदर्थां मधुरोधनिः ।
 खदिरे सुखसौगम्यं विवेतु विपुलं धनम् ॥
 उदुम्बरे तु वाक्सिद्विरामेलारीग्न्यमेव च ।
 कदम्बे तु धृतिर्मधा चम्पके च छटामतिः ॥
 शिरौषे कौर्त्तिमौभाग्य मायुरारोग्यमेव च ।
 अपामार्गे धृतिर्मधा प्रज्ञाशक्तिस्तथाध्वनिः ॥
 दाढ़िम्बां सुन्दरकारः ककुमे कुटजे तथा ।
 जातीतगरमन्दरैर्दुःखप्रब्लृ विनश्यति ॥

Bhāva Prakāśa, I. i.

- २ गुवाकसालहिन्नालौ केतकच्च छहतृण ।
 खर्जुरं नारिकेरच्च सरैते लण्णराजकाः ॥
 लण्णराज समृत्यन्नं यः कुर्याद् दन्तधावनम् ।
 नरशारङ्गाल योनिः स्याद्यावङ्गान्नं पश्यति ॥

Ibid.

- ३ नखादेद्वगलताल्लोष्ट जिह्वारोग समुडवे ॥
 अथास्यपाके श्वासेच कासहिका वमीषु च ।
 दुर्वलो जीर्ण भक्तश्च मूर्च्छार्चोर्मदपीडितः ॥
 शिरोरुगार्त्तसृष्टिः शान्तः पानकमान्वितः ।
 अद्विती कर्णशूलीच दन्तरोगोच मानवः ॥

Suśruta Saṁhitā, IV. xxiv

- ४ आपोथिताग्नं हौ कालौ कषायं कटुतिक्तकम् ।
 भक्षयेद्वन्नपवनं दन्तमांसान्यवाधयन् ॥
 निहन्ति गम्बवैरस्य जिह्वादन्तास्यजं मलम् ।
 निष्कृष्ट रुचिमाधत्ते सद्यो दन्तविशेषधनम् ॥

Caraka Saṁhitā, I. v.

Suśruta mentions the use of a tooth-brush to extract a fish-bone from the throat.¹

After cleansing the mouth with water after meals, I'Tsing ordains² "Chew tooth-wood in the mouth; let the tongue as well as the teeth be carefully cleaned and purified." Again he says: "It is surely not seemly for any one to spend his time after meals chaffing and chattering, nor is it right to remain impure and guilty all day and night, without preparing water in a clean jar or without chewing a tooth-wood."

He continues³: "Every morning one must chew tooth-woods, and clean the teeth with them, and rub off the dirt of the tongue as carefully as possible. Only after the hands have been washed and the mouth cleansed is a man fit to make a salutation; if not, both the saluter and the saluted are at fault. Tooth-wood is Danta-kāṣṭha in Sanskrit—danta, tooth, and kāṣṭha, a piece of wood. It is made about twelve finger-breadths in length, and even the shortest is not less than eight finger-breadths long. Its size is like the little finger. Chew softly one of its ends, and clean the teeth with it. If one unavoidably come near a superior, while chewing the woods, one should cover the mouth with the left hand.

Then breaking the wood, and bending it, rub the tongue. In addition to the tooth-wood, some tooth-picks made of iron or copper may be used or a small stick of bamboo or wood, flat as the surface of the little finger and sharpened on one

¹ सृदुना वा दलधावनकूच्चिनापहरेत् ।

Suśruta Saṃhitā, I. xxvii.

² I'Tsing. Records of the Buddhist Religion.—Takakusu. P. 26-7.

³ Ibid. ch. viii. Use of Tooth-woods. P. 33.

end, may be used for cleaning the teeth and tongue ; one must be careful not to hurt the mouth. When used, the wood must be washed and thrown away.

Whenever a tooth-wood is destroyed, or water, or saliva is spit out, it should be done after having made three fillips with the fingers or after having coughed more than twice ; if not, one is faulty in throwing it away. A stick taken out of a large piece of wood, or from a small stem of a tree or a branch of an elm, or a creeper, if in the forest ; if in a field, of the paper mulberry, a peach, a sophora japonica (*Huai*), willow tree, or anything at disposal, must be prepared sufficiently beforehand. The freshly cut sticks (lit. wet ones) must be offered to others, while the dry ones are retained for one's own use.

The younger priest can chew as he likes, but the elders must have the stick hammered at one end *and made soft* ; the best is one which is bitter, astringent or pungent in taste, or one which becomes like cotton when chewed. The rough root of the Northern Burr-weed (*Hu Tai*) is the most excellent ; this is otherwise called *Tsâng-urh* or *Tsae-urh*, and strikes the root about two inches in the ground. It hardens the teeth, scents the mouth, helps to digest food, or relieves heart-burning. If this kind of tooth-cleaner be used, the smell of the mouth will go off after a fortnight. A disease in the canine teeth or toothache will be cured after a month. Be careful to chew fully and polish the teeth cleanly, and to let all the mouth-water come out ; and then to rinse abundantly with water. That is the way. Take in the water from the nose once. This is the means of securing a long life adopted by Bodhisattva *Nâgârguna*. If this be too hard to put in practice, to drink water is

also good. When a man gets used to these practices he is less attacked by sickness. The dirt at the roots of the teeth hardened by time must all be cleaned away. Washed with warm water, the teeth will be freed from the dirt for the whole of life. Tooth-ache is very rare in India owing to their chewing the tooth-wood."

TOOTH-PICK.

Suśruta advises us to use sticks of grass as tooth-pick after meals to extract particles of food lodged between the teeth, otherwise these will decompose and the mouth would be smelling badly.¹ Bhāvamīśra gives similar directions but adds that if any particles of food cannot be easily extracted by the tooth-pick, one must not use any force to extract them.² "After eating they cleanse their teeth with a willow stick, and wash their hands and mouth."³

JIHVĀ NIRLEKHANA OR TONGUE SCRAPER.

Suśruta says : "To scrape the tongue, a golden, or silver, or

¹ दन्तान्तरगतं चान्नं शोधनेनाहरेच्छनैः ।

कुर्यादनाहृतं तद्वि सुखस्थानिष्टगन्धतां ॥

Suśruta Samhitā, I. xlvi.

² एवं भूक्ता ममाचामेद्युक्तयहय पूर्वकम् ।

भीजने दन्तलग्नानि निर्हृत्याचमनं चरेत् ॥

दन्तान्तरगतं चान्नं शोधनेनाहरेत् शनैः ।

कुर्यादनिर्हृतं तद्वि सुखस्थानिष्ट गन्धताम् ॥

दन्तलग्नमनिर्हृयं लेपं मन्येत् दन्तवत् ।

न तत्र वहुशः कुर्याद् यत्रं निर्हरणं प्रति ॥

Bhava Prakasa, I. i.

³ Beal's Records of the Buddhist Religion. Trans. from Hiuen Tsiang, vol. I, p. 77.

wooden scraper is to be used. It should be ten aṅguli long and must be pliant and polished”¹. Caraka² mentions tongue-scraper of copper, lead or brass. Bhāvamisra³ also gives a similar discription. It is to be used for scraping the deposit on the tongue. It is still commonly used in India.

RAZOR AND SHEARS. THE PRACTICE OF SHAVING.

Every one is recommended by Suśruta to have his beard shaved, hair trimmed and nails pared.⁴ Caraka⁵ also advises

¹ जिह्वानिर्लेखनं रौप्यं सौवर्णं वार्द्धमेव च ।

तन्मलापहरं शस्त्रं मटुश्चक्ष्य दशाङ्गुलं ॥

Suśruta Saṁhitā, IV. xxiv.

² सुवर्णरूप्यताभाष्य वपुरौतिमयानि च ।
जिह्वानिर्लेखनानि सुरतीच्छान्वद्यजूनि च ॥
जिह्वामूलगतं यच्च मलमुक्तासरोधि च ।
सौगन्धं भजते तेन तस्माजिह्वां विनिर्लिखेत् ॥

Caraka Saṁhitā, I. v.

³ जिह्वानिर्लेखनं हैमं राजतं ताम्बरं तथा ॥
पाटितं मटु तत् काष्ठं मटुपत्रमवं तथा ।
“तत् काष्ठं” दलशोधनयोग्यं काष्ठम् ।
दशाङ्गुलं मटु स्त्रिघ्यं तेन जिह्वां लिखेत् सुखम् ।
तज्जिह्वा मलवैरस्य दुर्गन्धं नडता हरम् ॥

Bhāva Prakāśa, I. i.

⁴ पापोपशमनं केशनखरोमापमार्जनं ॥
हर्षलाघव-सौभाग्य-करमुत्साह वर्जनं ।
वाणवारं मजावर्णं तेजोवलं विवर्णं ॥

Suśruta Saṁhitā, IV. xxiv.

तवादित एव नीचनखरोमा * *

Ibid.

⁵ पौष्टिकं छष्मायुष्यं शुचिरूपविराजनम् ।
केशश्शमशुनगद्वादीनां कल्पनं संप्रसाधनम् ॥

Caraka Saṁhitā, I. v.

us to shave regularly, that is thrice in a fortnight.¹ Bhāvamīśra says that this practice conduces to health, beauty, longevity and purity, and should be observed every fifth day². Razor is mentioned in the R̄gveda³ and in the Kaṭhopaniṣad of the White Yayu.⁴ In the Śatapatha Brāhmaṇa, we find the method of shaving well described.⁵ “Then (in shaving) are used a porcupine quill spotted in three places and a copper razor; that three-spotted porcupine’s quill resembles the three-fold science and the copper razor resembles the Brāhmaṇa; for Brahmā is fire, and fire is of reddish (lohita) colour, hence a copper (loha), razor is used”.

Again we read⁶ :—“For impure, indeed, is that part of man where water does not reach him. Now at the hair and beard, and at the nails the water does not reach him; hence when he shaves his hair and beard, and cuts his nails, he does so in order that he may be consecrated after becoming pure.

¹ विः पचस्य केशश्मशुलोमनखान् संहारयेत् ।

Carakas Saṁhitā, I. viii.

² पञ्चरात्राद्वय इमशुकेशरीमाणि कर्त्तव्येत् ।

केशश्मशु नखादीनां कर्त्तनं सम्प्रसाधनम् ।

पौष्टिकं धन्यमायुष्यं शौचकान्तिकरं परम् ॥

“सम्प्रसाधनम्” शोभाजनकम् ॥

Bhāva Prakāśa, I. i.

³ सं नः शिशौहि भुरिजोरिव चुरंरास्त्ररायो विमोचन ।

R̄gveda, 8 M. 4 S. 5 A. 7 A. 16 V.

⁴ क्लूस्य धारा निश्चिता दुरव्यय दुर्गम्यथस्तु कवयो वदन्ति ।

Kaṭhopaniṣad, I. iii.

⁵ Śatapatha Brāhmaṇa, II. 6. 4. 5.

⁶ Ibid. 111. 1.2.2.

3. Now some shave themselves all over, in order that they may be consecrated after becoming pure all over; but let him not do this. For even by shaving the hair of his head and his beard, and by cutting his nails he becomes pure; let him therefore shave only the hair of his head and his beard, and cut his nails.

4. In the first place he cuts his nails, first of the right hand, for in human (practice) those of the left hand (are cut) first, but with the gods in this manner. First he cuts those of the thumb—for in human practice those of the little fingers are cut first, but with the gods in this manner.

5. He first passes (the comb) through his right whisker—for in human (practice) they comb) first the left whisker, but with the gods in this manner.

6. His right whisker he moistens first with the text “may this divine water be propitious unto me”.....

Thereupon he lays a stalk of sacrificial grass on (the hair of the whisker) with the text “O plant, protect me”..... Thereto he applies the razor, with the text “O knife, injure him not”.

8. Having cut off (part of the stalk and hair), he throws it into the vessel of water. Silently he moistens the left whisker; silently he lays the stalk of grass on it; and having silently applied the razor thereto and cut through (it and the hair) he throws them into the vessel of water.

He then hands the razor to the barber, and the latter shaves off the hair and beard. When he has shaved the hair and beard.....

10. He bathes.....

12. He steps out (from the water) towards the north-east, with the text “cleansed and pure I go forth from them;”.....

13. He then puts on (a linen) garment etc.”

“The Atharva-veda relates how, when the ceremony of shaving off his beard was performed on king Soma, Váyu brought the hot water and Savitri skillfully wielded the razor.”¹

In para. 3, quoted above, we have evidence of the practice of depilation of the pubes which is here forbidden. There are six important rules and six minor rules of ordination for the female members or Śrāmaneris of the Buddhist order. One of the six minor rules is : A female must not shave the hair in any place but the head.² “Aristphanes, a contemporary of Hippocrates,³ Persius⁴ and Juvenal⁵ refers to the depilation of the pubes as being common among certain classes, and the early Christian Fathers deplore the practice. See also the remarks of Seutonius on the conduct of Domitan”⁶. Prosper Alpinus (16th century) “found the custom still prevalent among the Egyptian women”⁷. “The custom survived in France, and Italy in the 16th century”⁸.

KESA PRASADHANI OR COMB.

Suśruta directs us to comb the hair to free the head from dust,

¹ Macdonnel's Sanskrit Literature, p. 164.

² See I'Tsing, P. 97, Foot-note 3. Vinaya Samgraha. Chap. xii.

³ Hippocrates, Ran. 516, Lys 89, 151.

⁴ Persius, iv. 37.

⁵ Juvenal, vii. 114.

⁶ Seutonius, xxii.

⁷ Medicina Aegyptiorum, 111. xv.

⁸ Milne, Surgical Instruments &c., p. 90-91.

louse and dandruff.¹ Bhāvamīśra advises us to comb the hair every day to keep it clean, as it stimulates the growth of hair.² Caraka³ also recommends us to keep the hairs clean. The practice of combing the hair is very ancient; the Atharva-veda mentions a comb with a hundred teeth.

LOOKING-GLASS.

The looking-glass should be constantly used as thereby the complexion is said to be improved and life prolonged⁴. For an account of the looking-glass of the ancient Hindus, see Mitra's Indo-Aryans⁵.

DRESS.

Silk, chintz and red clothes are good for the winter, for they are said to be useful for derangement of air and phlegm. Thin silk is cooling and is efficacious for biliary disorders; so it should be used during the summer. It should be coloured twany or red. White clothes are auspicious and are neither hot

¹ केशप्रसाधनीं केशा रजोजन्तु मलापहा ।

Suśruttā Saṁhitā, IV. xxiv.

² केशपाशे प्रकृत्यैति प्रसाधन्या प्रसाधनम् ।

केश प्रसाधनं केशं रजोजन्तु मलापहम् ॥

Bhāva Prakāśa, I. i.

³ साधूविशः प्रसाधितकेशो * *

Caraka Saṁhitā, I. viii.

⁴ आदर्शलोकनं प्रोक्तं माङ्गल्यं कान्तिकारकम् ।

पौष्टिकं वल्यमायुष्यं पापलच्छी विनाशनम् ॥

Bhāva Prakāśa, I. i.

⁵ The Indo-Aryans Vol. 1, p. 240.

nor cold; therefore they should be worn during the rains¹. Caraka says that pure dress conduces to longevity, happiness and fortune².

UṣṇīṣA OR HEAD DRESS.

Suśruta³ advises us to use a cap on our head which is thus protected from injury. Bhāvamīśra says that the habitual use of some form of covering for the head stimulates the growth of hair, increases beauty of the head and protects it from dust, draughts and accumulation of phlegm. Only light caps should be used as the heavy varieties derange bile and cause diseases of the eyes.⁴ For the diagrams of the various forms of turbans used by the ancient Hindus, see Mitra's Indo-Aryans.⁵

१ कोशीयौर्णिक वस्त्रञ्च रक्तवस्त्रन्थैव च ।
बातम्भेष्य हरन्तु शीतकाले विधारयेत् ॥
“कोशीयं” पदान्वरं च सर्ववस्त्रञ्च ।
मेघं सूशीतम्भित्तम्भं कषायं वस्त्रमुच्यते ।
तद्वारयेदुष्णकाले तवापि लघु शस्यते ॥
कषायङ्गोकटी इति लोके, कषाय रागरक्तं वा ।
शुक्रन्तु शुभदं वस्त्रं शीतातप निवारणम् ।
नचोष्णन्नचवा शौतन्तु वर्षासु धारयेत् ॥

Bhāva Prakāśa, I. i.

२ काम्यं यशस्यमायुधमलच्छीम्नः प्रहृष्टणम् ।
श्रीमत् पारिषदं शस्तं निर्मलान्वरधारणम् ॥

Caraka Samhitā, I. v.
Bhāva Prakāśa, I. i.

३ पवित्र केशमुखीषं वातातपरजोऽपहं ।

Suśrūta Samhitā, IV. xxiv.

४ उच्चीयं क्षान्तिकृतकैश्यं रजोवात् कफापहम् ।

लघु तच्चस्यते यस्माद् गुरु पित्ताविरोगहात् ॥

Bhāva Prakāśa, I. i.

५ The Indo-Aryans, Vol. I, p. 220.

CHATRA OR UMBRELLAS.

Suśruta says: Umbrellas are useful for protecting men from the rains, draughts, glare of the sun, exposure to cold, and dust. They are auspicious and are beneficial to the eyes¹. Caraka² advises us to use it as it protects us from the sun, rain &c. Bhāvamīśra³ also describes its efficacy similarly. Umbrella is one of the insignia of royalty in India, and is always held over the heads of kings as shown in the Sanchi and Amarāvatī sculptures⁴. It is still commonly used in India.

YASTI OR STICKS.

Caraka⁵ directs us to use a stick as a support. Suśruta says: "By using sticks, a man gains in strength, prowess and manliness. He becomes courageous, patient and forbearing. He can stand erect and is not troubled by any fear"⁶. It

¹ वर्षानिलरजीघर्म्मं हिमादीनां निवारणं ।

वर्षा च चुष्ट भौजस्य शङ्करं कृत्वधारणं ॥

Suśruta Saṃhitā, IV. xxiv.

² ईतेविधमनं वल्य गुप्तावरणशङ्करम् ।

घर्म्मानिलरजोऽनुच्छ इत्वधारणसुच्यते ॥

Caraka Saṃhitā, I. v.

³ कृत्वध धारणं वर्षातपवात रजोऽपहम् ।

हिमन्नं हितमत्योथ साङ्ख्यसपि कौरिंतम् ॥

Bhāva Prakāśa, I. i.

⁴ See Indo-Aryans, 1, p. 266.

⁵ खलतः संप्रतिष्ठाने शत्रुशास्त्रं निसृदनं ।

अवष्टमनमायुषं भयन्नं दख्खधारणम् ॥

Caraka Saṃhitā, I. v.

⁶ शूनः सरोद्धपव्याल विषाणिभ्योभयापहं ।

अमखलन दोषद्वा ख्विरिच प्रशस्यते ॥

सत्त्वोत्ताहवलस्त्वैर्थं चैर्थवीर्यं विवर्जनम् ।

अवष्टमकरञ्जापि भयन्नं दख्खधारणं ॥

Suśruta Saṃhitā, IV. xxiv.

protects a man from dogs, snakes &c. Bhāvamīśra¹ apparently quotes these verses from Suśruta.

UPĀNAHA OR SHOES.

The ancient Hindus used two kinds of shoes, made of wood and leather. The wooden pādukā is recommended to be used before and after dinner². The good effects claimed by its use are, an increase of the power of vision, strength and longevity.³ When travelling, the upānaha or leather shoes are to be used. Besides the advantages mentioned above, shoes are very comfortable to the travellers and prevent many diseases of the feet⁴. If any one often travels barefooted, he feels out of sort, his senses fail, vision becomes impaired and his expectation of life is reduced.⁵

¹ Bhāva Prakāśa, I. i.

² पादुकारोहणद्वयात् पूर्वं भोजनतः परम् ।
पादरोग हरं हृष्टं चचुष्यचायुषी हितम् ॥

Bhāva Prakāśa, I. i.

³ चचुष्यं स्यर्जनहितं पादवीर्यसनापहम् ।
बलं पराक्रमसुखं हृष्टं पादवधारणम् ॥

Caraka Saṁhitā, I. v.

⁴ पादरोगहरं हृष्टं रक्तोन्न ग्रीविवैनं ।
सुखप्रचारमीजसं सदापादवधारणं ।
अनारोग्य मनायुष्मं चक्षुषोरूपघातकात् ।
पादाभ्यामनुपानज्ञां सदा चंक्रमणं नृणां ॥

Suśruta Saṁhitā, IV. xxiv.

⁵ उपानज्ञारणं नेवमायुष्मं पादरोगहत् ।
सुखप्रचारमोजसं हृष्टं परिकीर्तितम् ॥
पादाभ्यामनुपानज्ञां सदा चंक्रमणं नृणाम् ।
अनारोग्य मनायुष्मनिन्द्रियन्न मट्टिदम् ॥

Bhāva Prakāśa, I. i.

The Hindus wore sandals like the ancient Greeks. They also used boots, which look like the modern boots used by Europeans. Buddha gave the Bhikkhus permission to wear boots or shoes, with thick lining¹. Hiuen Tsiang² says that "here (Avanti) Tathagatha gave permission to the Bhikkhus to wear kih-fu-to (boots)." For an account and figures of ancient boots used by the Hindus, see Indo-Aryans.³

VYĀJANĪ AND CĀMARA. THE FAN.

The fan was used for airing the patients to drive away flies.⁴ Suśruta mentions the cāmara *i.e.*, the tail of the Thibetan yolk (*Bos grunnius*) to be used as a fan. "It soothes the inflammation of boils and also acts as a fly-brush to prevent infection of the open wound"⁵. The cāmara is also one of the insignia of royalty and as such we have many representations of it in the sculptures of ancient India⁶. For diagrams of the ancient fan, see Indo-Aryans⁷.

Caraka directs us to use a kulā or fan to winnow corn, prepared from the kāśa (*Saccharum Spontatum*) to resuscitate a still-born child⁸.

¹ *Mohāvagga*, varga 13 ff 6. S. B. E. vol. xvii. p. 35.

² Beal's Records of Buddhist Religion, vol. II. p. 280.

³ Indo-Aryans, Vol. I, p. 123-6.

⁴ वालव्यनन् मौजस्यं मचिकादीनपोहति ।

शोषदाह अमरवेद मूक्षाप्नो व्यजनानिलः ॥

Suśruta Samhitā, IV. xxiv.

⁵ व्यज्येत वालव्यनैर्ब्रणं न च विषद्येत् ।

Ibid., I. xix.

⁶ See Indo-Aryans, vol. II, p. 267-70.

⁷ For diagrams, see Indo-Aryans, vol. I, p. 263.

⁸ तथा संक्षेशविहतान् प्राणान् पुनर्लभेत् कृषकपालिकाश्रेष्ठं चैनमभिः निष्पुनीयाद् धन्त्वा स्थान् यावत् प्राणानां प्रयागमनं तत्तत्सर्वमेवकुर्यात् ॥

Caraka Samhitā, IV. viii.

Bhāvamīśra¹ mentions fans made of the following materials:— palm leaf, bamboo, yolk's tail, cloth, peacock's feather and cane. He attributes peculiar properties to each fan.

Rājavallabha says² that “the palm-leaf fan overcomes disturbances of all the three humours, and is light and agreeable; the bamboo fan causes heat and irritability, and promotes inordinate secretion of the two humours—air and bile; the cane, cloth and peacock's feather fans, overcome disturbances of the three humours; the hair fan is invigorating etc.”

The Buddhist Bhiksus used the palm-leaf fan. “Not unfrequently there is added a lotus-leaf shaped fan, made from a single frond, with an edging of bamboo or light wood, and furnished with a haandle fashioned like the letter “S”. The palm from which the leaf is taken, is also that used for the mss., namely the Talipot; hence the name Talponi given to the Bhikkhus by the early Portuguese adventurers in Burma. When he attended a meeting at which women are likely to be present, every Bhikkhu must have the fan.”³

¹ व्यजनस्यानिलो दाह रवेदमूर्च्छा शमापहः ।

तालबृन्तभवी वातस्त्रिदोषशमको मतः ॥

वंशव्यजनजस्तुषो रक्तपित्तप्रकोपणः ।

चामरो वस्त्रसम्भूतो मायूरो वेवजस्था ॥

एते दोषजिता वाताः स्त्रिधा हृद्याः सपूजिताः ॥

Bhāva Prakāśa, I. i.

² तालव्यजनगुणः—क्रिदोषशमनत्वम् । लघुत्वं ॥ वंशव्यजनगुणः—रुक्तत्वम् ।

उच्चात्म । वायुपित्तकारित्वम् ॥ वेववस्त्रमयूरपुच्छव्यजनगुणः—चिदोषनाशित्वम् ।

वालव्यजनगुणः—तेजस्तरत्वम् । मचिकादि निवारकत्वम् ।

Rājavallabha.

³ The Way of Buddha, p. 53-54.

FILTERS.

Filters were used by the Hindus and are recommended to be made of an earthen or metallic vessel, the mouth being closed by a piece of cloth tied round its neck.

If the water be filthy, Suśruta¹ advises us to purify it by boiling it or by exposure to the sun; or by throwing hot iron balls, sand or clay balls into the water and then allowing it to cool. Such purified water should be scented with the flowers of Nāgakeśara (*Mesua Ferrea*), Campaka (*Michelia Champaca*), Utpala (*Nymphaea Stellata*) and Patala (*Bignonia Snaveoleus*).

Suśruta mentions seven means of purifying polluted water², viz.,

1. Kataka phala or nirmālāya or seeds of *Strychnos Potatorum*.
2. Gomedaka or a kind of gems.
3. Viṣagranthi, or root of *Nelumbium Speciosum*.
4. Śaivālamūla or root of *Vallisneria Spiralis*.
5. A piece of cloth.
6. Pearls.
7. Precious Stones and crystals.

¹ व्यापनानामग्रिकथनं सूर्यातप्रतापनं तपायःपिण्डसिकतालीश्वराणां वा निर्बापनं प्रसादनञ्च कर्त्तव्यं नागचम्पकोत्पलपाटलापुष्पप्रभृतिभिश्वाधिवासनमिति ।

Suśruta Samhitā, I. xlvi.

² तत्र सप्तकलुषस्य प्रसाधनानि भवन्ति । तदथा । कतकगोभिदकविषयश्वेवालसूलवस्त्राणि सुक्रामणिश्वेति । पञ्चनित्रेपणानिभवन्ति । तदथा । फलकं व्राष्टकं सुञ्जवलय उदकमच्छिकाशिकञ्चेति । सप्तशैतिकरणानि भवन्ति । प्रवातस्थापनसुदकप्रक्षेपणं यष्टिकाभामणं व्यजनं वस्त्रोद्धरणं वालुका प्रक्षेपणं शिक्कावलम्बनञ्चेति ।

He mentions five kinds of means for preventing contact of the water vessel with the earth¹ :—

1. Phalaka or planks as of Sālmali wood.
2. Tryastaka or octagonal tripod of wood.
3. Muñjvalaya or circular pad of Saccharine Muñja.
4. Udagamañcikā or a raised framework of cane and bamboo.
5. Šikya or a loop suspended by three strings.

He mentions seven ways of cooling water :—

1. Exposure to air.
2. Sprinkling water on the vessel.
3. Stirring the water with a rod.
4. Fanning the water.
5. Filtration through cotton fabrics.
6. Putting the vessel of water on a sand bed.
7. Suspension of the vessel in a loop.

He advises us to use rain water filtered through a broad piece of white and clean cloth². In collecting water from the rivers and ponds, the Hindu females still use a kalasi or earthen vessel, the mouth being closed by a piece of cloth.

¹ In the English translations of the Suśruta Saṁhitā, Bibliotheca Indica, Dr. Cattopādhāya translates the passage incorrectly. He misunderstood the terms phalaka, &c. to be remedial agents, necessary in the purification of water.

² गङ्गा पुनः प्रधानं तदुपाददीताश्वयुजे मासि शुचिशूक्ष्मित तपटैकदेशच्युतमथ वा इर्ष्यातलपरिभृष्टमन्यैवा शुचिभिर्भाजनैर्गृह्णीते ।

Suśruta¹ deprecates impure water as injurious to the human system and advises us not to drink or bathe in such water as there is always the risk of being speedily affected with many diseases.

"It (filter) forms one of the eight sacred utensils necessary for a sramana of the Buddhist order. It is a strainer or water-dipper—an apparatus for filtering the water which he drinks, so that he may not, even unwillingly, take animal life"²

One of the six requisites of a Bhikṣu is Parisrāvana, a water-strainer³.

WATER VESSEL.

To store water, Suśruta mentions vessels of gold, or silver, or earth⁴.

"The clean water is kept separately from water for cleansing purposes (*lit.* 'touched' water), and there are two kinds of jars (*i.e.* kundi and kalasa) for each. Earthenware or porcelain is used for the clean jar, and the jar, for water for cleansing purposes (*lit.* touched water) is made of copper or iron. The clean water is ready for drinking at any time, and the 'touched' water for cleansing purposes after having been to the urinal.

¹ व्यापनं वर्जयेन्ति तोयं यदायनार्त्तवं ।

दीपसङ्गनं द्युतनाददौताहितन्तु तत् ॥

व्यापनं सलिलं यस्तु पिवतीहा प्रसाधितं ।

श्वयथुं पाण्डुरोगच्च लग्दोषमविपाकतां ॥

श्वासकासप्रतिश्शायश्वलगुलोदरानि च ।

अन्यान् वा विषमान् रोगान् प्राप्तुयात् चिप्रमेवत् ॥

Suśruta Saṃhitā, I. xlvi.

² The way of Buddha, p. 53.

³ I'Tsing, ch. x.

⁴ सौवर्णं राजते मृत्यये वा पावे निदध्यात् तत्सार्वकालमुपयुज्जीत तस्यालाभे भीमम् ।

Ibid.

The clean jar must be carried in a clean hand, and be placed in a clean place, while the jar for the ‘touched’ water should be grasped by the ‘touched’ (or ‘unclean’) hand and be put in an unclean (or ‘touched’) place. The water in a pure and fresh jar can be drunk at anytime; the water in any other jar is called ‘special water’ (more *lit.* seasonable water *i.e.* water to be used at certain prescribed times, probably *kâlodaka*).¹

BATHING.

The Hindus in their daily life do not eat without having first washed themselves in a bath. They always use a bathing-sheet and this ancient practice is still followed.

Bhâvamîśra says² : “Bathing stimulates the appetite, virile power and strength, prolongs life, allays thirst and burning sensation, cures eczema, and washes out dirt and perspiration.”

Besides the ordinary bath, there is some evidence of the use of a medical bath to cure diseases. I’Tsing says³ : “The World-honoured One taught how to build a bath room, to construct a brick pond in an open place, and to make a medical bath in order to cure a disease. Sometimes he ordained the

¹ I’Tsing. ch. vi.

² दीपनं हृषमायष्टं स्नान मोजो वलप्रदं ।
करुभुमलश्चमःस्वेदतन्त्रा लङ्घाह पापनुत् ॥
वाहैग्रथ सिके: शीतादौ रुपान्तर्याति पीडितः ।
नरस्य खातसाचस्य दीप्तये तेन पावकः ॥
शीतेन पथसा खातं रक्तपित्तप्रशन्तिकात् ।
तदेवोष्णेन तोयेन वल्य वातकफापहम् ॥
शिरः स्नानमच्छुष्य मत्युष्णेनाम्बुदा सदा ।
वातस्थे अ प्रकोपेतु हितनन्त्रं प्रकोपितम् ॥

Bhâva Prakâśa, I. i.

³ I’Tsing, ch. xx.

whole body to be anointed with oil, sometimes the feet to be rubbed with oil every night, or the head every morning ; for such a practice is very good for maintaining clear eyesight and keeping off the cold." "Bathing should always take place when one is hungry. Two kinds of benefits are derived by having meals after bathing. First, the body is pure and empty, being free from all dirt, second, the food will be well digested, as the bathing makes one free from phlegm or any disease of the internal organs. Bathing after a good meal is forbidden in the 'Science of Medicine' " (Kikitsā-Vidyā).

DRINKING VESSEL.

Scented water is advised to be drunk out of cups made of gold, or silver, or copper, or bell-metal, or lapis lazuli or earth.¹ Bhāvamīśra² also mentions cups of the same materials.

"To drink from a jar holding it upright in front is no fault ; but drinking in the afternoon is not permissible. A jar must be made to fit one's mouth ; the top of the cover should be two fingers high ; in it a hole as small as a copper chopstick is made.

Fresh water for drinking must be kept in such a jar. At the side of the jar there is another round hole as large as a small coin, two fingers higher than the drinking-mouth. This hole is used for pouring in water ; two or three gallons may be put in it. A small jar is never used.

¹ See foot-note 2, P. 65.

² जलपावन्तु तास्वस्य तदभावे स्त्रदोहितम् ।

पवित्रं शौतलं पात्रं गठितं स्फटिकेन यत् ॥

काचेन रचितलङ्घन्तथा वैदूर्यं सम्भवम् ।

If one fear that insects or dust may enter in, both the mouth and the hole may be covered by means of bamboo, wood, linen, or leaves. There are some Indian priests who make jars according to this style. In taking water the inside of the jar must be first washed in order to get off any dirt or dust, and then fresh water must be poured in.

A priest who travels, carries his jars, bowl, necessary clothes, by hanging them from shoulders over his cloak, taking an umbrella in his hand. This is the manner of the Buddhist priests in travelling¹.”

DINNER SERVICE.

Suśruta² advises us to use different kinds of vessels for distributing the various kinds of food :—

Iron vessels for ghee or clarified butter.

Silver vessels for drinks, soups and gruels.

¹ I'Tsing, ch. vi.

² घृतं कार्णग्रायसे देयं पेया देयात् राजते ॥
फलानि सर्वभक्त्यांश्च प्रदद्यादैदलिषु च ।
परिगुष्कप्रदिग्धानि सौवर्णेषु प्रकल्पयेत् ॥
प्रदवाणि रसांश्चैव राजतेषु पहारयेत् ।
कट्टराणि खड्डां श्वेतं सर्वान् शैलिषु दापयेत् ॥
दद्यात्तामनये पात्रे सुशीतं मुश्तं पयः ।
यानीयं पानकं भद्रं सूत्रयेषु प्रदापयेत् ॥
काचस्फटिकपात्रेषु शौतलिषु शुभेषु च ।
दद्यादैदूर्थपात्रेषु रागधाडवसट्कान् ॥
पुरस्ताहिमले पात्रे सुविस्तौर्णि मनोरमे ।
मूदः सुपीदनं दद्यात् प्रदेहांश्च सुसंखृतान् ॥

Plantain leaf vessels for fruits and sweetmeats.

Gold vessels for flesh.

Stone vessels for whey.

Copper vessels for milk.

Earthen vessels for water, sherbets and wines.

Glass, crystal, lapis lazuli vessels for rājsādava and saṭṭaka.

In the Bhāva Prakāśa¹ we have a detailed description on the subject—"A dinner service of gold is the best from a medicinal point of view, and it is supposed to be the best tonic for the eye. Eating out of silver is equally efficacious for promoting hepatic functions. A service of zinc improves the intelligence and appetite: Food served in brass utensils promotes wind and heat, but cures phlegmatic disorders and expells worms. The use of steel or glass vessel cures chlorosis, jaundice and intumescence. A stone or clay service brings on poverty. Wooden plates are good appetisers, but help the secretions of phlegmatic humour. The use of certain leaves as plates acts as an antidote against poisons. When at dinner, a water jug with a cup should be placed on the right hand. A copper vessel is the best for the purpose. The next best is an earthen pot. Vessels made of crystal and lapis lazuli are also pure and cooling".²

¹ आथसे काचपावे च भोजनं सिद्धिकारकम् ।

शोथ पाण्डुहरं वल्यं कामलापहसुचमम् ।

श्लेष्ये सखये पावे भोजनं श्रीनिवारणम् ।

दारुङ्गवे विशेषण रुचिदश्ये अकारितु ।

पावं पत्रमयं रुच्यं दौपनं विषपापनुत् ॥

SPOONS.

I¹Tsiug says¹ : "As to the mode of eating in the West, they use only the right hand, but if one has had an illness or has some other reason, one is permitted to keep a spoon for use."

SPITTOONS.

Spittoons were commonly used by the ancient Hindus, and Caraka² mentions it as one of the things necessary for the sick room. It is also mentioned in the *Mohāvagga*³: "And the sethe's wife spat it out into the spittoon." Fa-Hian⁴ noticed a "stone spitting vessel in this country (Kie-sha) belonging to Buddha."

BEDPANS AND URINALS.

The bedpan and urinal were also used by the patients in ancient times. Caraka metions them to be necessary in a sick room.⁵

PUS BASINS.

Metallic basins marked with different measures were used for holding discharges after operations. In the *Aśvavaidyaka*⁶

¹ I'Tsing. ch. xvi.

² चौपन्यस्त्रभाङ्गार प्रतियहाणि ।

* * * *

प्रतियहांशीपचारयेत् ॥

Caraka Samhitā, I. xv.

³ Sacred Books of the East. VIII. i. ll.

⁴ Beal's Records, vol. I. Introduction, xxviii.

⁵ See Page 36 and foot-note 1, P. 34.

⁶ प्रदेशे लोमशे नित्यं लोमान्युतपाद्य वेधयेत् ।

प्रमाणार्थस्त्र पावेण रक्तं गृज्जाति वृद्धिमान् ॥

Aśvavaidyaka, XV. verse 30.

blood let out in the operation of phlebotomy, is recommended to be collected in a basin, so that the quantity may at once be determined.

PESTLE AND MORTAR.

Pestle and mortar are mentioned in the Rgveda for preparing the Soma juice.¹ And their use in pharmacy was well-known to the ancients.

Besides the pestle and mortar of pharmacy, we find mention of a large wooden pestle used in reducing dislocation by Suśruta.² Caraka says that two pestles and motars should be kept in a lying-in-room, the object being to allow the woman some kind of work ; and then she will not lie down idly on her bed if there be any delay in the delivery of the child³. Suśruta also recommends it⁴. “The mortar (ulukhala) and pestle (muṣala) are to be made of very hard wood, viz., both of Varana wood (Crataiga Roxburghii), or the mortar of Palāśa wood (Butea Frondosa), and the pestle of Khadira wood (Acacia Catechu). The former

¹ उलूखलसुतानामविंद्र जलगुलः ॥

* * * *

यचिद्वित्वं गृहे गृहे उलूखलकं युज्यसि ।

Rgveda, 1 M. 28 S. 1 & 2 R.

² See foot-note 6, P. 172.

³ See P. 39, and foot-note 1, P. 40.

सा चेदावीभिः संक्षिप्तमाना न प्रजायेतायैनां ब्रूयात् उत्तिष्ठमूष्लमन्यतरञ्ज गट्टीव्यानेनेतदु-
दूखलं धान्यपूर्णं महम्भुरधिजहि महम्भुरवजृम्भस्त्र चंक्रमस्त्र चान्तरान्तरा इत्येवमुपदिश्यन्यके ।

Caraka Saṃhitā, IV. viii.

कालातीतस्थायिनि गर्भं विशेषतः सधान्यसुदूखलंभूषणेनाभिहन्त्वादिष्मे वा यानासने
संवेत ।

Suśruta Saṃhitā, III. x.

is to be of the height of the knee and the latter three aratnis (cubits) long¹."

On the inner face of the left pillar in the eastern gate of Sanchi Tope, there is a beautiful representation of a kitchen scene, in which the ancient mortar and pestle are shown. "The mortar and two-handed pestle same as those in use at the present day in India. The mortar (okhli) is exactly the same as the Greek *γύδη*, and the Roman pila; and the pestle (musar) is the same as the Greek *Κόπαρον*, and the Roman pilum"²

The pestle and mortar used in pharmacy was called *asmabhālam*. It is still used to pulverise medicaments, and is made of iron or brass.

In the *Mahāvagga*³ we find a reference to the pestle and mortar. "I allow, O Bhikkhus, the use of a chunam as a medicine by whomsoever has the itch, or boils, or a discharge or scabs, or whose body is ill smelling, and to those in health the use of dry dung, and of clay, and of coloring matter. I allow, the use, O Bhikkhus, of a pestle and mortar" (*udukhalam nusalañ ka*).

SIEVES, STRAINERS AND FILTERS.

There is evidence that cloth sieve was used by the Hindus in ancient days, we find it mentioned in the *Rgveda*⁴. The purpose of straining and filtering solid and liquid medicines respectively is mentioned to have been served by two or

¹ Schol. on Katy. 1.3.3.6. footnote, *Satapatha Brāhmaṇa* (Sacred Books of the East, 1.1.4.8.)

² Cunningham's *Bhilsa Topes*, p. 207.

³ *Mahāvāgga* VI. 9. 2.

⁴ *Rgveda*, 10m. 71s. V 2

three layers of a piece of cloth. And we know that in the prehistoric Soma rites, it "was pressed, passed through a seive, mixed with milk, and offered as the main oblation".

The reference to a cloth sieve, we find in *Mohāvagga*¹: "Now at that time the Bhikkhus who were sick had need of sifted chunam as medicine.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a chunam sieve".

They had need of the chunam very fine.

"I allow, O Bhikkhus, the use of a cloth sieve".

Pavitra was used in the Vedic times². It was a filter. Wilson translates it: "Through the purifying filters".

COLD AND HOT APPLICATIONS.

To relieve colic pains, vessels made of silver, copper or precious stones, containing cold water, are directed to be placed upon the part or better upon the navel³. Besides these, leather vessels containing cold water are also directed to be used for reducing the temperature in dilirium tremens.⁴

¹ *Mohāvagga* VI. 10. 1.

² मध्यः पुनानाः कविभिः पवित्रैर्द्युभिर्हिंचत्यक्षुभिर्धनवैः ॥

Rgveda, 3m. 31 s. 16 Rk.

अंशुं दुहन्ति हस्तिनो भरितैर्मध्यः पुनन्ति धारया पवित्रैः ॥

Ibid, 3m. 36 s. 7 Rk.

³ मणिराजत तामानि भाजनानि च सर्वशः ।

वारिपूर्णानि तान्यस्य ग्लस्योपरि निचिपेत् ॥

Suśruta Saṃhitā, VI. xlvi.

⁴ हिमराजत कांस्यानां पात्राणां शीतवारिभिः ।

पूर्णानां हिमपूर्णानां डतानां पवनाहताः ॥

Caraka Saṃhitā, VI. xii.

Heat is directed to be applied to the patient's body in various ways¹ :—

I. Tāpasveda :—palm of the hand, brass dish, sand, cloth, potsherd &c. are the means mentioned for applying heat to the body.

II. Uṣṇasveda :—potsherds, stone, bricks, or iron balls are to be heated to redness and then water is to be sprinkled upon them. The part to be fomented is covered by a wet piece of thick lint and then the heated materials are to be applied over it. Or heat may be applied by means of a narrow vessel containing hot decoctions. The vessel is to be surrounded by a piece of

¹ चतुर्विधः स्वेदस्तद् यथा । तापस्वेद उष्णस्वेद उपनाहस्तेद्वैद्रव स्वेद इति । अत सर्वस्वेद विकल्पावरोधः ॥

तत्र ताप-स्वेदः । पाणि कांस्यकन्दकपाल वालुकावस्त्रैः प्रथुच्यते शयानस्यचाङ्गतापो वहुशः खादिराङ्गरैरिति । उष्ण-स्वेदस्तु कपाल पाणाणेष्टकालोह-पिण्डानश्चिवर्णानङ्गि रासिञ्चेदम्भं द्रव्यैर्वाते राद्रालक्तक परिवेष्टिमङ्ग-प्रदेशं स्वेदयेत् । मांस रस पयोदधि धान्याम्लवातहर पवभङ्ग काथ पूर्णा' वा कूम्भीमनुततां प्रावल्योधाणं गज्जीयात् । पार्श्व छिद्रेण वा कुम्भेनाधो-मुखेन तत्त्वं सुखमभिसन्धाय तथिन् छिद्रे हस्ति शुण्डाकारां नाडौ प्रणिधाय तम् स्वेदयेत् ।

सुखोपविष्टं स्वभृतं गुरु प्रावरणाहतं ।

हस्तिशुण्डिकया नाडा स्वेदयेत्तात्-रोगिणां ॥

सुखा सर्वाङ्गं गृह्णाता न च क्षिश्राति मानवं ।

व्यामार्द्दमात्रा विर्वक्ता हस्ति हस्ति समाकृतिः ॥

स्वेदनार्थं हिता नाडौ कैलिङ्गी छस्त्रौ शुण्डिका ।

* * * * *

उपनाह स्वेदस्तु वातहरमूलक न्कैरम्भं पिष्ठैर्वणं प्रगाढैः सुखोणैः प्रदित्त्वा स्वेदयेत् । एवं काकोल्यादिभिः सुरसादिभिस्तिलातमी सर्पप कम्कैः क्षशरा पायसोल्कारिका-भिर्वेसवारैः शाल्यैर्बातमुवस्त्रावनडैः स्वेदयेत् ।

द्रव स्वेदस्तु-वातहर द्रव्यकाथ पूर्णे कोणं कटाहि द्रोणां वावगात्त्वा स्वेदयेत् । एवं पयोमांस-रस-घुष-तैल-धान्याम्ल-घृत-वसा मूदेष्ववगाहेत सुखोणैः कषायैः परिषिञ्चेदिति ।

cloth to prevent the skin from being burnt. Or heat may be applied by the following device:—an earthen vessel or kalasi containing hot decoctions is to be closed; and the vessel is then to be inverted. Then a hole should be bored on its side, and a tube shaped like an elephant's proboscis is fitted to it; the vapour issuing from the tube is allowed to play on the part.

To apply vapour bath:—put the hot infusion of medicinal substances into an earthen vessel and close its mouth. Drill a hole into the side of the vessel and adapt a tube to it. The tube may be either metallic or wooden. The tube should be two hands (forearm and hand) long and made of three pieces; the end of the tube which should taper like a cow's tail must be six anguli long. The patient should be seated on a stool and well covered with cloth. The tube is then introduced inside the blanket, and thus the issuing vapours heat the whole body. (Sāringadhara¹).

Suśruta says that the tube should be half byām (*i.e.*, the distance between the two hands when extended) long, bent thrice and shaped like an elephant's proboscis. Sometimes a large stone slab is to be heated with burning wood of Acacia Catechu. Then after removing the ashes, the patient is directed to lie upon it. A tent or cloth-cover having four doors is sometimes required for the patient to sit in, and heat is applied by burning wood outside it.

¹ अथवा वातनिर्णयद्रव्यकाथरसादिभिः ।

उच्चैर्घटं पूर्वयित्वा पात्रे छिद्रं विधाय च ॥

विसुद्धात्मं विश्वरूपात्मं धातुजां काषजां तथा ।

षड्हुलासां गोपुच्चां नाडौ युज्जात् दिव्वस्तिकां ॥

मुखोपविश्च स्वभ्यक्तं गुरुप्रावरणावतम् ॥

इसीशुभिकथा नाद्या स्वेदयेवातरोगिणाम् ॥

Sāringadhara Samgraha, III, ii.

III. Upānahasveda or poultices :—roots of medicinal plants are to be pressed and formed into a paste with mustard, sesame etc. This is to be heated, put on a thin cloth and so applied.

IV. Dravasveda or hot bath :—the patient is to sit in a tub or vessel of hot water. Iron pails or tubs are recommended to be used by patients to take bath in some infusions. Śāringadhara says¹: The tub (droṇī) should be made of gold, or silver, or copper, or iron, or wood. The height and length of the tub should measure thirty-six aṅguli each. When the patient sits inside, the height of water should stand six aṅguli above the navel. A droṇī filled with oil is to be used for placing an unconscious patient in it to overcome the shock caused by fall, blows, fractures and other injuries.

Cakradatta² describes the four methods of applying heat, Bhāvamīśra also describes them similarly³. Hārita, however, mentions seven methods of heat-application⁴.

¹ सौवर्णं राजतं वापि ताम्रमायसच्च दारुजम् ।

कोष्ठकं तच कुञ्जीतोऽक्षये षट्क्रिंशदङ्गुलम् ॥

आथमेन तदेव साच्चतुष्टां मस्तुष्टां तथा ।

नामः षडङ्गुलं यावन्मग्नः काथस्य धारया ॥

Śāringadhara Saṅgraha, III. ii.

² तप्ते: सैकतपाणिकांश्वसनैः स्वेदोऽयवाङ्गारक-

लंपादातहरैः सहान्त्वलवणस्त्वैः सुखोर्णीर्भवेत् ।

एवं तप्तपयोऽन्वूबातश्मनकायादिमिकादिभि-

स्त्रैस्त्रीयनिषिद्धनीङ्गवहङ्गायैः शिलादैः क्रमात् ॥

Cakradatta, Svedādbikāra.

³ स्वेदश्चतुर्विधः प्रोक्तस्तापोऽस्वेदसंज्ञितः ।

उपनाहो द्रवः स्वेदः स्वर्वं वातार्चिह्नारिणः ।

तापस्वेद उपस्वेदश्च ताप्यां संज्ञितः ।

Bhava Prokāśa, I. i.

⁴ स्वेदः सपविधः प्रोक्तो लोषस्वेदो वाष्पस्वेदोऽग्निज्वालास्वेदः ।

षट्स्वेदो जलस्वेदो फलस्वेदो वालुकास्वेदश्च ।

Hārita Saṁhitā, V. iv.

BALANCE OR MĀNADANDA.

For weighing medicinal substances, the scales and balance are often mentioned. They mention a set of weights and measures to be used in weighing substances. Alberuni¹ describes the Hindu balance thus:—"The balance with which the Hindus weigh things, are *χαρίσ τιωνξες* of which the weights are immovable, whilst the scales move on certain marks and lines. Therefore the balance is called *tūla*. The first lines mark the unit of the weight from 1 to 5, and further on to 10; the following lines mean the tenths, 10, 20, 30, &c. In Fergusson's Tree and Serpent Worship we have a diagram of steel-yard, where a man is represented as stepping in the scale, apparently to weigh himself². The ordinary balance is still in common use amongst the kavirājes of the present day.

COLLYRIUM POTS.

The Hindus used to apply collyrium to their eyes, from a very early time. It is said to stimulate the growth of eye-lashes, brighten the lusture of the eye-balls and clean the pupil³.

Bhāvamīśra⁴ recommends us to use collyrium as it improves the visual power and cures many diseases of the eye. It is

¹ Alberuni's India. Trans, by Sachau, vol. I, p. 146.

² The Tree and Serpent Worship, the pl. lxxxiii. fig. I.

³ पञ्चलं विश्वदं कान्तममलोच्चुलं मरुलं ॥

नेवमञ्जनं संयोगाद्वभवेच्चामलं तारकं ।

Suśrūtā Saṁhitā, IV. xxiv.

⁴ सौवीरमञ्जनं नित्यं हितमत्थोस्ततो भजेत् ।

लोचने भवतसेन गनोच्चे सूच्छदर्शने ॥

“सौवीर” श्रेत सुरमा इति लोके प्रसिद्धम् ।

स्त्रोतोऽञ्जनं मतं श्रेष्ठं विशुद्धं सिद्धुसम्बवम् ॥

contra-indicated in patients suffering from fever, emesis, exhaustion, &c.

Suśruta mentions collyrium pots of different metals intended for different kinds of collyrium then in use—

gold	pots	for	sweet	collyrium.
silver	pots	for	acid	collyrium.
horn	pots	for	salt	collyrium.
copper & iron	pots	for	astringent	collyrium.
lapis lazuli	pots	for	sour or acid	collyrium.
bell-metal	pots	for	bitter	collyrium.

He also mentions pots of ivory, or crystal, or coral, or horn, or conch-shell, or stone, or gold, or silver¹.

He also mentions a piece of bamboo for storing collyrium². A bamboo is still used by the poor for keeping oil in India. For a similar purpose the wood of Khadira (*Accacia Catechu*) is also

दृष्टे: कण्ठमलहरं दाहक्षेद् रुजापहम् ।

अच्छोरुपावहच्चैव सहनेमारुतातपौ ॥

नेवरोगा न जायते तस्मादज्ञन माचरेत् ।

“श्रीतोऽज्ञने” क्षणमुरमा इति लोके प्रसिद्धं ॥ “विशुद्ध” शोधनं विनायि ।

“सिंभुसम्भवम्” सिंभुनाम पर्वतस्तत्र सम्भवम् ।

रात्रौ जागरितः शान्तः कृद्वितो भुक्तवांस्तथा ।

ज्वरातुरः शिरस्तातो नात्स्तोरज्ञनमाचरेत् ।

Bhāva Prokāśa, I. i.

¹ See foot-note 3, P. 67.

² कुञ्जकाशोकशालास्पिधङ्ग नलिनोत्पलैः ॥

पुष्पैर्हरेणुक्तथाहापथ्यामलक संयुतैः ।

सर्पिं मधुयुतैश्चूर्णवणुनाड्यामवस्थितैः ॥

recommended¹. For storing oil, Dr Chavala² mentions the use of vessels of stone or the horn of a lamb or iron.

MEDICINE GLASS.

Sukti or shell of mussel was used as medicine glass. The shell of the fresh water mussels unionacea is mentioned to be used for holding a dose of medicine for administering it to a patient³. They generally have equivalve, though not equisided, shells which are covered externally with a smooth brown epidermis and internally by a mother-of-pearl layer. Such a shell “is said to have been formerly much used in England by painters for holding their colour and so the commonest variety is termed unio pictorua. To apply oleaginous errhines, Suśruta⁴ recommends us to use metallic pots or the shell of mussel. It is still used in India for feeding the babies with milk and also for administering medicines to the patient. Heyue⁵ (1814) says that “according to the nature of the disender, the medicines should be taken out of gold, silver or brass vessels. But if these should not be at hand you may use iron or even earthen vessel.”

¹ सैन्धवीपहितं युज्जात्रिहितं वेणुगङ्गरे ।

मदोयकदृष्टतचाजं पिपलः सैन्धवं भध ॥

रसमालकचापि पक्षं सम्बृद्धं निधापयेत् ।

कोशि खदिरनिर्माणे तदत् चादाङ्गनं हितं ॥

Suśruta Saṃhitā, VI. xvii.

² See foot note, 4. P. 67.

³ तत उपसंस्कृतशरीरः प्रातः प्रातरुत्याय पाणिशुद्धिमात्रं चौद्रेण प्रतिसंस्कृयोपयुज्ञीत ।
Suśruta Saṃhitā, IV. x.

⁴ वामहस्तं प्रदेशिन्यं शीद्रामितनालायाय विशुद्धं सोतसि दक्षिणं हस्तेन न्ते हस्तानु तप्तं रजतं सुवर्णं तामस्तन्याव शुक्तिनामन्यतम यं शुक्त्या पितुना वा सुखोणं स्ते हस्तद्रुतभासिच्छेदं व्यवक्षिद्वन्धारं यथानिवेन प्राप्नीति ।

Ibid. IV. xl.

⁵ Dr. Heyne's Indian Tracts,

DROPPER.

The Hindus used a tent of cotton as a drop conductor. Cakradatta¹ advises us to drop medicines into the eyes thus:—the patient should be made to lie down in a place free from draught; the surgeon is to open his eye with the left hand, while with the right, he allows 10 or 12 drops of medicine to fall from a height of two aṅguli on the eye from a tent of cotton, immersed in medicine contained in a clean vessel.

GRIND-STONE.

Grind-stone to pulverise medicaments is mentioned. In the Mahāvagga² we find a reference to it. “I allow, O Bhikkhus, the use of a grind stone, and of another stone to grind upon” (pisana-silā ka pisana poto ka—Buddhaghosha).

STONE AND IRON MULLER.

For similar purpose a stone slab and iron muller are necessary to make pastes and powders of medicines. On the inner face of the left pillar in the eastern gate of Sanchi Topes, the kitchen scene is represented, in which “a fourth woman is seated grinding spices or condiments on the sil, or flat stone, with a bant or round muller³”.

KHAL OR ELLIPTICAL MORTAR OF STONE AND PESTLE.

To prepare medicines to be exhibited to the patients, a small

¹ निवातस्थस्य वासेन पाणिनीमौल्य लोचनम् ।

युक्तौप्रलभ्यथानेन पितृवर्च्या कनीनिके ।

दश द्वादश वा विन्दू द्वाङ्गुलादवसेचयेत् ।

Cakradatta, Āśotaneyāñśana Adhikāra.

² Mahāvagga vi. 3.2.

³ Cunningham Cunningham's Bhilsa Topes, p. 206.

elliptical mortar is generally used when the medicines require to be thoroughly mixed with some excipient.

The following appliances, besides those mentioned before, become necessary in pharmacy :—

1. Iron pails of various sizes.
2. Vessels of iron, copper, silver, brass and earth for storing medicines.
3. Spoons of wood or darvi; large metallic spoon or hata.
4. Iron sandarša or pinchers.
5. Rods of wood or iron.
6. Blacksmith's bellows.
7. Ankuša or hooks like the elephant driver's goad.
8. Iron hammer.
9. Earthen crucibles of different sizes.

CHAPTER IX.

THE CONCLUSION.

In the recent edition of the System of Medicine, Prof. Albatt¹ begins his article on the History of medicine with the following observations : “The medicine of Egypt and the East, extensive and intricate as it was, in so far as it was not Greek did not contain even the rudiments of science. To it Western medicine owes virtually nothing, and in this article at any rate, it may be disregarded”. Prof. Osler² also speaks in the same strain : “Crude and bizzare among the primitive nations, these ideas of disease received among the Greeks and Romans a practical development worthy of these peoples. There have been systemes of so-called divine healing in all the great civilizations, but for beauty of conception and for grandeur of detail in the execution, all are as nothing in comparison with the cult of the son of Appolo, and of Æsculapius, the god of healing.” “Scientific medicine, the product of a union of religion with philosophy, had its origin in a remarkable conjunction of gifts and conditions among the Greeks in the sixth centuries”.

Such opinions remind us of an assertion of Sir William Jones³ “that there is no evidence that in any language of Asia there exists one original treatise on medicine considered as science”. About a century has elapsed since the time of Sir William but we see that the same misconception still prevails in the minds of

¹ Albatt and Rolleston. *System of Medicine*, vol. I, p. 1.

² Osler and Mcrae's *System of Medicine*.

³ Discourse xi. *Sir William Jone's Works*, Vol. I, p. 161.

the scholars. Macdonell¹ gives us a succinct account of the intellectual debt of Europe to the various branches of science and art of the Hindus but regrets that the genetic connection of Indian medicine with that of Greece can not at present be definitely settled. "The question as to whether Indian medical science in its earlier period was affected by that of the Greeks can not be answered with certainty, the two systems not having hitherto been compared with sufficient care." The European mind is quite naturally in the habit of tracing all knowledge to Greece, the fountain of all their knowledge in philosophy and science. But impartial writers are not wanting to vindicate the claims of the Hindus. So Wise remarks as follows² :—"Facts regarding the ancient history of medicine have been sought for only in the classical authors of Greece and Rome and have been arranged to suit a traditional theory which repudiated all systems which did not proceed from a Greecian source. We are familiar from our youth with classical history and love to recall events illustrated by the torch of genius and depicted on our memories; and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found to alter early impressions. Still candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions". Royle maintains³ that "from the mixture, however, of much ignorance and absurdity with what is valuable, many will be apt to despise altogether the medicine of the East. But if it be recollect how long in Europe prevailed the influence of Galen,

¹ History of Sanskrit Literature, ch. xvi.

² Review of the History of Medicine. Introduction.

³ Antiquity of Hindu Medicine, p. 61.

as well as how many absurd formulas still figure in some continental pharmacopeas, as also how comparatively recent is the time since our own was so greatly improved; some feeling of humiliation will control the pride with which we now view the medical sciences". Neuberger says¹; "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them. and owing to its wealth of knowledge, depth of speculation and systematic construction, takes an outstanding position in the history of oriental medicine." It is no doubt unsatisfactory to find that such notions are still allowed to stand in the way of impartial conclusions by eminent men of science especially by those who write history of medicine. But it is not the fault of the historians alone, the fault lies with us for not having supplied them with adequate materials. Something has been done in this field of research by men like Wilson, Heyne, Ainsle, Royle, Dutt, Thacore Shaheb, Jolley, Hoernle and others, but it is nothing when compared to what is required to be done. To supply this want partially, we have endeavoured in this monograph to describe the surgical instruments of the Hindus, with a comparative study of the instruments of the Greek, Roman and Arab surgeons, and of the surgeons in modern times. By a careful study of this subject, we can not avoid the conclusion that the medicine of India though it was not Greek, contained the requirements of science and has a fair claim to be considered in the history of medicine. To it western medicine really owes something and so the subject has been studied and investigated thoroughly.

¹ Neuberger. History of Medicine. Trans. by Playfair. Vol. I. p. 487.

Apart from the usefulness of the study for collecting materials for the history of medicine, there are good reasons for a critical examination of the subject. The knowledge of the Hindus in medical science was by no means rudimentary. There is evidence to show that they were inferior to none in the quality or quantity of the knowledge of the science at that early age. Hoernle says:¹ “Its extent and accuracy are surprising when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.” They practised dissection of human bodies and their anatomical studies have the mark of high order. “We have seen that they used various forms of surgical instruments. The Hindus cut for stone couched for the cataract and extracted the foetus from the womb”. They performed abdominal section, practised cranial surgery successfully and no region of the body was thought sacred to the knife. They repaired nose and ears by plastic operations, treated fractures and reduced dislocations, and were experts in performing amputations. They reduced hernia, cured piles and fistula-in-ano by surgical technique, and inoculated and vaccinated for small-pox. Field surgery was thoroughly understood and arrows were extracted with skill. They were acquainted with the circulation of the blood,²

¹ Hoernle's Osteology, Preface. P. iii.

² याभिरिदं शरीरमाराम इव जलहारिष्येभिः कैदार इव च कूच्याभिरुपस्तिष्ठते-इग्रहितेचाकुञ्चन प्रसारणादिभिर्विशेषैः। द्रुमपवसेवनीनामिव च तासां प्रतानासासां नाभिमूलं ततश्च प्रसरन्यूङ्गभस्तिर्थक् च।

Suśruta Samhitā, III. vii.

देहस्थोत्पत्तिरस्तजो देहस्थेनैव धार्थते ।
रक्तं जीवस्य चाधारस्तमाद्रचेदसग्रुधः ॥

the distinction between the artery and vein,¹ the use of anaesthetics, the means of arresting haemorrhage and the proper treatment of surgical wounds. They enumerated 107 vital parts of the body to be avoided, if possible, by the surgeon in practising his handicraft.²

In medicine they first propounded the humoral pathology. Though it seems fanciful in the light of modern culture, it must be admitted that no other theory has been attempted to explain the causation of disease in recent times. "They were the first nation who employed minerals internally and to them we owe the therapeutic use of mercury and arsenic in intermittents". They introduced massage, postural treatment and magnet in therapeutics. They excelled in chemistry and contrived many instruments for the preparation of chemical compounds. Atomic theory was discovered by Kanāda; and "they knew how to prepare sulphuric acid, nitric acid and muriatic acid, the oxide of copper, iron, lead (of which they had both the red oxide and litharge),"

विश्वता द्रवता रागश्वलनं विलयस्थापा ।
भूम्यादिपञ्चभूतानामेते रक्ते गुणाः स्फूर्ताः ॥
रक्ते दुष्टे भवेच्छोथी रक्तमण्डलमेव च ।
व्यथादाहश्च पाकश्च कर्णश्च पीड़कोद्घासः ।
बृह्मे रक्ताङ्गं निचत्वं शिराणां पूर्णता तथा ।
गावाणां गौरवं निद्रा मेहो दाहश्च जायते ॥

Sāringadharā Saṅgraha, III. xii.

Bhāva Prakāśa, I. ii.

¹ इन्द्रगोपप्रभं श्वेयं प्रह्लितिस्थसमंहतम् ।

Sāringadharā Saṅgraha, III. xii.

गृढाः समस्थिताः स्विग्धा रोहिन्यः शुद्धशेषितम् ।

Aṣṭāṅga Hṛdaya Saṁhitā, II. iii.

² सप्तोत्तरं मर्येश्वते ।

Suśruta Saṁhitā, III, vi.

tin, and zinc ; the sulphuret of iron, copper, mercury, antimony and arsenic ; the sulphate of copper, zinc and iron ; and carbonates of lead and iron¹. The processes of solution, calcination and distillation were discovered by them.

They understood the action of drugs and no less than 500 classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases, and their remedial agents have been collected from the vegetable, animal and mineral kingdoms. There are 41 different forms in which the medicaments may be exhibited to the patient. We have the earliest notice respecting zoology and botanical geography in their works. They had a complete nomenclature of diseases which are described minutely as regards their ætiology, symptomatology, diagnosis, pathology, prognosis and treatment.

Veterinary science was well known to them, and treatises on horses and elephants—Aśvavaidyaka and Pālakāpya² are still extant, and will repay perusal. Even there is a treatise on the treatment of plants and trees³. Thus we see that the Hindu medical science must not be condemned offhand and requires a careful and sympathetic research by scholars, before it can be excluded from the history of the science.

But I must be careful not to allow my enthusiast admiration carry me too far. It is quite true that the Ayurvedic system has its faults. It has been remarked that “it consisted of erroneous

¹ Elphinstone's History of India, 8th ed. p. 160.

² Another book on the medicine of elephants is quoted by Alberuni. See Sachan's Preface to Indica, p. xl.

³ For the bibliography of the Ayurvedic books, see my work “Materials, Biographical and Bibliographical, for the History of Hindu Medicine”. (In the press).

doctrines founded upon a most fanciful anatomy, physiology and pathology. Much indeed could hardly be expected of a science based upon an anatomy which taught that the navel "constituted a centre from which a vascular system, including 40 principal vessels originated¹; upon a physiology which declared that these vessels were destined to convey blood, air, bile and phlegm to all parts of the body, and upon a pathology which maintained that disease depended either upon derangements of one or more of these humours or "upon the influence of good or evil spirits".² It must however be remembered that this criticism refers to a theory elaborated some 3000 years before. The idea that the navel formed the centre of the vascular system apparently had its origin in the foetal circulation³. The position of the heart was well-known and its function as a profeelling organ is

¹ यावत्यस्तु सिराः काये सम्बवन्ति शरीरिणां ।
नाथां सर्वा निवद्वास्ताः प्रतन्वन्ति समन्वयः ॥
नाभिस्थाः प्राणिनां प्राणाः प्राणान्नाभिर्वृपाश्रिता ।
सिराभिराहता नाभिष्क्रन्नाभिरिवारकैः ॥

तासां मूलसिराश्वलारिंशत्तासां वातवाहिन्यो दश पिचबाहिन्यो दश कफवाहिन्यो दश दश
रक्तवाहिन्यः ।

Suśruta Saṃhitā, III. viii.

तस्यान्तरेण नाभिस्तु ज्योतिःस्थानं ध्रुवं स्मृतं ।
तदा धर्मति वातस्तु देहसेनास वईते ॥

Ibid. III. iv.

² A course of lectures on the Principles and Practice of Medicine delivered at Calcutta Medical College. By Francis. 1868.

³ मातुस्तु खलु रसवहायां नाथां गर्भनाभिनाड़ी प्रतिवद्वा सास्य मातुराहाररस-
बौथंभिवड्हति । तेनोपदेहेनास्याभिड्हिर्भवति ।

Suśruta Saṃhitā, III. iii.

described in the ancient books¹. In the later Tantras the origin of the nerves from the spinal cord and the brain is distinctly stated². The ancient Hindus, like the Babylonians, thought the heart to be the seat of the understanding, and the liver as the central organ of the blood. The Greeks were the most cultured nation at that age, and the knowledge of the two nations can be compared to our advantage. The Hindus did not share with the Greeks the belief that the uterus is “an animal within an animal” and that it can be attracted by pleasant smells and repelled by pungent substances”³. The humoural pathology was also the keystone of the Greecian system. The belief in the good and evil spirit was the only alternative to the pathologists when the microscope and the germ theory of diseases were unknown. It is highly creditable to the classical Greek physicians for banishing superstition from the practice of the art; but we know that the later Greek writers Aetius, Alexander and Paulus, and the Latin medical literature, were not free from its baneful influence. The belief in charms and miracles in the cure of diseases seems to be universal and is

¹ स रसः इत्युच्यते । तस्य च हृदयं स्थानं स हृदयाच्चतुर्बिंशतीः धमनौरनुप्रविश्योऽगा दश दश चाषोगमिन्यच्चतस्तस्तिर्थगाः ॥ ज्ञातस्मै शरीरमहरहस्तपूर्यति वईययि धारयति यापयति जीवयति चादृष्टहेतुकेन कर्मणा ।

Sūsruta Samhitā, I. xiv.

* द्वे हैं तिर्थक् गते नाथौ चतुर्बिंशति संख्यया ।

मेरुदण्डेस्थिताः सर्वे सूते मणिगणाडव ॥

* * * *

जल्यमूलमधःशाखं हृच्चाकारं कलेवरं ।

यथाश्रव्यदले तदृश् शरीरे नाड्यस्थिताः ॥

Tantra.

² Paulus Aegineta, Adam's Commentary, Vol. I. P. 636.

working even at the present time. Adams says¹ that "considering the faith which many educated persons now repose in the virtues of galvanic rings and garters, the present generation has little ground for laughing at the credulity of our forefathers, with respect to amulets and other phylacteries".

In later times, attempts have been made to substitute other theories in the place of the humoral, and we know with what results. "Paracelsus substituted an equally baseless hypothesis, that the fundamental element of the human body were three principles : sal, the solid element; quicksilver, the liquid; and sulphur, the aerial. This formula was the badge of the Paracelsist school up to the end of the 17th century." Sylvius and Willi (17th century) of the Iatro-chemical school "referred most diseases to morbid matters or "aerimonies" produced by perverted secretions, and these being sometimes too alkaline, sometimes too acid, the antithesis of acid and alkali became the badge or catch word" of their system. Friedrich Hoffman (1660-1742) constructed another system which "supposed life to be a universally diffused ether, which entering the animal body, became transformed in the brain into Pneuma or nervous fluid. "George Ernest Stahl (1660-1734) believed in the hypothesis of Animism, and "the symptoms of disease were regarded as the conscious efforts of the soul to overcome the morbid influences". William Cullen (1712-90) "propounded a new system of medicine, intended to reconcile the opposing views of his predecessors. Its main feature was the importance attached to the nervous system in the causation of disease." Lastly the "Brunonian" system of John Brown, based on

¹ Adam's Commentary on Paul.

the doctrine of stimulus, and Hahneman's theory of homœopathy need be mentioned here to complete the list.¹ Thus we see that even some of the eminent men of science indulged in fanciful theories in quite modern times.

The study of ancient Hindu medicine has an antiquarian value. It is perhaps the oldest system of medical science still extant. Fragments of Egyptian and Assyrian medicine have no doubt been unearthed. But these cannot be compared with the complete system of the medical science as preserved in the early Sanskrit works on the subject. The Hindus believe their science of medicine to be of divine origin and this belief is founded upon the fact that the existence of the medical profession can be traced back to prehistoric times. The humoural theory is mentioned in the R̄gveda² which according to the consensus of opinions amongst the European savants can not be later than 2000 B.C., and possibly earlier. The Buddhists relate a story, how, in one of his former births, Buddha was born as a medicine-man. "In the Mahosadha birth the archangel Sakka came to him as he was being born, and placing some fine sandal-wood in his hand, went away. He came out from the womb holding this in his fist. His mother asked him "What is it you hold, dear, as you come?" He answered "Medicine, mother!" So because he came holding medicine, they gave him the name of medicine-child (osadhadhāraka). Taking the medicine they kept it in a chatty (an earthenware water-pot) and it became

¹ Medicine in modern Europe. Payne in Albutt's System of Medicine, vol. I, p. 26, 29, 34.

² ओमानं श्योर्मकाय सनवे विधातु शर्म वहतं शुभस्ती ॥

R̄gveda, i. 34, 6.

a drug by which all the sickness of the blind and deaf and others as many as came, was healed—so the saying sprang up, “This is a powerful drug”; and hence he was called Mahosadha (The great medicine-man).¹ This early date of the science amongst the Hindus is not exceptional. It is now well-known that so severe an operation as trephining the skull was often performed in the early stone age. “Trephined skulls from neolithic period have been found in most European countries, in Algiers, the Canaries, North America, Mexico, Peru and the Argentine”². In the Code of Hammurabi, king of Babylon (2285-2242 B. C.), there are thirteen articles regulating medical practice. One deals with the responsibilities of a surgeon performing operations on the eye. The laws Hammurabi lay down that:—

“If a Physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver.

“If it be a freedman, he shall have five shekels.

“If it be any one’s slave, his owner shall give the physician two shekels of silver.

“If the physician make a severe wound with a bronze operating knife and the patient die, or if he open a growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off.

“If a physician make a severe wound on the person of

¹ Rhys David’s Buddhist Birth Stories, vol. I, p. 67-68.

² Neubergor’s History of Medicine, P. 3.

a slave belonging to a freed man with the bronze operating knife and kill him, he shall replace the slave by another slave.

"If a physieian heal a broken bone or cure diseased bowels, the patient shall pay the physian five shekels of silver."¹

Homer pays tribute to Egypt for her

"Patron-god imparts

To all the Pharian race his healing arts."

Herodotus says that the Egyptian physicians were specialists of particular diseases, and Clement of Alexandria mentions forty-two Hermetic books on medicine by the god Thot.

"According to Manetho, he (Teta) constructed the Royal castle of Memphis and wrote a work on anatomy² being particularly occupied with medicine. The latter supposition is rendered more complete to a certain extent by the account, due to Ebers Papyrus³, that the method of making the hair grow, described accurately therein, was supposed to have been discovered by our king's mother, Shesh."⁴ Teta was the second king of the first dynasty of the old Memphis kingdom and flourished in 4366 B. C. King Senta of the second dynasty owned a medical work which belonged to Semti or Hesepeti (4266 B. C.), the 5th king of the first dynasty.⁵ "Tosorthros of the third dynasty, was said to have composed a treatise on medicine,⁶ a fact which

¹ Neuberger. History of Medicine, P. 18.

² Manetho, in Müller-Didot, Fragmenta Historicum Græc, vol. II, pp. 539, 540.

³ Ebers Papyrus, Pl. lxvi, 1, 5.

⁴ Historian's History of the World, vol. I, Egypt and Mesopotamia. p. 91.

⁵ Ibid, p. 68.

⁶ Manetho, etc., vol. II, p. 544.

caused him to be identified with the healing god Imhotpû."¹ These facts suggest a great age for Egyptian medicine. Medicine flourished among the Assyrians: "Fragments of an old work on medicine have been found, which show that all known diseases have been classified and their symptoms described; and the medical mixtures considered appropriate to each being compounded and prescribed quite in modern fashion."²

The oldest medical treatise extant amongst the Chinese is the Neiching, the authorship being attributed to Hwang-ti; it dates back to B. C. 2597. Mr. Gatzlaff,³ missionary in China, has given us a short view of a celebrated work, in 40 volumes, on Chinese medicines, which is called Ching che chun ching *i. e.*, "Approved marking line of medical practice"⁴ So the Hippocratic treatises (460 B. C.) are rather modern compilations compared to these ancient books; and as told by Plato, the priest of Sais was fully justified when he addressed to Solon: "You Greeks, you are but children."⁵

It will be seen again that a comparative study of the science discloses remarkable affinity to the systems of the other contemporary nations. The fabulous origin of medicine in India and Greece can not fail to attract the notice of even a casual observer. The resemblance of Dakṣa, the preceptor of the two Aśvins, the offspring of Sun, who after learning the

¹ Ibid, p. 544 and 545.

Quoted in Maspero's "The Dawn of Civilization." Edited by Prof. Sayce, 5th ed. p. 238.

² Assyria; its Princes, Priests and Peoples, Sayce, p. 119.

³ Proceedings of the Asiatic Society, Part VII, p. 154.

⁴ Royle. Antiquity of Hindu Medicine, p. 67.

⁵ Timæus, p. 22.

Āyurveda from their father became the medical attendants of the gods, to Aesculapius—the reputed son of Apollo, and his two sons Machaon and Podalarius, celebrated in the Homeric poems, is indeed remarkable. More remarkable is the belief in humoural pathology shared by the two nations, separated from each other by continents and seas, and alienated from each other by the differences in customs, manners and religion. The theory of independent origin and developement falls to the ground, especially when we consider the strange coincidence in the surgical instruments used by the two nations in performing surgical operations. Some of the instruments used by the Hindus were not only identical in structure and shape to the instruments of the Greeks, but they had even the same name. Thus for instance, the alābu yantra of the Hindus corresponds to the description of the cucurbitula of the Greeks, and both the terms mean a gourd. A śringa is the horn; aṅguli yantra or mudrikā is the finger or ring-knife; yoni-vraṇekṣaṇa is the diopter or vaginal speculum; aṅkuśa is the hook; &c. Some instruments though they have different names are identical in structure and uses. Thus, the Scammum Hippocraticum or the Plinthium Nelei is the Greek counterpart of the Hindu kapātaśayana; the lithotomy binding of the yantraśatakam; the clyster of the vastiyantra; the saw of the karapatra; the needle of the sūcī; &c. Again many surgical operations are similarly described in both the systems, as for examples, the operations for stone and cataract may be cited. In the description of diseases, passages occur in books which seem to be a literal translation of one from the other. Thus in describing the symptoms of hydrophobia, Paulus quotes Rufus who pronounces it to be a . . .

species of melancholy and then observes "Which reason accords also with those who say that they think they saw the image of the dog that bit them in water". The word "those" in the above sentence becomes clear to us when we read a similar passage in the kalpasthāna of the Suśruta Saṁhitā, and it may be thus translated:¹ "If the patient sees the image of the animal that bit him in the water or mirror, he is sure to die." Other passages might be multiplied but our limited space forbids any further quotations. All these coincidences can scarcely be accidental; and though we may not be able to trace the actual progress of medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt.

Thus the question of the relation of the medical science of the Hindus to that of the Greeks naturally suggests itself for solution. The possibility of a dependence of the either on the other can not be dismissed offhand for we have historical evidence of communication between the two nations at a very early age. We need not dwell at length upon those shoals and quagmires of historical controversies, the alleged conquest of India by Egyptian Seostris as recorded by Diodorus Seculus² in prehistoric times; the connection of the Phœnician traders as proved by the articles of merchandise,—cinnamon, aloes, onyx, agate, ebony, tin and ivory³ diamond, gold and

¹ अप्सुवा यदिवादर्शं रिष्टं तस्य विनिर्दिशेत् ॥
वस्त्रत्वकम्भाद् योऽभीज्ञः श्रलाघटापि वा जलं ।
जलवासन्तुविद्यात् रिष्टं तमापिकौर्चिंतं ॥

Suśrutiā Saṁhitā, V. vi.

² I. ib. I. ch. 43. Nolan.

³ Strabo. xv 37. [Quotes Megasthenes; Theophrastus quoted by MacCrindle in Ancient India as described by classical authors, p. 46; Virgil. Georg. 11. 116-17 ("India alone produces black ebony"), Georg. 1. 57. ("India sends Ivory"), Lonsdale and Lee's trans.; Horace, odes 1. 31.]

embroidered work¹ the commercial enterprises of the ships of Solomon (992 B.C.) from Ezion-Gaber² under the guidance of the mariners of Hiram (B.C. 980-917) which brought back the gold of "ophir," its almug trees and ivory, apes and peacocks; the possibility of an Indo-Hellenic intercourse to explain the remarkable coincidences between the systems of philosophy current amongst the two nations, and which culminated in the bold theory of Pococke³ that Pythagoras, who is generally considered to be the founder of the healing art amongst the Greeks⁴ was an adaptation of the Buddhugurus, and the assertion that Greece must have been an Indian colony before. Let us rather tread on firmer grounds and we know that two Greek physicians, Ktesias (about 400 B.C.) and Megasthenes (300 B.C.) visited Northern India. Ktesias in his Indica mentions the cochineal plant, its worm and dyes, monkeys, elephant and parrot. He says that the Indians were free from headache, toothache or ophthalmia and from mouth sores or ulcers. Alexander the Great (B.C. 327), so says Nearchus, employed some Hindu vaids in his camp in India to consult them in cases of snake-bites and other dangerous ailments. Megasthenes mentions ebony as growing in Bengal, and tiger, monkey and elephants are also alluded to. Strabbo mentions that Daimacus was sent to the court of Candragupta's son, but unfortunately the book he wrote about India is lost to us. Mention also should be made of the intercourse of Egypt with India under the Ptolemies and we know, that Ptolemy

¹ Birdwood's Industrial Arts of India, pp. 263-4.

² I. King. ix. 27; xii, p. 22.

³ India in Greece.

⁴ See the Origin and Growth of the Healing Art—Beddoe. 162.

Philadelphous sent an embassy headed by one Dionysos to the court of Pātaliputra. Another source of dessemination of Hindu learning over the Western world is the emigration of the Buddhist missionaries to the kingdoms of Ptolemies and Greek kings as proved by the edicts of Aśoka. "And the Greek Simnoi (venerable) were no other than the Buddhist sramanas (these simnoi whom Clement of Alexandria has narrated to have rendered worship to a pyramid originally dedicated to the relics of a god, were the Buddhist Arhats (venerable) sramanas).¹ The intercourse of the East and West after the Christian era is well known and will not supply us with any proof as to the indebtedness of the Greeks and Hindus to each other; though "Dietz proves that the late Greek physicians were acquainted with the medical works of the Hindus, and availed themselves of their medicaments"; but he more particularly shows that the Arabians were familiar with them, and extolled the healing art as practised by the Indians, quite as much as that in use among the Greeks.²

But what is more important to us as a proof of the influence of the Indian medical science upon the Greecian system is the identification of drugs of Indian origin in the *materia medica* of the Greeks. For instance the Sacred Bean of Pythagoras has been identified with Utpalam or Indian Nelumbium.³ Hippocrates the Great, who was contemporary and kinsman of Ktesias⁴ the court physician to the king of Persia, mentions:—Sesamum Indicum (Tila); Nardostachys Jatamansi

¹ Lalitvistaram. Mitter's ed. ch. 1.

² Journal of Education, Vol. viii, p. 176.

³ Pratt's Flowering Plants, Vol. 1, p. 67.

⁴ Galen ; Comment, in libr. de artic. iii.

(*Jatāmānsī*); Beswillia Thurifera (*Kunduru*) ; Zinziber Officinale (*Śringavera*) ; and Piper Nigrum (*Marici*). Dioscorides (1st century A.D.) in his *Materia Medica* describes :—Agallochum, Bdellium, Ebony (*Diosphynos Ebenaster*), Ammomum zinziberis (Ginger), Calamus aromatious (sweet cane of Scripture), Eletteria Cardamomum (*Elaci*), Lyceum Indicum or Russot, the product of Berbera lycium, Atramentum (Indigo), Onyx or the operculum of an Indian shell-fish, etc. In later times, we find Aetius, an Alexandrian writer of the 5th century describing Indian nuts, sandal wood, cocoanuts, etc. Symon Set mentions camphor ; and Paulus Aegineta (7th century A.D.), a writer well known for his judicious condensation of the Greek medical literature, mentions Aloes, Cantharides (*Mylabris Cichory*), Cloves (*Caryophyllum Aromaticus*), Millet (*Panicum Halicum*), Costos (root of *Aucklandia Costos*), Cassia (*Cinnamomum Cassia*), Indian stones as amulets, Malabathri or *tejpāt* (*Laurus Cassia*), Ambar, etc.

Now let us reproduce some of the conclusions arrived at by Western scholars as the result of the controversy. As regards philosophy, Colebrooke¹ asserts that “the Hindus were teachers and not learners”. Cunningham² says: “ Indians have the advantage in point of time; and I feel satisfied that the Greeks borrowed much of their philosophy from the East” Weber³ remarks that “there is no ground whatever to suppose that Suśruta borrowed his system of medicine from the Greeks, on the contrary there is much to tell against such an idea”.

¹ Transactions of the Royal Asiatic Society, vol. I.

² Bhilsa Topes, pp. 32-33.

³ History of Indian Literature,

Prof. Diaz of the Konnigsberg University, detects the principles of Indian medicine in the medical literature of the Greeks". "It is to the Hindus" says Wise, "we owe the first system of medicine." Royle has proved beyond doubt the indebtedness of the Greeks and Arabs to the Hindus. Haas's theory that Suśruta is the Indian adaptation of the Arabic name of Suqrat or Buqrat, the Arabic corruption of the Greek Hippocrates, and that Kāsi is an adaptation of the Island of Cos has been deservedly condemned as "an elaborate joke". Neuherger says:¹— "The similarity between Indian and Greek medicine of the period is in its outline and in certain details so striking that it is hardly surprising that the originality of the former has frequently been questioned or even denied. The more so is this true since the dates of the more important Indian works are fixed with the greatest difficulty, and before the discovery of the most recent manuscripts they were quite indefinite.

In consideration of the outstanding independent achievements of the Indians in most branches of science and art, and of their aversion from foreign influences, the trend of opinion to-day, informed by recent discoveries is in favour of the originality of Indian medicine in its most salient features."

Another fact must here be pointed out that the Hindus always acknowledged any help they might have received from other nations for the development of their science. The striking proof of this is found with reference to the science of astronomy—the only branch of learning which seems to have been influenced by the Greeks. Varāhamihira compiled his famous Pañcasidhāntica or the collection of the five old treatises on astronomy,

¹ Neuherger. History of medicine, Vol. I, p. 45.

viz., Paulisa, Romaka, Vaśiṣṭha, Saura, and Paitamoha. Both Weber and Kern have no doubt that Paulisa was a Greek and the name Romaka speaks for itself. But in the Hindu medical literature there is no mention of any foreign help, and the Indian medical treatises do not contain a single technical term which points to a foreign origin. It is interesting to quote the well known passage of Garga : "The Yavanas (Greeks) are Mlechhas, but amongst them the science (astrology) is well established. Therefore they are honoured as R̄sis—how much more than an astrologer who is a Brāhmaṇ". It is a standing monument of the catholic spirit of the Hindus, and they know no better way to show their respect for the learned men of the world. To this may well be contrasted the behaviour of the Greeks towards the other nations. The doctrines of Pythagoras are pre-eminently Indian¹, but that philosopher has not a word to speak of the Hindus. In astronomy the Greeks are indebted to Babylon : Ptolemy mentions that Hipparchus worked out and improved upon the astronomical computations of the Babylonians with reference to the moon ; but recent discoveries from the clay tablets have shown that the figures ascribed to Hipparchus are merely copied from the numerical values worked out in Babylon. "The discovery of the precession of the equinoxes is generally ascribed to Hipparchus. It was he indeed, who brought this fact to the Greeks, and he estimated its yearly amount as from 36 to 39 seconds, but it is certain that he learned about it in Chaldea, and that he obtained the elements of his calculations from the astronomical observations made on the lower Euphrates".² Paulus Aegineta

¹ See Enfield's History of Philosophy.

² Historian's History of the World. Vol. I, p. 596.

gives us a complete system of operative surgery of the ancients. Celsus, in the last two books of his work, has treated of the surgical operations with considerable accuracy; and though the former availed himself of the labours of the latter, Celsus is never mentioned as one of the sources of informations used by Paulus who appears to have been wholly unacquainted with his works; and Adams remarks "but when did a Greek writer ever acknowledge himself under obligation to a Roman"?

But are we to suppose that the Greeks wilfully concealed the names of the Indian physicians in their books? Surely not. The Greeks might not have known the real source of the informations which they probably received second-hand. There is historical evidence of an intercommunication between Greece and Persia from the time of Ktesias or the 4th century B. C. to the 6th century A. D. We also know of a tradition that the services of the Great Hippocrates—a kinsman of Ktesias, were required in the Persian court, but he declined the invitation. Again we know that books on ancient sciences of India were possibly made use of by the Persians in early times, and to this intercommunication may be due "the coincidences which have been observed between the science of the Greeks and that of the Hindus" (Royle).

As regards the indebtedness of the Persians to Sanskrit literature, "we have positive testimony on the subject, as the Baron de Sacy, in his account of the well-known Sanskrit origin of the Fables of Pilpay, states that these were first translated in Pehlevi during the reign of the Persian king Nooshirwan, who ascended the throne in 531, and died in 579 and who is reported by historians to have encouraged learning, and to have induced Greecian philosophy at his court. The translations

were made by the physician Barzouyeh who had brought the original from India with other books, and who by more than one previous journey to that country, had acquired a knowledge of Sanskrit. He is stated particularly, to have made two journeys, one for the purpose of procuring medicaments and herbs, and the other for obtaining specimens of literature of the Hindus”¹. “Previous even to this (A. D. 330), we hear of the Persian king Bahram visiting, in disguise, the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus.”²

But whatever differences of opinion there may be as regards the relation of the Greeks to the Hindoos, there is no doubt that the medical science of the Arabs was materially influenced by Hindu medicine. For we know that the medical treatises of Caraka, Suśruta and Mādhava were translated into Arabic in the beginning of the 8th century A. D., and the names of Scarac, Seirac or Xarac and Sarad occur in the Latin translations of Avicenna, Rhases, and Serapion.³ Rāy dwells at length on the similarity of description of leeches as written by Suśruta and Rhazes. The modern medical science of the West is principally based on the Greecian system as preserved in the books of the Arabian authors and so indirectly depends for some particulars at least upon the Indian system.

Sachau in his preface to Alberuni’s India⁴ remarks as

¹ Antiquity of Hindu Medicine, p. 168-69.

² Ibid, p. 73.

³ Rhazes: ‘De Emblico,’ (Scarac Indianus), ‘De Zinzibere, (Sarac) Serapion: ‘De Myrobalanis’ (Xarch Indus), ‘De Emblicis et bellericis (Xarcha Indus); Avicenna: ‘Sub Emblico’ (Seirac Indum).

⁴ Alberuni’s India, Preface, p. xxx-xxxii.

follows :—“ What India has contributed reached Bagdad by two different roads. Part has come directly in translations from the Sanskrit, part has travelled through Iran, having originally been translated from Sanskrit (Pali ? Prakrit ?) into Persian, and further from Persian into Arabic. In this way, *e.g.* the fables of Kalila and Dimna have been communicated to the Arabs, and a book on medicine probably the famous Caraka. *cf.* Fihrist p. 303 ”. The Arabs also translated “ Indian works on snakes (sarvavidyā), on poison (visavidyā).....on the veterinary art¹.....But not only were the medical books translated into Arabic we have evidence that Indian doctors practised in foreign courts. Sachau continues :² “ Another influx of Hindu learning took place under Harun (A. D. 786-808). The ministereal family Barmak, then at the zenith of their power, had come with the ruling dynasty from Balkh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar, *i. e.*, nava vihāra—the new temple (or monastery). The name Barmak is said to be of Indian descent, meaning paramaka, *i. e.*, the superior (abbot of the vihāra ?) *cf.* Kern, Geschichte des Buddhismus in Indien, ii. 445, 543. Of course, the Barmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions, they sent scholars to India, there to study medicine and pharmacology. Besides, they engaged Hindu scholars to come to Bagdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit

¹ Alberuni's India, Preface, p. xxxiv.

² Ibid p. xxxii.

into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries, muslim scholars travelled for the same purpose as the emissaries of the Barmak, *e. g.*, Almuwaffak, not long before Alberuni's time (*Codex Vindobonensis, sive medici Abu Mansur liber, fundamentorum pharmaeologiæ*, Ed. Selignann, Vienna, 1859, pp. 6, 10, and 15, 9)."

"Harun-al-Rashid (786-809) had two Indians Manka and Saleh, as physicians at his court"¹ Manka translated the classical work on medicine, *Suśruta* (*cf.* Steinschneider, *Wissenschaftliche Blätter*, Vol. I, p. 79) and a treatise on poison, ascribed to Kānakya, from Sanskrit into Persian (see Prof. Flügel, in *Zietschrift der D. M. G.* xi. 148 and s. 325). A Hebrew treatise on poison, ascribed to the Indian Zanik (Kanakya) is mentioned by Steinschneider *Wissenschaftliche Blätter*, Vol. I, p. 65). Alberuni mentions an Indian Kankab as astrologer of Harun-al-Rashid (Reinaud, *mémoire sur l' Inde*, p. 315). He is likewise mentioned as a physician. Another Indian physician of Harun-al-Rashid is called Mankba (Reinaud). In the year 1381, a work on veterinary medicine ascribed to Salotar was translated from Sanskrit by the order of Firroz Shaha after the capture of Nagorecote. A copy of it was preserved in the Royal Library of Lucknow². Among the Hindu physicians of the time one ابن دھنی is mentioned *i.e.*, the son of DHN, director of the hospital of the Barmaks in Bagdad. This may be Dhanya, or Dhanian chosen probably on account of its etymological relationship with the name *Dhanvantari* the name

¹ Prof. Dietz, quoted by Royle, p. 64.

² Maxmüller's *Science of Language*, Vol. I, p. 166.

of the mythical physician of the gods in Manu's law book and the epics (*cf.* A. Weber, *Indische Litteraturgeschichte*, pp. 284, 287). A similar relation seems to exist between the names *Kanka*, that of a physician of the same period, and *Kankayana*, an authority on Indian medicine (Weber *l. c.*, pp. 287, note, and 284 note, 302). The name *جبل*, that of an author of a book on drinkables, may be identified with *Atri*, mentioned as a medical author by Weber, *l. c.* p. 288.”¹

For informations on the Arabic translations of Sanskrit works, see *Analecta Medica* by Dietz; Wustendeld's *Geschichte der Arab Aerzte*; Cureton, “A collection of such passages relative to India as may occur in Arabic writers”; Wilson's note to the above in *J. R. A. S.* old series, vi, pp. 105-115. Puschmann, p. 162; and Bedrœ, book iv. ch. 11. pp 286-299.

The Arabians added many durgs to the meteria medica of the Greeks and amongst them we find the following Indian drugs described :—

Diudar or Pinus Deodara.....	Devadāru ²
Artemesia Indica.....	Nāgdamani.
Piper cubeba.....	Sugandha marica.
Cassia fistula.....	Suvarnakha.
Senna or Cassia obvata.....	Sonāmukhī.
Galangal or Alpina galangal, Roxb.....	Kulin-jana.
Ammomum grana paradisi.	
Macis.....	Mace.
Nux moschata.....	Nutmeg.

¹ Sachau. *Ibid* p. xxxii.

² It is described by Avicenna under its Sanskrit name, where he says that deindar, “est ex genera abhel juniperus, que dicitur pinus Inda; et syr diudar est ejus lac” (Quoted by Royle).

Bdellium.....	Guggula.
Tamarindus Indica.....	Tintidī.
Trifolia.....	Triphala. ¹
Myrobalani.....	Haritaki.
Turpeth or Convolvulus Turpethum.....	Trivit.
Sel or Aegle marmelos.....	Vilva.
Santalum rubrum.....	Candana.
Melia azadirachta.....	Nimba.
Tembul (Piper betel).....	Tāmbūl.
Faufil (Arecha catechu).....	Khadira.
Nux vomica.....	Viṣamuṣṭi.
Musa paradisiaca or plantain.....	Kadalī.
Moschos moschifera (from Thibet & India)	Mṛganābhi.
Dolichos lebleb.	
Orange or Citrus aurantium.....	Nāgarāṅga.
Limon or citrus medica.....	Mātuluṅga.
Pearls and other precious stones such as lapiz lazuli. Borax, &c.	
Rhabarburnum or Indian Rhubarb, etc.	

We can trace the Arabic and Greek names of some of the medicaments to a Sanskrit source. Royle has discussed them at length, so we need give here only a synopsis of it:—

Triphalā (S)—Tryphalla (A)—Tryphalla (G)—Tryphala parva (modern).

Devadāru (S)—Deiudar(Avicenna)—Deedara (G)—Pinus deodaru.

Tvaka-kshira (S)—Tabosheer (A).

Tamālpatra (S)—Malatroon or Malabathrum (G).

Tejapatra(s), or tuj—Sadej (A).

¹ Actuarins copies from Serapion and Mesue, the use of this medicine. The very name is Sanskrit, meaning the 3 myrobalans. Serapion refers to Xarch indus or Charak, in his De Myrobalani (Royle, P. 37).

Tāmbula (S)—Tumbol (P)—Tunbol (A).

Pippalī (S)—Pippul (H)—pilpil (P)—filfil (A)—(G)—piper (E).

Sṛṅgavera (S)—Shimgveez (P)—Zinzabil (A)—Zingiber (E).
Aguru (S)—aggur (H)—Agila (M)—Pao-d'aglia (aquilia)
(po)—Aod Hindee Agallochum (G).

Candana (S)—chundan (H)—Shandana (T)—Sundul (P)—
Santal (E).

Kolinjana (S)—Galanga (G).

Vaca (S)—Wuz (A).

Dāvrusita (S)—Darcheeni (H)—Darsheeni (A).

Cacyn-nama (C)—Akimona (P)—Kaimanis (M)—Cinnamon.

Kuṣṭha (S)—Kooth (H)—Kust (A)—Koosrus (G)—
Koshta (Sy).

Abnus—Ebony (E).

Kubara (S)—pupal (P)—fufal (A).

Sajikā (S)—Sajiiamattee, sajiloon, sajii (H)—Sajimen vitri
(Geber)—Soza or soda (E).

Khar, khari (S)—Kali. (A).

Kussas, missy (India)—misy (A)—misy (G).

Tincana (borax)—Tinkar (P)—tincal (E).

Ambara (S)—Kharoba (A)—Amber, Ambegrise (E).

Kassis (tin)—Kassiteros (G).

Tuttha (S)—tootum or tutia (H)—tutia (P)—tatanagum
(T)—tutenagun and tutty.

Manaśilā (S)—Mansil (G).

Haritāl (S)—hartal.

Sarkarā (S)—sakkara (T)—sukkur (A)—Sugar (E).

Sandaracha (S) or sulphuret of arsenic—Zarnach (P & G).

Sphotaka (S)—phoska (B)—pocca (A. S.)—pocke (Ger).

Tintidi (S)—Tamar Hind (A)—Tamuarin (Fr)—Tamarinds (Italy & Sp.)—Tamarind (B)—Tamarindus India (L).

Masurikā (S)—Masern (Ger)—Measles (E).

Vrana (S)—verole (Fr)—variola (L).

Danga (Hindus)—Dandy—Dengue (Sp).

S—Sanskrit. A—Arabic. G—Greek. T—Tamil. P—Persian. M—Malayan. Po—Portuguese. Sy—Syriac. Ger—German. A. S.—Anglo-Saxon. H—Hindi. E—English. B—Bengali. Fr—French. L—Tatin. It—Italy. Sp—Spanish.

Not only is the influence of the Sanskrit medical works detected in the Persian, Hebrew, Arabic, Greek and Roman works on medicine, there is evidence that the Hindu system of medicine was also adopted by the Tibetans and the Chinese. In the January No. 37 of the J.A.S.B. 1835 Vol. IV, an analysis of a Thibetan work is given by Alexander Csoma de Koros. It is called “rgyud bzhi” (the tract in 4 parts). It is attributed to Sakhya. “In the time of Khrisrong Dehutsan (*i.e.* 8th or 9th century of the Christian era) a Tibetan interpreter Bairotsana (or Vairochana) having translated in Cashmere, with the assistance of physician-pandit (Davam Non-gah) presented it to the above mentioned Thibetan king.” In a Note on Thibetan surgical instruments, Walsh says:¹ “The present practice of surgery in Tibet is very simple, and, as already noted, consists chiefly of cupping, cauterizing, and bleeding. The Am-chhi informed me that the only instruments used are the cupping-bow (असुन् me-puṇ, or असुम् me-bum, both meaning ‘fire vessel’), in which

¹ The Thibetan Anatomical System by E. H. C. Walsh in J. R. A. S. 1910, pp. 1244-45.

paper is lit and the bowl is placed while hot over the part to be blistered; the sucking-horn (ରୈମାର୍ ହିଜିବୁ), by which cupping by vacuum is done; the cautery (ଶ୍ଵାସକ୍ଷେତ୍ର ଲ୍ଚାଗ୍ସମେ), the lancet (ଟ୍ରେଟ୍ ର୍ତ୍ସା-ୱ), for bleeding, and a golden lancet (ଶ୍ଵରଶ୍ଵର୍ତ୍ତ୍ତ୍ଵ ଗ୍ସେର କ୍ୟି ର୍ତ୍ସା-ୱ) for operating on the eye.

In the journal of the Buddhist Text Society of Calcutta for 1894 three Tibetan block prints are illustrated, which contain representations of a large number of surgical instruments, some of them of an elaborate nature, including specula, saws, catheters, exploring needles, instruments for tapping hydrocele, and midwifery and other forceps. The block-prints were brought by Rai Saratchandra Das, Bahadur, from Lhasa,¹ and a description of the figures was given by the late Lama Šes-rab MGya Mtsho, the Abbot of Ghoom Monastery, near Darjeeling, who was formerly physician to the late Tashi Lama, which were explained in a paper read by Dr. Saradaprasad Banerjee.²

If the elaborate and various instruments shown in the block-print were ever in general use they appear to have now ceased to be used."

In the J.R.A.S. April 1907, is mentioned "a Chinese text corresponding to a part of the Bower manuscript" by Watanbe. The identified portion of the MSS. consists of the six leaves which appear in plates XLIX-LIV (Hoernle's ed). The corresponding Chinese text is contained in six translations of which the following three, correspond completely to the MSS.

¹ Journal of the Buddhist Text Society, Vol. II, Pt. III, Calcutta 1894. P. III.

² Ibid, pp. IX. X.

1.	Mohamayuri vidya-rajui	—translated by I'tsing	705 A.D.
2.	„	„	Amoghavajra 746 to 771 A.D.
3.	„	„	Sanghapala 516 A.D.

Again many articles are common to the Hindus and Chinese *materia medica*; as many aromatics (nutmeg, cloves, cinnamon and pepper), musk, rhubarb etc. And this is not at all surprising for we have evidence “that there was constant intercourse¹ between these countries even before the Christian era, by means of travellers and ambassadors; and that Buddhist priests in visiting China, took with them as presents classical Indian books. It is also worthy of note, in connexion with the chapter on this subject in *Suśruta*, that in A.D. 648, the Emperor of China having sent an ambassador to India, this officer met with a doctor, who told him that he was 200 years old, and that he possessed the recipe of immortality, upon hearing which, a second embassy was despatched in search of the philosophical stone” (Royle).

Even the modern medical science of Europe has been directly influenced by the Hindu system of medicine. In the *materia medica* used by the doctors in Europe now, we find the following curative agents—the produce of India. I quote here the list as prepared by Thakore Shaheb² :—

“Aconitum heterophyllum	...	Ativisha.
Allium cepa	...	Polandu.
Acacia catechu	...	Khadira.

¹ See *Asiatic Journal*, July 1836.

² *History of Aryan Medical Science*, P. 128.

<i>Alhagi maurorum</i>	...	Yavasa.
<i>Alstonia scholaris</i>	Saptaparna.
<i>Ammomum elettarum</i>	...	Ela.
<i>Andropogon nardus</i>	...	Ushira.
<i>Andropogon schænanthus</i>	...	Katurina.
<i>Artemisia sternutatoria</i>	...	Agnidamani.
<i>Berberis lycium</i>	Daruharidra.
<i>Butea frondosa</i>	Palasha.
<i>Cassia lanceolata</i>	Sonamukhi.
<i>Cucumis colocynthis</i>	...	Indravaruni.
<i>Datura alba, niger &c.</i>	...	Dhattura.
<i>Justicia adhatoda</i>	Atarusha.
<i>Luffa amara</i>	Katukoshtaki.
<i>Linum usitatissimum</i>	...	Atasi.
<i>Mallotus Philippiensis</i>	...	Kapillaka.
<i>Myrica sapida</i>	Katfala.
<i>Ophelia chiretta</i> and <i>Ophelia</i> <i>augustifolia</i>	Kirata.
<i>Pimpinella Anisum</i>	...	Shatapushpa.
<i>Pongamia glabra</i>	Karanja.
<i>Ptychotis ajowan</i>	Ajamoda.
<i>Ricinus communis</i>	...	Eranda.
<i>Salvinia cucullata</i>	...	Undurkarnika.
<i>Santalum album</i> & <i>Santalum</i> <i>flavum</i>	Chandana.
<i>Shorea Robusta</i>	Ajakarna.
<i>Strychnos potatorum</i> , <i>Strychnos</i> <i>nux vomica</i>	Katakafala.
<i>Tinospora Cordifolia</i>	...	Guḍuci.

· Valeriana Hardwicki	...	Tagara.
Wrightia Antidysenterica	...	Indrayava."

To this list may be added the following] drugs from the Indian and Colonial Addendum to the British Pharmacopœa, 1898 :—

Acacia Arabica	...	Vāvvula.
Acalypha Indica	...	Muktabarsi.
Andrographis Paniculata	...	Kirāta.
Aristolochia Indica	...	Arkamula.
Arachia Hypogaea	...	Bucanaka.
Citrus Aurantium	...	Nāgaraṅga.
Azadirachta Indica	...	Nimba.
Aegle Marmelos	...	Vilva.
Piperbetel	...	Tāmbula.
Butæa Gummi.		
Cæsalpina Sappan	...	Patanga or Bakam.
Calotropis Procera and		
C. Gigantiæ	...	Arka. .
Gossypium Herbaceum	...	Kārpāsa.
Cambogia Indica.		
Cissampelos Pariera	...	Ambashthai.
Cosecinum Fenestratum	...	Dāru-haridrā or darvi.
Gynocardia Odorata	...	Chālmugra.
Hygrophila Spinosa	...	Kokilākṣa.
Anogeissus Latifolia		
Embelia Ribes and E. Robusta	...	Vidaṅga.
Plantago Ovata	...	Ispaghula.
Ipomæa Hederacea	...	Kälādāna.
Ipomæa Turpethum	...	Trivit,

Mylabris Phalerta.

Terminalia Chebula	... Haritaki.
Sesamum Indicum	... Tila.
Picrorhiza Kurroa Katuka.
Urginea Indica Vanapalāndu.

As regards the medicines used by the Hindus, Neuberger says¹ :

“The Pharmacopæia, corresponding with the fruitful nature of the land was a rich one and stamps Indian medicine with a character entirely its own, whilst nothing speaks more eloquently for its originality than the fact that of all the many medicinal plants no single one was European.”

Elphinstone wonders at the knowledge of simples in which the Hindus early gave lessons to Europe and “more recently taught us the benefit of smoking Datura in asthma and the use of cowitch against worms,” and “the prescribing of Nux Vomica in paralysis and dyspepsia, and the revival of the use of Croton Tiglinum” (Royle). In surgery, too, the modern surgeons of Europe have borrowed the Indian method of Rhinoplastic operation first made known to European surgeons by a letter which was printed in the Gentleman’s Magazine for October 1794, p. 891. In fact Dr. Hirschberg of Berlin says that “the whole plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us. The transplanting of sensible skin flaps is also an entirely Indian method.” The modern method of making pockets for the

¹ Neuberger, History of Medicine, vol. I. P. 54.

testicles under the Colles' fascia after the operation for scrotal tumour (elephantiasis) can be traced back to the age of Suśrata¹.

Thus we see that it can safely be affirmed that the medical science of Europe has been, both directly and indirectly, influenced by the Hindu System of Medicine.

¹ पादौ निरस्तमुच्चास जर्वेन प्रोत्य चाक्षिणौ ।

प्रवेश्य तु यसीवन्या मुक्तौ सौव्येच्छतः परं ॥

Suśruta Saṁhitā, IV. ii.

THE END.

APPENDIX.

I'Tsing¹ says :—

“The following are the eight sections of medical science. The first treats of all kinds of sores ; the second, of acupuncture for any disease above the neck ; the third, of the diseases of the body ; the fourth, of demoniac disease ; the fifth, of the Agada medicine (i.e. antidote) ; the sixth, of the diseases of children ; the seventh, of the means of lengthening one’s life ; the eighth, of the methods of invigorating the legs and body. ‘Sores’ (1) are of two kinds, inward and outward. The disease above the neck (2) is all that is on the head *and face* ; any disease lower down from the throat is called a ‘bodily’ disease (3). The ‘Demoniac’ (4) is the attack of evil spirits, and the ‘Agada’ (5, but 6 of Âyur-veda) is the medicine for counteracting poisons. By ‘Children’ (6, but 5 of Âyur-veda) is meant from the embryo stage until after a boy’s sixteenth year ; ‘lengthening life’ (7) is to maintain the body so as to live long, while ‘invigorating the legs *and body*’ (8) means to keep the body and limbs strong and healthy. These eight arts formerly existed in eight books, but lately a man epitomized them and made them into one bundle. All physicians in the five parts of India practise according to *this book*, and any physician who is well versed in it never fails to live by the official pay. Therefore Indians greatly honour physicians and much esteem merchants, orf they do not injure life, and they give relief to others as well as benefit themselves. I made a successful study in medical

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 127-8.

science, but as it is not my proper vocation I have finally given it up."

Dr. Takakusu¹ comments on the passage as follows :—

"The eight sections of Medicine which I-tsing describes are no doubt the eight divisions of the Âyur-veda. He mentions an epitomiser of these divisions, who seems to have been a famous physician and contemporary of I-tsing (or just before I-tsing). This epitomiser may be Susruta, who calls himself a disciple of Dhanvantari, one of the Nine Gems in the Court of Vikramâditya.

Prof. Wilson says in his Works, vol. iii, p. 274 :—

'The Âyur-veda, which originally consisted of one hundred sections, of a thousand stanzas each, was adapted to the limited faculties and life of man, by its distribution into eight subdivisions, the enumeration of which conveys to us an accurate idea of the subject of the Ars Medendi amongst the Hindus.'

The eight divisions are as follows :—

I. Sâlya (I-tsing's (1) cure of sores).

The art of extracting extraneous substances, grass, earth, bone, &c., accidentally introduced into the human body, and by analogy, the cure of all phlegmonoid tumours and abscesses. *Salya* means a dart or arrow.

II. Sâlâkya (I-tsing's (2) art of acupuncture).

The treatment of external organic affections or diseases of the eyes, ears, nose, &c. It is derived from *Salâkâ*, "a thin and sharp instrument," and is borrowed from the generic name of the slender probes and needles used in operation on the parts affected.

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 222-3.

The above two divisions constitute the surgery of modern schools.

III. Kâya-kikitsâ (I-tsing's (3) treatment of the diseases of the body).

The application of the Ars Medendi (*Kikitsâ*) to the body in General (*Kâya*). It forms what we mean by the science of medicine.

IV. Bhûta-vidyâ (I-tsing's (4) treatment of demoniac disease).

The restoration of the faculties from a disorganised state induced by demoniacal possession. The art vanished before the diffusion of knowledge, but it formed a very important branch of medical practice through all the schools, Greek, Arabic, or European.

V. Kaumâra-bhritya (I-tsing's (6) treatment of the diseases of children).

The care of infancy, comprehending not only the management of children from their birth, but the treatment of irregular lactic secretion, and puerperal disorders in mothers and nurses.

VI. Agada (I-tsing's (5) Agada medicine).

The administration of antidotes—a subject which, as far as it rests upon scientific principles, is blended with our medicine and surgery.

VII. Râsâyana (I-tsing's (7) application of the means of lengthening one's life).

Chemistry, or more correctly alchemy as the chief end of the chemical combinations it describes, and which are mostly

metallurgic, is the discovery of the universal medicine—the elixir that was to render health permanent, and life perpetual.

VIII. *Vāgikarana* (I-tsing's (8) methods of invigorating the legs and body).

Promotion of the increase of the human race—an illusory research, which, as well as the preceding, is not without its parallel in ancient and modern times.'

Prof. Wilson further remarks :—'We have, therefore, included in these branches all the real and fanciful pursuits of physicians of every time and place. Susruta, however, confines his own work to the classes *Sālya* and *Sālākya* or surgery; although, by an arrangement not uncommon with our own writers, he introduces occasionally the treatment of general diseases and the management of women and children when discussing those topics to which they bear relation.' (See Wilson's Works, vol. iii, p. 276.)"

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