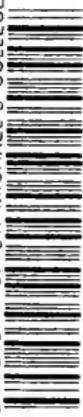


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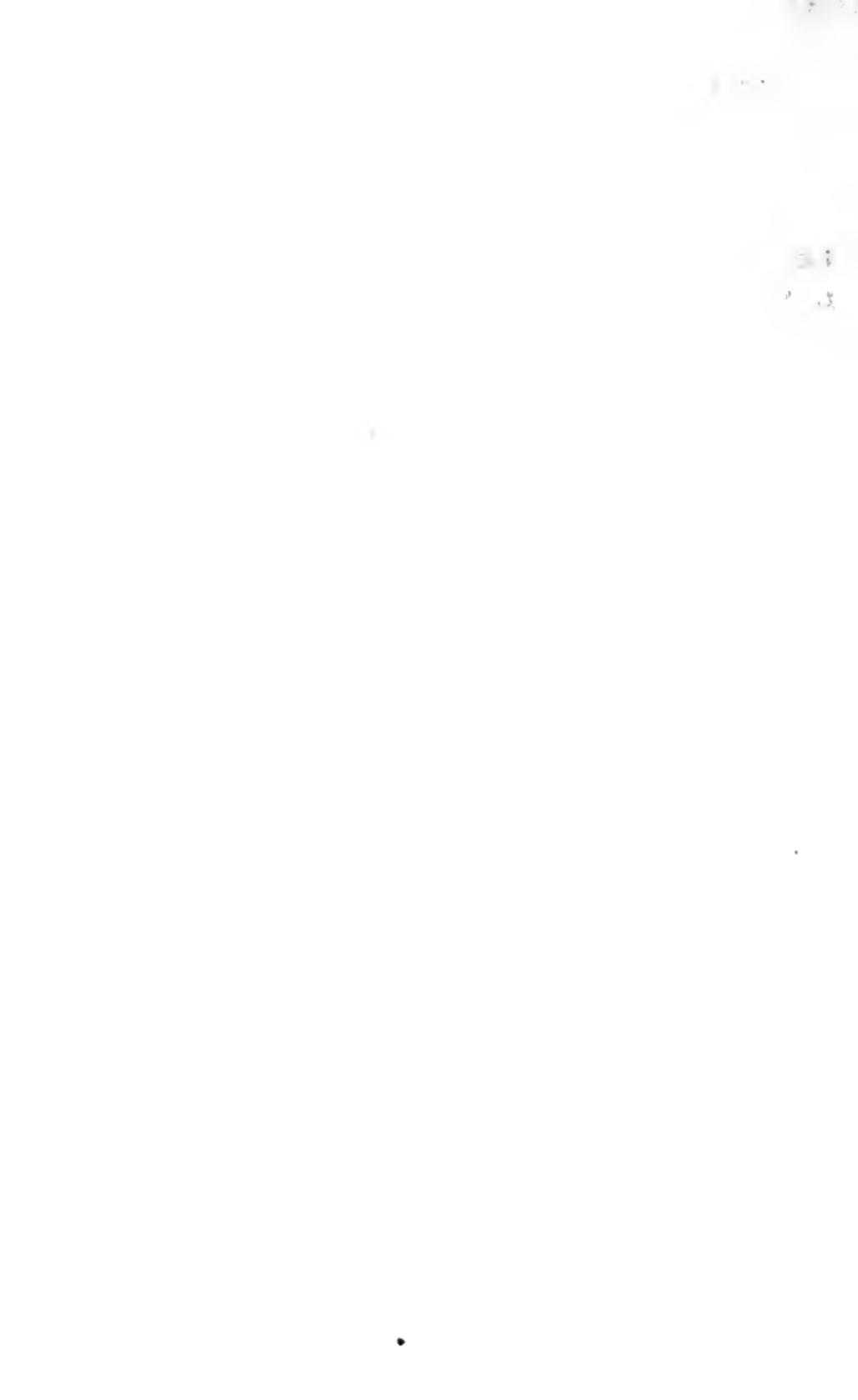
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## CELSUS

III





# CELSUS

## DE MEDICINA

WITH AN ENGLISH TRANSLATION BY  
W. G. SPENCER

MS. LOND., F.R.C.S. ENG.

IN THREE VOLUMES

III



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# CONTENTS

	PAGE
BOOK VII . . . . .	293
BOOK VIII . . . . .	473
APPENDICES . . . . .	589
LIST OF CHAPTER HEADINGS . . . . .	603
PARALLEL PASSAGES IN HIPPOCRATES AND CELSUS . . . . .	624
INDEX OF PROPER NAMES . . . . .	628
GENERAL INDEX . . . . .	633
DIAGRAMS . . . . .	<i>To face pp. 344, 350, 362</i>



CELSUS  
DE MEDICINA

A. CORNELII CELSI  
DE MEDICINA

LIBER VII  
PROOEMIUM

TERTIAM esse medicinae partem, quae manu curet, et vulgo notum et a me (*prooem.* 9) propositum est. Ea non quidem medicamenta atque victus rationem omittit, sed manu tamen plurimum praestat, estque eius effectus inter omnes medicinae partes evidentissimus. Siquidem in morbis, cum multum fortuna conferat, eademque saepe salutaria, saepe vana sint, potest dubitari, secunda valetudo medicinae an  
2 corporis an . . .<sup>1</sup> beneficio contigerit. In iis quoque, in quibus medicamentis maxime nitimur, quamvis profectus evidentior est, tamen sanitatem et per haec frustra quaeri et sine his reddi saepe manifestum est: sicut in oculis quoque deprehendi potest, qui a medicis diu vexati sine his interdum sanescunt. At in ea parte, quae manu curat, evidens omnem profectum, ut aliquid ab aliis adiuvetur, hinc tamen plurimum trahere. Haec autem pars cum sit vetustissima, magis tamen ab illo parente omnis medicinae  
3 Hippocrate quam a prioribus exulta est. Deinde posteaquam diducta ab aliis habere professores suos coepit, in Aegypto quoque Philoxeno maxime increvit auctore, qui pluribus voluminibus hanc

<sup>1</sup> *Marx adds* fortunae before beneficio.

<sup>a</sup> χειρουργία or surgery (*Prooemium* 9).

<sup>b</sup> *Prooemium* 9.

CELSUS  
ON MEDICINE  
BOOK VII  
PROOEMIUM

THE third part of the Art of Medicine is that which cures by the hand,<sup>a</sup> as I have already said,<sup>b</sup> and indeed it is common knowledge. It does not omit medicaments and regulated diets, but does most by hand. The effects of this treatment are more obvious than any other kind; inasmuch as in diseases since luck helps much, and the same things are often salutary, often of no use at all, it may be doubted whether recovery has been due to medicine or a sound body or good luck. Besides, in cases where we depend chiefly upon medicaments, although an improvement is clear enough, yet it is often clear that recovery is sought in vain with them and gained without them: this can be seen for instance in treating the eyes, which after being worried by doctors for a long time sometimes get well without them. But in that part of medicine which cures by hand, it is obvious that all improvement comes chiefly from this, even if it be assisted somewhat in other ways. This branch, although very ancient, was more practised by Hippocrates, the father of all medical art, than by his forerunners. Later it was separated from the rest of medicine, and began to have its own professors; in Egypt it grew especially by the influence of Philoxenus, who wrote a careful and comprehensive work on it in

## CELSUS

partem diligentissime comprehendit. Gorgias quoque et Sostratus et Heron et Apollonii duo et Hammonius Alexandrini multique alii celebres viri singuli quaedam reperierunt. Ac Romae quoque non mediocres professores, maximeque nuper Tryphon pater et Euelpistus et, ut scriptis eius intellegi potest, horum eruditissimus Meges quibusdam in melius mutatis aliquantum ei disciplinae adiecerunt.

- 4 Esse autem chirurgus debet adulescens aut certe adulescentiae propior; manu strenua, stabili, nec umquam intremescente, eaque non minus sinistra quam dextra promptus; acie oculorum acri claraque; animo intrepidus; misericors sic, ut sanari velit eum, quem accepit, non ut clamore eius motus vel magis quam res desiderat properet, vel minus quam necesse est secet; sed perinde faciat omnia, ac si nullus ex vagitibus alterius adfectus oriatur.
- 5 Potest autem requiri, quid huic parti proprie vindicandum sit, quia vulnerum quoque ulcerumque multorum curationes, quas alibi (V. 26 *seqq.*) executus sum, chirurgi sibi vindicant. Ego eundem quidem hominem posse omnia ista praestare concipio; atque ubi se diviserunt, eum laudo qui quam plurimum percepit. Ipse autem huic parti ea reliqui, in quibus vulnus facit medicus, non accipit, et in quibus vulneribus ulceribusque plus profici manu quam medicamento credo; tum quicquid ad ossa pertinet. Quae deinceps exequi adgrediar, dilatisque in aliud volumen (VIII) ossibus, in hoc cetera explicabo;

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<sup>a</sup> See index. The Alexandrian school of medicine flourished from the third century B.C.

<sup>b</sup> V. 26-28.

several volumes. Gorgias also and Sostratus and Heron and the two Apollonii and Ammonius, the Alexandrians,<sup>a</sup> and many other celebrated men, each found out something. In Rome also there have been professors of no mean standing, especially the late Tryphon the father and Euelpistus, and Meges, the most learned of them all, as can be understood from his writings; these have made certain changes for the better, and added considerably to this branch of learning.

Now a surgeon should be youthful or at any rate nearer youth than age; with a strong and steady hand which never trembles, and ready to use the left hand as well as the right; with vision sharp and clear, and spirit undaunted; filled with pity, so that he wishes to cure his patient, yet is not moved by his cries, to go too fast, or cut less than is necessary; but he does everything just as if the cries of pain cause him no emotion.

But it can be asked what is the proper province of this part of my work because surgeons claim for themselves the treatment of wounds as well, and of many of the ulcerations which I have described elsewhere.<sup>b</sup> I for my part deem one and the same man able to undertake all of these; and when divisions are made, I praise him who has undertaken the most. I have myself kept for this part cases in which the practitioner does not find wounds but makes them, and in which I believe wounds and ulcerations to be benefited more by surgery than by medicine; as well as all that which concerns the bones. These cases I shall proceed to discuss in turn, and leaving to another volume the subject of bones I shall deal with the rest in this one; beginning

## CELSUS

praepositisque is, quae in qualibet corporis parte fiunt (*capp.* 1-v), ad ea, quae proprias sedes habent. transibo.

1. Luxata igitur, in quacumque parte corporis sunt, quam primum sic curari debent, ut, qua dolor est, ea scalpello cutis crebro incidatur, detergeaturque eodem averso profluens sanguis. Quod si paulo tardius subvenitur iamque etiam rubor est, qua rubet corpus si tumor quoque accessit, quacumque is 2 est, id optimum auxilium est. Tum superdanda reprimentia sunt, maximeque lana sucida ex aceto et oleo. Quod si levior is casus est, possunt etiam sine scalpello inposita eadem mederi; et si nihil aliud est, cinis quoque maxime ex sarmentis (si is non est, quilibet alius) ex aceto vel etiam ex aqua coactus.

2. Verum hoc quidem promptum est: in iis autem negotium maius est, quae per se vitio intus orto intumescunt et ad suppurationem spectant. Ea omnia genera abscessum esse alias (V. 28. 11) proposui, medicamentaque his idonea executus sum: nunc superest, ut dicam in iisdem quae manu fieri debeant. Ergo priusquam indurescant, cutem incidere et cucurbitulam adcommodare oportet, quae quicquid illuc malae corruptaeque materiae coit, extrahat; idque iterum tertio die recte fit, donec

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<sup>a</sup> VII. 1-5.

<sup>b</sup> VII. 6-33.

<sup>c</sup> *Luxata*. This word is regularly used in Latin writers to mean displacements or dislocations (Cato, *R.R.* 157; Seneca, *Ep.* 104. 18; Pliny, *N.H.*, 31. 6. 37, etc.); but Celsus, who only uses the word here, never applies it to dislocations when describing these lesions in Book VIII. 11, and the description given here suggests that he has in view rather injuries from blows as in boxing, where the use of the caestus caused abrasions of the skin as well as subcutaneous haemorrhage

with cases which occur anywhere in the body<sup>a</sup> I shall pass on to those which occur in special situations.<sup>b</sup>

1. First then displacements,<sup>c</sup> in whatever part of the body they are, ought to be immediately treated, so that the skin is several times incised with a sharp scalpel where the pain is, and the blood as it issues wiped off with the back of the knife. But if relief is rather slow in coming and there is now redness as well, and if, where the redness is, there is swelling in addition, wherever there is swelling this treatment is best. Repressants are then to be applied, in particular unscoured wool soaked in vinegar and oil. In a slighter case the same applications may afford relief even without the scalpel; and if there is nothing else at hand, wood-ash, preferably of vine twigs, or failing that any other kind, stirred to a paste in vinegar, or even in water.

2. There is prompt relief in such cases; but there is more trouble where a lesion has arisen internally of itself which causes swellings and tends to suppuration. I have described elsewhere<sup>d</sup> the various classes of abscessions, and I have pointed out the suitable medicaments; it now remains to speak of those which should be treated by surgery. Before the abscession becomes hardened, the overlying skin should be scarified and a cup put on, in order to draw outwards whatever bad and corrupted matter has collected; and it is right to repeat this every

(ecchymosis), and where immediate incision prevented widespread suppuration. See Hippocrates III. 30 (*Head Wounds*, XIII. 21). V. d. Linden emended to *vexata* which would have the more general meaning of parts injured.

<sup>a</sup> III. 27. 4—V. 28. 1 D.

## CELSUS

2 omne indicium inflammationis excedat. Neque tamen fas non est nihil cucurbitulam agere: interdum enim fit, sed raro, ut, quicquid abscedit, velamento suo includatur: id antiqui tunicam nominabant. Meges, quia tunica omnis nervosa est, dixit non nasci sub eo vitio nervum, quo caro consumeretur; sed subiecto iam vetustiore pure callum circumdari. Quod ad curationis rationem nullo loco pertinet, quia quicquid, si tunica est, idem, si callus est, fieri debet. Neque ulla res prohibet, etiamsi callus est,  
3 tamen quia cingit, tunicam nominari. Tum pure quoque maturiore haec interdum esse consuevit; ideoque quod sub ea est, extrahi per cucurbitulam non potest. Sed facile id intellegitur, ubi nihil admota illa mutavit. Ergo sive id incidit sive iam durities est, in hac auxilii nihil est, sed, ut alias (V. 28. 11 B, C) scripsi, vel avertenda concurrens eo materia vel digerenda vel ad maturitatem perducenda est. Si priora contigerunt, nihil praeterea necessarium est. Si pus maturuit, in alis quidem et inguinibus raro secundum est, item ubicumque mediocris abscessus est, item quotiens in summa cute vel etiam carne vitium est, nisi festinare cubantis inbecillitas cogit; satisque est cataplasmatibus efficere,  
4 ut per se pus aperiat. Nam fere sine cicatrice potest esse is locus, qui expertus ferrum non est. Si autem altius malum est, considerari debet nervosusne is locus sit an non sit. Nam si sine nervis est, candenti ferramento aperiri debet; cuius haec

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<sup>a</sup> II. 8. 10, 28.

<sup>b</sup> V. 28. 11 B, C.

third day until every indication of inflammation has gone. It may be, however, that the cupping has no effect; for at times, although seldom, it happens that the abscess is enclosed in a covering of its own, which the ancients named a coat. Meges, because every such coat is sinew-like, said that no sinew could be produced under a lesion by which flesh is eaten away; but that when pus has been there for a long time, a callus forms round it. This has no bearing upon the mode of treatment, for the same thing ought to be done, whether it be a coat, or a callus. There is nothing to prevent a callus <sup>a</sup> being called a coat, since it covers. Moreover at times the coat has formed after the pus has become more matured; so that what is under it cannot be drawn out by cupping. But this is readily recognized when the application of a cup causes no change. Therefore when that happens, or there is already hardening, there is no help from cupping, but as I have said elsewhere <sup>b</sup> it is whilst matter is collecting that it has to be diverted or dispersed, or else matured. In the two former contingencies no further treatment is needed. When pus has matured, if in the armpits or groins it will not often have to be cut into. The same is true when the abscess is of moderate extent, so also when it is in the skin, or even in the flesh, unless the patient's weakness forces us to hurry; it is sufficient to poultice in order to make the pus come out of its own accord. For the place which has not felt the knife may generally escape without a scar. But if the abscess is more deeply seated, we must consider whether the part has sinews or not. For if it is free from sinews, it should be laid open with a red-hot cautery-knife;

## CELSUS

gratia est, quod exigua plaga diutius ad pus evocandum patet, parvaque postea cicatrix fit. At si nervi iuxta sunt, ignis alienus est, ne vel distendantur, vel membrum debilitent: necessaria vero opera scalpelli est. Sed cetera etiam subcruda aperiri possunt: inter nervos ultima expectanda maturitas est, quae cutem extenuet eique pus iungat, quo  
5 propius reperiatur. Iamque alia rectam plagam desiderant: in pano, quia fere vehementer cutem extenuat, tota ea super pus excidenda est. Semper autem ubi scalpellus admovetur, id agendum est, ut et quam minimae et paucissimae plagae sint, cum eo tamen ut necessitati succurramus et in modo et in numero. Nam maiores sinus latius interdum etiam duabus aut tribus lineis incidendi sunt, dandaque opera, ut imus sinus exitum habeat, ne quis umor intus subsidat, qui proxima et adhuc sana erodendo  
6 sinuet. Est etiam in rerum natura, ut cutis latius excidenda sit. Nam ubi post longis morbis totus corporis habitus vitiatus est lateque se sinus suffudit et in eo iam cutis pallet, scire licet eam iam emortuam esse et inutilem futuram; ideoque excidere commodius est, maxime si circa articulos maiores id evenerit, cubantemque aegrum fluens alvus exhaurit neque per alimenta quicquam corpori accedit. Sed excidi ita debet, ut plaga ad similitudinem myrtei

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\* V. 18. 19: 28. 10.

which has this advantage, that a small wound continues open longer for the withdrawal of the pus, and the resulting scar is small. But if there are sinews near by, the cautery is unsuitable, lest spasm of the sinews ensues or paralysis of the limb; then the scalpel becomes necessary. But although abscesses elsewhere can be opened even whilst immature, where there are sinews, we must wait for them to be fully matured, since the skin then becomes thin, and the pus joins it, and so is nearer to get at. Most abscesses require a linear incision; but in that termed panus,<sup>a</sup> because it generally thins out the skin extremely, all the skin overlying the pus is to be cut away. But when the scalpel is used, care should always be taken that the incisions made are as few and as small as possible, but enough in number and extent to afford the necessary relief. For the larger cavities may at times have to be cut into rather widely even by two or three incisions, and cuts must be so made that the deepest part of the cavity gets a vent, lest any fluid should be left there to eat its way gradually into adjoining tissue, which was previously sound. Also it is natural that the skin should have to be cut away rather widely. For when the whole bodily habit has become vitiated in the course of a prolonged disease and the abscess cavity has extended widely and the skin over it has already become pallid, then we can recognize that the skin is already dead and of no further use; and therefore the excision of overlying skin is better, especially if the suppuration is round about the larger joints, and if the patient, confined to bed, has been exhausted by diarrhoea, and gained nothing from his food. But the skin should be so cut out as to

## CELSUS

folii fiat, quo facilius sanescat: idque perpetuum est, ubicumque medicus et quacumque causa cutem excidit. Pure effuso, in alis vel inguinibus, linamento opus non est sed spongia ex vino inponenda est. In ceteris partibus, si aeque linamenta supervacua sunt, purgationis causa paulum mellis infundendum, deinde glutinantia super danda: si illa necessaria sunt, super ea quoque similiter dari spongia eodem modo ex vino expressa debet. Quando autem linamentis opus sit, quando non sit, alias (V. 28. 11 E) dictum est. Cetera eadem incisa suppuratione faciendae sunt, quae, ubi per medicamenta rupta est, faciendae esse proposui (V. 28. 11 D *seqq.*).

3. Protinus autem quantum curatio efficiat, quantumque aut sperari aut timeri debeat, ex quibusdam signis intellegi potest, fereque isdem, quae in vulneribus exposita sunt (V. 26. 26). Nam bona signa sunt somnum capere, facile spirare, siti non confici, cibum non fastidire: si febricula fuit, ea vacare; itemque habere pus album leve, non foedi odoris. Mala sunt vigilia, spiritus gravitas, sitis, cibi fastidium, febris, pus nigrum aut faeculentum et foedi odoris. Item procedente curatione eruptio sanguinis, aut si, antequam sinus carne impleatur, orae carnosae fiunt, illa quoque ipsa carne hebetate nec firma. Deficere tamen animam vel ipsa curatione vel postea pessimum omnium est. Quin etiam morbus ipse sive subito solutus est, deinde suppuratio exorta est,

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<sup>a</sup> V. 28. 11 E.

<sup>b</sup> V. 28 11 D.

<sup>c</sup> V. 28. 26. Hippocrates IV. 202 (*Aphor.* VII. 44).

leave a myrtle leaf shaped wound, in order that it may heal more readily: and this should be the constant rule, whenever, or for whatever reason, the practitioner cuts out skin. Where the pus has been let out, for the armpit or groin lint plugging is unsuitable, but a sponge squeezed out of wine must be put on. In other parts, if likewise a lint plug is unnecessary, a little honey should be infused into the cavity to clean it, then agglutinants put on: if lint plugs are needed, over them also should be placed sponges similarly squeezed out of wine. But it has been said elsewhere <sup>a</sup> when plugging is, and is not requisite. In all other ways the same procedure is to be followed after an abscess has been opened by incision, which I have described for one which has ruptured under medicaments. <sup>b</sup>

3. Now how the treatment is succeeding, how much is to be either hoped or feared, can be learnt straightway from signs which on the whole are the same as have been mentioned already for wounds. <sup>c</sup> Good signs are: ready sleep, easy breathing, no harassing thirst, no aversion to food; for any feverishness to pass off; and for the pus to be white and uniform, not foul. Bad signs are: wakefulness, laboured breathing, thirst, aversion to food, fever, the pus dark or like wine lees, and foul. Again, bad signs in the course of the treatment are: haemorrhage, or if the margins become fleshy before the sinus has been filled up by flesh, and this flesh is insensitive and not firm. But the worst sign of all is a faint, whether during the dressing, or after it. Again there is some reason for anxiety when the illness suddenly subsides, and then suppuration breaks out; or if the illness persists after the pus

## CELSUS

sive effuso pure permanet, non iniuste terret. Estque inter causas timoris si sensus in vulnere rodentium non est. Sed ut haec ipsa fortuna huc illucve discernit, sic medici partium est eniti ad reperiendam  
3 sanitatem. Ergo quotiens ulcus resolverit, eluere id, si reprimendus umor videbitur, vino ex aqua pluvia[tilli mixto vel aqua, in qua lenticula cocta sit, debebit; si purgandum erit, mulso; rursusque inponere eadem. Ubi iam repressus videbitur umor, ulcusque purum erit, produci carnem conveniet, et foveri vulnus pari portione vini ac mellis, superque  
4 inponi spongiam ex vino et rosa tinctam. Per quae cum caro producat, plus tamen (ut alias [V. 26. 34 C] quoque dixi) victus ratio eo confert; id est solutis iam febribus et cibi cupiditate reddita balneum rarum, cotidiana sed lenis gestatio, cibi portionesque corpori faciundo aptae. Quae omnia per medicamenta quoque suppuratione rupta secuntur: sed quia magno malo vix sine ferro mederi licet, in hunc locum reservata sunt.

4. Adversus fistulas quoque, si altius penetrant, ut ad ultimas demitti collyrium non possit, si tortuosae sunt, si multiplices, maius in manu quam in medicamentis praesidium est; minusque operae est, si sub cute transversae feruntur, quam si rectae intus tendunt.—Igitur si sub cute transversa fistula est, demitti specillum debet, supraque ea incidi. Si flexus reperientur, hi quoque simul specillo et ferro

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<sup>a</sup> III. 1. 4.

<sup>b</sup> III. 27. 4—V. 26. 34 C.

<sup>c</sup> V. 28. 12.

has been let out. And one cause for anxiety is if the wound is insensible to corrosives. But while it is chance<sup>a</sup> that makes the signs point now one way, now another, it is the practitioner's part to strive to bring about healing. Therefore whenever it is dressed, the abscess cavity should be washed out, with wine mixed with rain water or with a decoction of lentils, when the discharge seems to need checking; with honey wine when cleaning is required; after which it is dressed as before. When the discharge appears to be checked, and the cavity clean, then is the time to help the growth of flesh, both by irrigating with equal parts of wine and honey, and by laying on a sponge soaked in wine and rose oil. Although the growth of flesh is helped by these medicaments, this is better attained, as I have said elsewhere, by a careful regimen;<sup>b</sup> this consists, after the cessation of the fever and a return of appetite, in an occasional bath, gentle rocking daily, food and drink suitable for making flesh. These prescriptions all apply to abscesses which have burst under medicaments; but they have been held over to this place because it is scarcely possible to cure a large abscess without using the knife.

4. Again, for fistulae which penetrate so deeply that a medicated bougie cannot be passed down to the ends, or those which are tortuous or multiple, surgery has the advantage over medicine;<sup>c</sup> and there is less trouble if the fistula runs horizontally under the skin, than when it tends directly inwards. Therefore if it lies horizontally under the skin, a probe should be introduced and cut down upon. When there are bends, these are followed up in

## CELSUS

persequendi; itemque faciendum, si plures se quasi  
B ramuli ostendunt. Ubi ad finis fistulae ventum est,  
excidendus ex ea totus callus est, superque fibulae  
dandae et medicamentum quo glutinetur. At si  
recta subter tendit, ubi, quo maxime ferat, specillo  
exploratum est, excidi is sinus debet; dein fibula  
oris cutis inicienda est; et aequae glutinantia  
medicamenta superdanda sunt aut, si corruptius  
ulcus est, quod interdum osse vitiato fit, ubi id quoque  
curatum est, pus moventia.

2 Solent autem inter costas fistulae subter exire;  
quod ubi incidit, eo loco costa ab utraque parte  
praecidenda et eximenda est, ne quid intus corruptum  
relinquatur. Solent, ubi costas transierunt, saeptum  
id, quod transversum a superioribus visceribus  
B intestina discernit, violare. Quod intellegi loco et  
magnitudine doloris potest, et quia<sup>1</sup> nonnumquam  
spiritus ea cum umore quasi bullante prorumpit,  
maximeque si hunc ore ille continuit. In eo medicinae  
locus nullus est. In ceteris vero, quae circa costas  
sanabilia sunt, pingua medicamenta inimica sunt;  
ceteris, quae ad vulnera adcommodantur, uti licet:  
optime tamen sicca linamenta vel, si purgandum  
aliquid videtur, in melle tincta inponuntur.

3 Ventri nullum os subest, sed ibi perniciosae ad-  
modum fistulae fiunt, adeo ut Sostratus insanabiles  
esse crediderit. Id non ex toto ita se habere usus  
ostendit. Et quidem, quod maxime mirum videri

<sup>1</sup> et quia *Daremborg following one MS. ; Marx keeps the qui of the majority and suggests (since ille follows) that some words have fallen out.*

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<sup>a</sup> V. 26. 23 B and note c.

<sup>b</sup> VIII. 2.

<sup>c</sup> IV. 1. 4.

the same way with the probe and knife; so also when they present multiple branchings. When the end of the fistula is reached, all the callus should be cut out, then pins <sup>a</sup> are inserted through the skin margin, and agglutinating medicaments spread over all. But if it runs straight inwards, after its chief direction has been explored by means of the probe, that cavity ought to be excised, then a pin is to be inserted through the skin opening, and agglutinating medicaments applied as above; or if there is more corrupt ulceration, which is at times the case when there is disease of bone, after the bone <sup>b</sup> has been treated, suppuratives are put on.

Now it is common for fistulae to have their exit between ribs; when this is the case the rib must be cut across on either side at that spot, and the segment removed lest anything diseased be left within. Fistulae which have passed between the ribs often involve the transverse septum <sup>c</sup> separating the viscera above from the intestine. This can be recognized by the position of the fistula and the severity of the pain, and because at times, air with frothy humour escapes from the fistula, especially when the patient has held his breath. In that case there is no opportunity for the medical art. But in the case of other fistulae near the ribs which are curable, greasy medicaments are objectionable but anything else which suits wounds may be used; the best, however, is lint put on dry, or after soaking in honey if anything has to be cleaned.

There is no bone in the abdomen, but all the same fistulae there are so dangerous that Sostratus thought them incurable. Experience, however, shows that this is not always the case. Indeed—and this may

## CELSUS

potest, tutior fistula est contra iecur et lienem et ventriculum quam contra intestina, non quo perniciosior ibi sit, sed quo alteri periculo locum faciat. Cuius experimento moti quidam auctores parum modum rei cognoverunt. Nam venter saepe etiam telo perforatur, prolapsaque intestina conduntur, et oras vulneris suturae comprehendunt; quod B quemadmodum fiat, mox (16) indicabo. Itaque etiam ubi tenuis fistula abdomen perrumpit, excidere eam licet suturaque oras coniungere. Si vero ea fistula intus patuit, excissa necesse est latius foramen relinquat, quod nisi magna vi, utique ab interiore parte, sui non potest; qua quasi membrana quaedam finit abdomen, quam peritoneon Graeci vocant. Ergo ubi aliquis ingredi ac moveri coepit, rumpitur illa sutura, atque intestina solvuntur; quo fit, ut pereundum homini sit. Sed non omni modo res ea desperationem habet, ideoque tenuioribus fistulis adhibenda curatio est.

- 4 Propriam etiamnum animadversionem desiderant eae, quae in ano sunt. In has demisso specillo ad ultimum eius caput incidi cutis debet, dein novo foramine specillum educi lino sequente, quod in aliam eius partem ob id ipsum perforatam coniectum sit. Ibi lino prehendum vincendumque cum altero capite est, ut laxe cutem, quae super fistulam est, teneat; idque lino debet esse crudum et duplex triplexve, sic tortum, ut unitas facta sit.

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<sup>a</sup> Prolapse of the intestines, described below, § B fin.

<sup>b</sup> VII. 16. 4.

<sup>c</sup> IV. 1. 13.

<sup>d</sup> VI. 18. 7.

seem very remarkable—a fistula which forms over the liver, spleen, or stomach, is safer than one right over the intestine, not because a fistula there is more harmful, but because it opens the way to another danger.<sup>a</sup> Some writers who have had experience of this have shown little perception of the true facts. For often the abdomen is actually penetrated by a weapon, and prolapsed intestines are replaced, and sutures bring the margins of the wound together and how this is done I will presently point out.<sup>b</sup> Therefore also when a fine fistula breaks through the abdominal wall, it is possible to cut it out, and to join its margins by suture. But if such a fistula widens out inside, its excision necessarily leaves a wide gap which cannot be sutured without applying great force especially in the deeper part where the abdomen is enclosed by a kind of membrane which the Greeks call peritoneum.<sup>c</sup> Therefore, when the patient begins to get up and move about, the sutures break, and intestines prolapse; which causes his death. But these cases are not altogether desperate, and so for the finer fistulae, treatment is to be adopted.

Special consideration is required in the case of those in the anus.<sup>d</sup> In these, where a probe has been passed up to its end, the skin should be cut through, next through this new orifice the probe is to be drawn out, followed by a linen thread which has been passed through the eye made for the purpose in the other end of the probe. Then the two ends of the linen thread are taken and knotted together so as to grip loosely the skin overlying the fistula. The linen thread should be made up of two or three strands of raw flax, twisted up so as to

## CELSUS

Interim autem licet negotia gerere, ambulare, lavari,  
B cibum capere perinde atque sanissimo. Tantummodo id linum bis die salvo nodo ducendum est, sic ut subeat fistulam pars quae superior fuit. Neque committendum est, ut id linum putrescat, sed tertio quoque die nodus resolvendus est, et ad caput alterum recens linum alligandum est eductoque veteri id in fistula cum simili nodo relinquendum. Sic enim id paulatim cutem, quae supra fistulam est, incidit; simulque et id sanescit, quod a lino relictum est et id, quod ab eo mordetur, inciditur. Haec  
C ratio curationis longa sed sine dolore est. Qui festinant, adstringere cutem lino debent, quo celerius secent, noctuque ex penicillo tenuia quaedam intus demittere, ut cutis hoc ipso extenuetur quo extenditur; sed haec dolorem movent. Adicitur celeritati sicut tormento quoque, si et linum et id, quod ex penicillo est, aliquo medicamento inlinitur ex iis, quibus callum exedi posui (V. 28. 12 I). Potest tamen fieri, ut ad scalpelli adcuracionem etiam illo loco<sup>1</sup> veniendum sit, si intus fistula fert, si multiplex  
D est. Igitur in haec genera demisso specillo duabus lineis incidenda cutis est, ut media inter eas habenula tenuis admodum eiciatur; ne protinus orae coeant, sitque locus aliquis linamentis, quae quam paucissima superinicienda sunt; omniaque eodem modo facienda, quae in abscessibus (V. 28. 11. 12) posita sunt. Si

<sup>1</sup> loco *Daremborg* following some of the MSS.; loci retained by *Marx*.

<sup>a</sup> V. 28. 12.

<sup>b</sup> V. 28. 11, 12.

make one. Meanwhile the patient can do his business, walk, bathe, and take food as if in the best of health. Only this thread is to be moved twice a day, but without undoing the knot, the part of the thread outside being drawn within the fistula, and the thread must not be left until it becomes foul, but every third day the knot is to be undone, and to one end that of another fresh thread is tied, and the old thread being withdrawn the new one is to be left in the fistula after being similarly knotted. For thus the thread cuts through the skin overlying the fistula slowly, and whilst the skin released from the thread undergoes healing, that which is still gripped is being cut through. This method of treatment is lengthy but causes no pain. Those in a hurry should constrict the skin with the thread, so that they may cut through more quickly; and at night they should insert into the fistula some fine pledglets of wool, in order that its overlying skin, being put on the stretch, may be thinned out; but these measures cause pain. More speed may be added, but more pain as well, if both the thread and the pledglets are smeared with some one of the medicaments, which I have noted for the eating away of callus.<sup>a</sup> Even here, however, the knife must be used, if the fistula extends inwards, or is multiple. In these kinds of fistulae, therefore, when the probe has been inserted, the skin is to be cut through along two lines so that between them a very fine strip of skin may be taken out, in order that the margins may not unite at once, and that there may be room for the smallest possible quantity of lint to be inserted; all the rest is done in the way described for abscesses.<sup>b</sup> If, however, from one

## CELSUS

vero ab uno ore plures sinus erunt, recta fistula scalpello erit incidenda; ab eo ceterae, quae iam patebunt, lino excipiendae. Si intus aliqua procedet, quo ferrum tuto pervenire non poterit, collyrium demittendum erit. **E** Cibus autem in eiusmodi omnibus casibus, sive manu sive medicamentis agetur, dari debet humidus, potio liberalis, diuque aqua: ubi iam caro increscit, tum demum et balineis raris utendum erit et cibis corpus implentibus.

5. Tela quoque, quae inlata corporibus intus haeserunt, magno negotio saepe eiciuntur. Suntque quaedam difficultates ex generibus eorum: quaedam ex is sedibus, in quas illa penetrarunt. Omne autem telum extrahitur aut ab ea parte, qua venit, aut ab ea, in quam tetendit. Illic viam, qua redeat, ipsum sibi fecit, hic a scalpello accipit: nam contra mucronem caro inciditur. Sed si non alte telum insedit, et in summa carne est, aut certe magnas venas et loca nervosa non transit, nihil **B** melius quam qua venit id evellere. Si vero plus est, per quod telo revertendum quam quod perrumpendum est, iamque venas nervosaeque id transit, commodius est aperire quod superest, eaque extrahere: nam et propius petitur, et tutius evellitur; et in maiore membro, si medium<sup>1</sup> mucro transit, facilius sanescit

<sup>1</sup> *So one MS. followed by Daremberg. The majority of MSS. have medius which Marx retains.*

<sup>a</sup> III. 6. 10, 17. Hippocrates IV. 106 (*Aph.* I. 16).

<sup>b</sup> Celsus here gives us the only information which we possess on the treatment of wounds in Roman warfare; the treatment which he describes was in most respects that followed by such well-known surgeons as Paulus Aegineta, Abulkasim and later Paré and Italian surgeons of the renaissance even after the introduction of gunpowder had largely altered the type of wound inflicted.

orifice several sinuses lead off, the straight part of the fistula is to be laid open with the scalpel, and the others branching from it, which are now exposed, are to be gripped by a thread. Should any fistula extend so far inwards that it cannot be safely laid open by the knife, a medicated bougie<sup>a</sup> is to be put in. But in all such cases, whether treated surgically or by medicaments, the food should be moist, the drink abundant, and for a while water: when flesh begins to grow up, then at length the patient is to make use of the bath occasionally, and of flesh-making food.

5. Missiles<sup>b</sup> too, which have entered the body and become fixed within, are often very troublesome to extract. And some of the difficulties arise from their shape, some owing to the positions to which they have penetrated. Whatever the missile may be, it is extracted, either by the wound of entry, or through the spot towards which it is pointing. In the former case, the missile has already made a way for its withdrawal; in the latter the way out is made with the scalpel; for the flesh is cut through upon its point. But if the missile is not deeply seated, and lies in superficial tissue, or if it is certain that it has not crossed the line of large blood vessels or sinews, there is nothing better than to pull it out by the way it entered. But if the distance it has to be withdrawn is greater than that which remains to be forced through, or if it has crossed the line of blood vessels and sinews, it is more convenient to lay open the rest of its course and so draw it out. For it will be more easily got at and more safely pulled out. And in the case of one of the larger limbs, if the point has passed beyond the middle, a through and through wound

## CELSUS

quod pervium est, quia utrimque medicamento  
C fovetur. Sed si retro telum recipiendum, amplianda  
scalpello plaga est, quo facilius id sequatur, quoque  
minor oriatur inflammatio; quae maior fit, si ab illo  
ipso telo, dum redit, corpus laniatur. Item si ex  
alia parte vulnus aperiatur, laxius esse debet, quam  
ut telo postea transeunte ampliatur. Summa autem  
utraque parte habenda cura est, ne vena, ne maior  
nervos, ne arteria incidatur. Quorum ubi aliquid  
detectum est, excipiendum hamo retuso est, ab-  
ducendumque a scalpello. Ubi autem satis incisum  
est, telum eximendum est, tum quoque eodem modo  
et eadem cura habita, ne sub eo, quod eximitur,  
aliquod eorum laedatur, quae tuenda esse proposui.

2 Haec communia. Sunt propria quaedam in  
singulis telorum generibus, quae protinus subiciam.  
Nihil tam facile in corpus quam sagitta conditur,  
eademque altissime insidit. Haec autem eveniunt,  
et quia magna vi fertur illa, et quia ipsa in angusto  
est. Saepius itaque ab altera parte, quam ex qua  
venit, recipienda et praecipue quia fere spiculis  
cingitur, quae magis laniant, si retrorsus quam si  
B contra eximatur. Sed inde aperta via, caro diduei  
debet ferramento ad similitudinem facto Graecae  
litterae . .<sup>1</sup> deinde, ubi apparuit, si mucroni  
harundo inhaeret, propellenda est, donec ab altera

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<sup>1</sup> *The figure of the letter has dropped out. It has been variously restored as Ψ, Λ, Υ. v.*

<sup>a</sup> II. 10. 15.

<sup>b</sup> Upsilon (Υ) seems the most probable letter to fill the lacuna (see critical note). The shape of the instrument and the method of use would then correspond to the modern glove-stretchers.

heals more easily because it can be dressed with a medicament at both ends. But if the missile is to be drawn back, the wound should be enlarged with a scalpel, for then the missile comes away more easily, also less inflammation is caused; for this becomes more severe if the missile itself lacerates the tissues while being withdrawn. So also when a counter opening is made, this ought to be too wide for the missile to fill as it is passing out. In either case, the greatest care should be taken that no vein,<sup>a</sup> nor one of the larger sinews, nor an artery, is cut. When any one of these is observed, it is to be caught by a blunt hook and held away from the scalpel. When the incision has been made large enough, the missile is to be drawn out, proceeding in the same way, and taking the same care, lest that which is being extracted should injure one of those structures which I have said are to be protected.

The foregoing are general rules; there are some rules which apply to special missiles, and these I will at once set out. Nothing penetrates so easily into the body as an arrow, and it also becomes very deeply fixed. And this happens both because it is propelled with great force and because it is sharply pointed. Hence it is more often to be extracted through a counter opening than through the wound of entry, and especially so because it is generally furnished with barbs which lacerate more when drawn backwards than if pushed through a counter opening. When a passage out has been laid open, the flesh ought to be stretched apart by an instrument like a Greek letter;<sup>b</sup> next when the point has come into view, if the shaft is still attached, it is to be pushed on until the point can be seized from

## CELSUS

adprehendi et extrahi possit; si iam illa decidit  
solumque intus ferrum est, mucro vel digitis ad-  
C prehendi vel forfice atque ita educi debet. Neque  
alia ratio extrahendi est, ubi ab ea parte, qua venit,  
evelli magis placuit: nam ampliato magis vulnere,  
aut harundo, si inest, evellenda est, aut si ea non est,  
ferrum ipsum. Quod si spicula apparuerunt eaque  
brevia et tenuia sunt, forfice ibi comminui debent,  
vacuumque ab his telum educi: si ea maiora valentio-  
raque sunt, fissis scriptoris calamis contegenda, ac  
ne quid lacerent, sic evellenda sunt. In sagittis  
quidem haec observatio est.

3 Latum vero telum si conditum est, ab altera parte  
educi non expedit, ne ingenti vulnere ipsi quoque  
ingens vulnus adiciamus. Evellendum est ergo  
genere quodam ferramenti, quod Diocleum cya-  
thiscum Graeci vocant, quoniam auctorem Dioclen  
habet; quem inter priscos maximosque medicos  
fuisse iam posui (*prohoem.* 8). Lammina vel ferrea  
vel aenea etiam ab altero capite duo utrimque  
B deorsum conversos uncas habet; ab altero duplicata  
lateribus, leviterque extrema in eam partem  
inclinata, qua sinuata est, insuper ibi etiam per-  
forata est. Haec iuxta telum transversa demittitur;  
deinde ubi ad imum mucronem ventum est, paulum  
torquetur, ut telum foramine suo excipiat. Cum in

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<sup>a</sup> Vol. I., p. 4.

<sup>b</sup> The shape and use of this instrument were similar in principle to those of the present-day midwifery forceps.

the counter opening and drawn out: if the shaft has already become detached, and only the arrow-head is within, the point should be seized by the fingers or by forceps, and so drawn out. Nor is the method of extraction different when it is preferred to withdraw the arrow by the wound of entry; the wound having been enlarged, either the shaft, if it is still attached, or, if not, the arrowhead itself, is pulled upon. When the barbs come into view, if they are short and fine, they should be nipped off on the spot by forceps, and the missile drawn out without them. If the barbs are too large and resistant for this, they must be covered by reed pens which have been split, and thus pulled out carefully so as not to tear the flesh. This is what is to be done in the case of arrows.

But if it is a broad weapon which has been embedded, it is not expedient to extract it through a counter opening, lest we add a second large wound to one already large. It is therefore to be pulled out by the aid of some such instrument as that which the Greeks call the Dioclean cyathiscus, because invented by Diocles, whom I have said already to have been among the greatest of the ancient medical men.<sup>a</sup> The instrument<sup>b</sup> consists of two iron or even copper blades, one blade has at each angle of its end a hook, turned downwards; the other blade has its sides turned up so that it forms a groove, also its end is turned up somewhat, and perforated by a hole. The latter blade is first passed up to the weapon, and then underneath it, until the point is reached, the blade is then rotated somewhat until the point becomes engaged in the perforation. After the point has entered the perforation, the

## CELSUS

cavo mucro est, ilico digiti subiecti partis alterius uncis simul et ferramentum id extrahunt et telum.

4 Tertium genus telorum est, quod interdum evelli debet; plumbea glans aut lapis aut simile aliquid, quod perrupta cute integrum intus insedit.—In omnibus his latius vulnus aperiendum, idque quod inest, ea, qua venit, forfice extrahendum est. Accedit vero aliquid difficultatis sub omni ictu, si telum vel ossi inhaesit vel in articulo se inter duo ossa demersit.

B In osse usque eo movendum est, donec laxetur is locus, qui mucronem momordit; et tunc vel manu vel forfice telum extrahendum est; quae ratio in dentibus quoque eiciendis est. Vix umquam ita telum non sequitur: sed si morabitur, excuti quoque ictum aliquo ferramento poterit. Ultimum est, ubi non evellitur, terebra iuxta forare, ab eoque foramine ad speciem litterae<sup>1</sup> vel contra telum os excidere sic, ut lineae, quae diducuntur, ad telum spectent; eo facto id necesse est labet et facile C auferatur. Inter duo vero ossa si per ipsum articulum perruperit, circa vulnus duo membra fascis habenisve deliganda et per has in diversas partes diducenda sunt, ut nervos distendant; quibus extentis laxius inter ossa spatium est, ut sine difficultate telum recipiatur. Illud videndum est, sicut in aliis locis (1 C) posui, ne quis nervus aut vena aut arteria a telo laedatur, dum

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<sup>1</sup> *The figure of the letter is omitted; probably vel has taken its place. Targa reads V, and this is rendered; other suggestions are Ψ or v.*

<sup>2</sup> *The glans was in shape like an acorn, pointed at one end, which travelled point forwards and penetrated by the point, like the modern bullet.*

<sup>b</sup> VII. 12. 1 A.

hooks of the first mentioned blade are fitted by the aid of the fingers over the upturned end of the blade already passed, after which simultaneously the cyathiscus and the weapon are withdrawn.

There is a third kind of missile which at times has to be extracted such as a lead ball,<sup>a</sup> or a pebble, or such like, which has penetrated the skin and become fixed within unbroken. In all such cases the wound should be laid open freely, and the retained object pulled out by forceps the way it entered. But some difficulty is added in the case of any injury in which a missile has become fixed in bone, or in a joint between the ends of two bones. When in a bone, the missile is swayed until the place which grips the point yields, after which it is extracted by the hand, or by forceps; this is the method also used in extracting teeth.<sup>b</sup> In this way the missile nearly always comes out, but if it resists, it can be dislodged by striking it with some instrument. The last resort when it cannot be pulled out, is to bore into the bone with a trepan close by the missile, and from that hole to cut away the bone in the shape of the letter V, so that the lines of the letter which diverge to either side face the missile; after that it is necessarily loosened and easily removed. If the missile has forced its way actually into a joint between the ends of two bones, the limbs above and below are encircled by bandages or straps, by means of which they are pulled in opposite directions, so that the sinews are put on the stretch; the space between the ends of the bone is widened by these extensions, so that the missile is without difficulty withdrawn. In doing this care must be taken, as mentioned elsewhere, to avoid injury to a sinew, vein or artery

## CELSUS

id extrahitur, eadem scilicet ratione, quae supra posita est (1 C).

5 At si venenato quoque telo quis ictus est, iisdem omnibus, si fieri potest, etiam festinantius actis, adicienda curatio est, quae vel epoto veneno, vel a serpente ictis adhibetur. Vulneris autem ipsius extracto telo medicina non alia est, quam quae esset, si corpore icto nihil inhaesisset; de qua satis alio loco (V. 26. 21 *seqq.*) dictum est.

6. Haec evenire in qualibet parte corporis possunt: reliqua certas sedes habent, de quibus dicam orsus a capite. In hoc multa variaque tubercula oriuntur: ganglia, meliceridas, atheromata nominant aliisque etiamnum vocabulis quaedam alii discernunt, quibus ego steatomata quoque adiciam. Quae quamvis et in cervice et in alis et in lateribus oriri solent, per se tamen non posui, cum omnia ista mediocres differentias habeant, ac neque periculo terreant  
2 neque diverso genere curentur. Omnia vero ista et ex parvulo incipiunt et diu paulatimque increscunt, et tunica sua includuntur. Quaedam ex his dura ac renitentia, quaedam mollia cedentiaque sunt; quaedam spatio nudantur, quaedam tecta capillo suo permanent; fereque sine dolore sunt. Quid intus habeant, ut coniectura praesagiri potest, sic ex toto cognosci, nisi cum eiecta sunt, non potest. Maxime tamen in iis, quae renitentur, aut lapillis quaedam similia aut concreti confersique pili reperiuntur: in iis vero, quae cedunt, aut melli simile

<sup>a</sup> VII. 5. 1 C.

<sup>b</sup> V. 27.

<sup>c</sup> V. 26. 21 *et seq.*

<sup>d</sup> Dermoid cysts or wens. The ganglion was named from its resemblance to the resistant swelling of tendon sheaths which is still so called; the other varieties from the nature of their contents, like honeycomb (*μελικτήριον*), porridge (*ἀθήρη*), or fat (*στέαρ*) respectively.

while the weapon is being extracted by the same method which was described above.<sup>a</sup>

But if the missile is also poisoned, after doing all the same things, even more promptly, if possible, in addition the treatment is to be applied which is given for one who has drunk poison, or has been bitten by a snake.<sup>b</sup> The care of the wound itself after the extraction of the missile does not differ from that of a wound in which nothing has lodged and on which I have said enough elsewhere.<sup>c</sup>

6. Such are lesions which can arise in any part of the body; the remainder occur in special situations, of these I am going to speak, beginning with the head. On the head many kinds of small tumours<sup>d</sup> occur; besides those called ganglia, melicerides and atheromata, different authorities distinguish certain sorts by different names, and to these I myself will add one, steatoma. Although these tend to occur both in the neck and in the armpits and flanks, yet I have not dealt with them separately for there is little difference among them and none of them are dangerous and all are treated in the same way. Now all the above start from a very small beginning and grow slowly for a long time and have a coat of their own to enclose them. Some of them are hard and resistant, some soft and yielding; some become partially bald, others continue to be covered by their proper hair; generally they are painless. What they contain can be surmised, but cannot be fully known until the contents have been turned out. Generally, however, in those which are resistant, we find something like little stones, or balls of compressed hair; and in those which are yielding either some material similar to honey or thin

## CELSUS

aliquid aut tenui pulticulæ aut quasi rassæ cartilagini aut carni hebeti et eurentæ, quibus ali aliq<sup>ue</sup> 3 colores esse consuerunt. Fereque ganglia renituntur: atheromati subest quasi tenuis pulticula: meliceridi liquidior umor, ideoque pressus circumfluit: steatomati pingue quiddam. Idque latissime patere consuevit, resolvitque totam cutem superpositam sic, ut ea labet, cum in ceteris sit adstrictior. Omnia derassa ante si capillis conteguntur, per medium oportet incidi: sed steatomatis tunica quoque secanda est, ut effundatur quicquid intus coit, quia non facile a cute et subiecta carne ea separatur: in ceteris ipsa tunica inuolata servanda 4 est. Protinus autem ut alba et intenta se ostendit, tum scalpelli manubriolo deducenda a cute et carne est, eiciendaque cum eo, quod intus tenet. Si quando tamen ab inferiore parte tunicæ musculus inhaesit, ne is laedatur, superior pars illius decidenda; at ima ibi relinquenda est. Ubi tota exempta est, committendæ oræ, fibulaque his inicienda, et super medicamentum glutinans dandum est. Ubi vel tota tunica vel aliquid ex ea relictum est, pus moventia adhibenda sunt.

7. Sed ut hæc neque genere viti neque ratione curationis inter se multum distant, sic in oculis, quæ manum postulant, et ipsa diversa sunt et aliter aliterque curantur. Igitur in superioribus palpebris vesicæ nasci solent pingues gravesque, quæ vix attollere oculos sinunt, levesque pituitæ cursus sed

porridge or something like grazed cartilage or bruised and bloody flesh, and the contents generally vary in colour. Ganglia are mostly resistant; atheromata have porridge-like contents; meliceris has a more fluid humour, and so it fluctuates when pressed upon; a steatoma contains a kind of fat. This last spreads most widely and loosens all the skin over it so that it is flaccid, although in the others the skin is more tense. All parts covered by hair should be shaved first and the incision made across the middle; but the coat of a steatoma is also to be cut into in order to let out whatever has collected within, because it is not easy to separate the coat from the skin and underlying flesh; in the other kinds the coating is to be preserved entire.<sup>a</sup> Then as soon as the white and tight coat is seen, it is to be separated from the skin and flesh by the handle of the scalpel, and turned out together with its contents. But if muscle adheres to the deeper part of the tunic, lest it should be injured, only the superficial part of the tunic is to be cut away, and the deeper part left in position. When the whole has been removed the margins of the incision are to be brought together, a pin passed through them and, over this, an agglutinating medicament applied. When the whole, or any part of the coat has been left, suppuratives must be applied.

7. But whilst the preceding kinds of lesion do not differ much among themselves or in the mode of treatment, those in the eyes which demand surgical measures are different from each other and differently treated. For instance in the upper eyelid cysts are apt to be formed, fatty and weighty, which hardly allow the eyes to be raised, and they set up

## CELSUS

adsiduos in oculis movent: fere vero in pueris nascuntur.—Oportet compresso digitis duobus oculo atque ita cute intenta scalpello transversam lineam incidere, suspensa leviter manu, ne vesica ipsa vulneretur; ubi locus ei patefactus est, ipsa prorumpit. Tum digitis eam adprehendere oportet et evellere; facile autem sequitur. Dein superinungui collyrio debet ex iis aliquo, quo lippientes oculi superinunguntur; paucissimisque diebus cicatricula inducitur. Molestius est, ubi incisa vesica est: effundit enim umorem, neque postea, quia tenuis admodum est, potest colligi. Si forte id incidit, eorum aliquid inponendum est, quae puri movendo sunt.

2 In eadem palpebra supra pilorum locum tuberculum parvulum nascitur, quod a similitudine hordei a Graecis crithe nominatur. Tunica quiddam, quod difficulter maturescit, comprehensum est; id vel calido pane vel cera subinde calfacta foveri oportet sic, ne nimius is calor sit sed facile ea parte sustineatur: hac enim ratione saepe discutitur, interdum concoquitur. Si pus se ostendit, scalpello dividi debet, et quicquid intus umoris est, exprimi; eodem deinde vapore postea quoque foveri et superinungui, donec ad sanitatem perveniat.

3 Alia quoque quaedam in palpebris huic non dissimilia oriuntur: sed neque utique figurae eisdem, et mobilia simul atque digito vel huc vel illuc

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\* Crithe (*κριθή*) resembled a grain of pearl (peeled) barley, it is now commonly known as a Meibomian cyst, which when it becomes inflamed forms a styne.

a slight but persistent discharge of rheum from the eyes; and these generally occur in children. When the eyeball has been pressed with two fingers so as to render the skin of the upper eyelid tense, a transverse linear incision is to be made with a scalpel, with so light a touch that the cyst itself is not cut into; when the way is opened it protrudes of itself. It should then be seized with the fingers and taken out, for it comes away easily. One of the ointments, with which running eyes are anointed, is then smeared on, and in a very few days a fine scar is induced. There is more trouble when the cyst has been cut into, for it lets out a humour, and afterwards, because it is very thin, it cannot be laid hold of. Should this chance to happen, something to promote suppuration should be applied.

A very small tumour forms in the same upper eyelid, above the line of the eyelashes, which from its resemblance to a barleycorn<sup>a</sup> is termed by the Greeks *crithé*. Its contents are slow to come to a head and contained within a coat; it should be fomented with hot bread or with wax gently heated, but not so hot that it cannot easily be borne by that part; for under this treatment it is often dispersed, but at times it matures. When pus shows itself, it should be cut across with a scalpel and any humour inside squeezed out; then the eyelid is afterwards also to be fomented as above by steam,<sup>b</sup> and ointment applied until it heals.

Other tumours also, not unlike these, form on the eyelids; but they are not quite the same shape and are mobile, so that they can be pushed about

<sup>b</sup> Eodem vapore, .i.e. by steam from the wax mentioned above.

## CELSUS

inpelluntur; ideoque ea chalazia Graeci vocant.— Haec incidi debent, si sub cute sunt, ab exteriori parte; si sub cartilagine, ab interiori; deinde scalpelli manubriolo deducenda ab integris partibus sunt. Ac, si intus plaga est, inunguendum primum lenibus, deinde acrioribus; si extra, superdandum emplastrum, quo id glutinetur.

4 Unguis vero, quod pterygion Graeci vocant, est membranula nervosa oriens ab angulo, quae nonnumquam ad pupillam quoque pervenit, eique officit; saepius a narium, interdum etiam a temporum parte nascitur. Hunc recentem non difficile est discutere medicamentis, quibus cicatrices in oculis extenuantur: si inveteravit iamque ei crassitudo quoque accessit, excidi debet. Post abstinentiam vero unius diei vel adversus in sedili contra medicum is homo collocandus est, vel sic aversus, ut in gremium eius caput resupinus effundat.

B Quidam, si in sinistro oculo vitium est, adversum; si in dextro, resupinum collocari volunt. Alteram autem palpebram a ministro deduci oportet, alteram a medico: sed ab hoc, si ille adversus est, inferiorem; si supinus, superiorem. Tum idem medicus hamulum acutum, paululum mucrone intus recurvato, subicere extremo ungui debet, eumque infigere, atque eam quoque palpebram tradere alteri; ipse hamulo adprehenso levare unguem, eumque acutius trahente; deinde acum ponere, lini

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<sup>a</sup> Hail-stones. When above the tarsal cartilage these are called dermoid cysts; when beneath it Meibomian cysts.

<sup>b</sup> An inflammatory swelling at the inner canthus or angle of the lower lid which is still called a pterygium. Celsus also applied the name to a paronychia, whitlow (VI. 19. 1, note).

<sup>c</sup> VI. 6. 25 B.

with the finger; and so the Greeks call them chalazia.<sup>a</sup> They should be cut down upon, from the outside if under the skin, from the inside if under the cartilage, then separated from the sound tissue by the handle of the scalpel. If the cut is on the inner surface, first mild, then more acrid ointment is to be applied; if on the outer, an agglutinating plaster is put on.

An *unguis*<sup>b</sup> too, called pterygium in Greek, is a little fibrous membrane, springing from the angle of the eye which sometimes even spreads so as to block the pupil. Most often it arises from the side of the nose, but sometimes from the temporal angle. When recent it is not difficult to disperse by the medicaments which thin away corneal opacities;<sup>c</sup> if it is of long standing, and thick, it should be excised. After fasting for a day, the patient is either seated facing the surgeon,<sup>d</sup> or turned away, so that he lies on his back, his head in the surgeon's lap. Some want him facing if the disease is in the left eye and lying down if in the right. Now one eyelid must be held open by the assistant, the other by the surgeon; but he holds the lower lid when seated opposite the patient, and the upper when the patient is on his back. Thereupon the surgeon passes a sharp hook, the point of which has been a little incurved, under the edge of the pterygium and fixes the hook in it; next, leaving that eyelid also to the assistant, he draws the hook towards himself thus lifting up the pterygium, and passes through it a needle carrying a thread; then having detached the needle, he takes hold of the two

<sup>a</sup> The surgeon must be able to use his right hand in a good light on the affected eye without his hand blocking the light. Hence the two positions.

## CELSUS

duo capita adprehendere, et per ea erecto ungue, si qua parte oculo inhaeret, manubriolo scalpelli deducere, donec ad angulum veniat; deinde invicem modo remittere, modo adtrahere, ut sic et initium C eius et finis anguli reperiatur. Duplex enim periculum est, ne vel ex ungue aliquid relinquatur, quod exulceratum vix ullam recipiat curationem; vel ex angulo quoque caruncula abscidatur; quae, si vehementius unguis ducitur, sequitur ideoque decipit: abscisa patefit foramen, per quod postea semper umor descendit: rhyada Graeci vocant. Verus ergo anguli finis utique noscendus est; qui ubi satis constitit, non nimium adducto ungue scalpellus adhibendus est, deinde excidenda ea D membranula, ne quid ex angulo laedatur. Eodem inde ex melle linamentum superdandum est supraque linteolum, et aut spongia aut lana sucida; proximisque diebus deducendus cotidie oculus est, ne cicatrice inter se palpebrae glutinentur, siquidem id quoque tertium periculum accedit; eodemque modo linamentum inponendum, ac novissime in- unguendum collyrio, quo ulcera ad cicatricem perducuntur. Sed ea curatio vere esse debet aut certe ante hiemem; de qua re ad plura loca per- E tinente semel dixisse satis erit. Nam duo genera curationum sunt. Alia, in quibus eligere tempus non licet, sed utendum est eo, quod incidit, sicut in vulneribus [in fistulis]; alia, in quibus nullus dies

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<sup>a</sup> Rhyas (ῥύας) here is used of a lacrimal fistula but in VII. 26. 2 I of a perineal fistula formed after lithotomy.

<sup>b</sup> Cf. p. 332, note b.

ends of the thread, and raises up the pterygium by means of the thread; he now separates any part of it which adheres to the eyeball by the handle of the scalpel until the angle is reached; next by alternately pulling and slackening the thread, he is able to discover the beginning of the pterygium and the end of the angle. For there is double danger, that either some of the pterygium is left behind and if this ulcerates, it is hardly ever amenable to treatment; or that with it part of the flesh is cut away from the angle; and if the pterygium is pulled too strongly, the flesh follows unnoticed, and when it is cut away a hole is left through which there is afterwards a persistent flow of rheum; the Greeks name it rhyas.<sup>a</sup> Therefore the true edge of the angle must certainly be observed; and when this has been clearly determined, after the pterygium has been drawn forward just enough, the scalpel is to be used, then that little membrane is to be so cut away as not to injure the angle in any way. After that, lint soaked in honey is to be put on, and over that a piece of linen, and either a sponge or unscoured wool; and for the next few days the eye must be opened daily to prevent the eyelids uniting by a scar for if that happens a third danger<sup>b</sup> is added; and the lint is to be put on again, and last of all one of the salves applied which help wounds to heal. But this treatment ought to be in the spring, or certainly before winter; this warning applies to many cases, and it will be enough to give it here once for all. For there are two classes of treatment: one in which we cannot choose the time but must make the best of things, as in the case of wounds; the other in which there is no urgency and

## CELSUS

urguet, et expectare tutissimum [facile] est, sicut evenit in is, quae et tarde crescunt et dolore non cruciant. In his ver expectandum est, aut si quid magis pressit, melior tamen autumnus est quam aestas aut hiemps, atque is ipse medius, iam fractis aestibus, nondum ortis frigoribus. Quo magis autem necessaria pars erit, quae tractabitur, hoc quoque maiori periculo subiecta est; et saepe, quo maior plaga facienda, eo magis haec temporis ratio servabitur.

5 Ex curatione vero unguis, ut dixi (4 C), vitia nascuntur, quae ipsa aliis quoque de causis oriri solent. Interdum enim fit in angulo, parum ungue exciso vel aliter, tuberculum, quod palpebras parum deduci patitur: encanthis Graece nominatur. Excipi hamulo et circumcidi debet, hic quoque diligenter temperata manu, ne quod ex ipso angulo abscidat. Tum exiguum linamentum respergendum est vel cadmia vel atramento sutorio, inque eum angulum deductis palpebris inserendum, supraque eodem modo deligandum, proximisque diebus similiter nutriendum, tantum ut primis aqua egelida vel etiam frigida foveatur.

6 Interdum inter se palpebrae coalescunt aperiri non potest oculis. Cui malo solet etiam illud accedere, ut palpebrae cum albo oculi cohaerescant, scilicet cum in utroque fuit ulcus neclegenter curatum: sanescendo enim quod diduci potuit et debuit, glutinavit: ancyloblepharus<sup>1</sup> † sub utroque vitio Graeci vocant. Palpebrae tantum inter se co-

<sup>1</sup> *Marx inserts laborantes after ancyloblepharus.*

<sup>a</sup> ἐγκανθίς in the angle of the eye (κανθός).

<sup>b</sup> ἀγκυλοβλέφαροι, patients with contracted eyelids, cf. V. 18. 28, where the adjective ἀγκύλος is applied to contracted joints.

it is safest to wait, for example when the affection progresses slowly and the patient is not racked by pain. Then we should wait for spring, or if there is more urgency, autumn is better than either summer or winter, and especially mid-autumn when the hot weather has broken and the cold not yet begun. The more essential the part to be treated, the greater the danger; and often the larger the wound to be made, the more regard should thus be paid to the season.

In the course of treating pterygium, lesions arise, as I have just said, which are also apt to arise from other causes. Sometimes when the pterygium has not been quite cut away or from some other cause, a small tumour, called by the Greeks *encanthis*,<sup>a</sup> forms at the angle and this does not allow the eyelids to be completely drawn down. It should be caught up with a hook and cut round, but with so delicate a touch that nothing is cut away from the angle itself. A bit of lint is then besprinkled with oxide of zinc or blacking, and inserted into that angle after separating the lids, and over this the dressing as above is bandaged on. Upon the following days, the eye is dressed in the same way, after having been fomented with tepid, or even with cold water.

At times the eyelids adhere together, and the eye cannot be opened. When this happens, the eyelids commonly adhere to the white of the eye, that is to say, when an ulceration upon either has been carelessly treated; for in the course of healing what could and should have been kept apart has been allowed to stick: the Greeks give the name of *ancyloblepharus*<sup>b</sup> to one who suffers from both lesions. When the eyelids only stick together they

## CELSUS

- haerentes non difficulter diducuntur, sed interdum frustra: nam rursus glutinantur. Experiri tamen oportet, quia bene res saepius cedit. Igitur aversum specillum inserendum, diducendaeque eo palpebrae sunt; deinde exigua penicilla interponenda, donec exulceratio eius loci finiatur. At ubi albo ipsius oculi palpebra inhaesit, Heraclides Tarentinus auctor est adverso scalpello subsecare cum magna moderatione, ut neque ex oculo neque ex palpebra quicquam abscidatur; ac si necesse est, ex palpebra potius.
- C Post haec inunguatur oculus medicamentis, quibus aspritudo curatur; cottidieque palpebra vertatur, non solum ut ulceri medicamentum inducatur, sed etiam ne rursus inhaereat; ipsique etiam praecipiat, ut saepe eam digitis duobus attollat. Ego sic restitutum esse neminem memini. Meges se quoque multa temptasse, neque umquam profuisse, quia semper iterum oculo palpebra inhaeserit, memoriae prodidit.
- 7 Etiamnum in angulo, qui naribus propior est, ex aliquo vitio quasi parva fistula aperitur, per quam pituita adsidue destillat: aegilopa Graeci vocant. Idque adsidue male habet oculum; nonnumquam etiam exosso osse usque nares penetrat. Atque interdum naturam carcinomatis habet, ubi intentae venae et arquatae<sup>1</sup> sunt, color pallet, cutis dura est et levi tactu nritatur, inflammationemque in eas partes, quae coniunctae sunt, evocat.—Ex his eos,

<sup>1</sup> arquatae (*jaundiced*, cf. *Celsus*, II. 8. 34, III. 24. 1) is *Marx's emendation for the aequatae of the best MSS.; one MS. followed by Daremberg has recurvatae.*

<sup>a</sup> VI. 6. 27.

<sup>b</sup> Aegilops, "goat eye" (αἴξ); in ruminants, goats, deer, etc., there is a gland below the inner canthus discharging mucus.

are separated without difficulty, but sometimes this is useless for they stick together again. Separation should be tried, however, because it is generally a success. The reverse end of a probe is to be inserted and the eyelids separated by this, then small pledglets of wool are put in until ulceration of the part has ceased. But when an eyelid adheres to the white of the eye itself, Heraclides of Tarentum invented the method of cutting underneath the eyelid with the knife held, but very carefully, so that nothing is cut away, either from the eyeball, or from the eyelid, and if something must be, rather from the eyelid. The eyeball should afterwards be anointed with the medicaments with which trachoma is treated;<sup>a</sup> and the eyelid turned up every day, not only that the medicament may be applied to the ulceration, but also lest the eyelid should adhere again; moreover the patient himself should be told to raise his eyelid frequently with two fingers. I for my part do not remember anyone to have been cured by this method. Meges also has recorded that he tried many times, but was never successful, for the eyelid has always again become adherent to the eyeball.

Again, at the angle next to the nostrils, there opens a sort of small fistula, due to some lesion, through which rheum persistently drips; the Greeks call it *aigilops*.<sup>b</sup> This causes a persistent eye trouble; sometimes it even eats away the bone, and penetrates to the nostril. And at times it has the character of a carcinoma when the veins become distended and look jaundiced, the skin livid, hard and irritable to the slightest touch, and it gives rise to inflammation in the parts near to it. Of

## CELSUS

qui quasi carcinoma habent, curare periculosum est: nam mortem quoque ea res maturat; eos vero quibus ad nares tendit, supervacuum: neque enim sanescunt. At quibus id in angulo est, potest adhiberi curatio, cum eo ne ignotum sit esse difficilem: quantoque angulo propius id foramen est, tanto difficilior est, quoniam perangustum est, in C quo versari manus possit. Recenti tamen re mederi facilius est. Sed hamulo summum eius foraminis excipiendum; deinde totum id cavum, sicut in fistulis (*cap.* iv, 1) dixi, usque ad os excidendum; oculoque et ceteris iunctis partibus bene obtectis, os ferramento adurendum est; vehementiusque si iam carie vexatum est, quo crassior squama abscedat. Quidam adurentia inponunt, ut atramentum sutorium vel chalcitidem vel aeruginem rasam; quod et tardius et non idem facit. Osse adusto curatio sequitur eadem, quae in ceteris ustis.

8 Pili vero, qui in palpebris sunt, duabus de causis oculum irritare consuerunt: nam modo palpebrae [superioris] summa cutis relaxatur et procidit; quo fit, ut eius pili ad ipsum oculum convertantur, quia non simul cartilago quoque se remisit; modo sub ordine naturali pilorum alius ordo subcrescit, qui protinus intus ad oculum tendit.—Curationes hae B sunt. Si pili nati sunt, qui non debuerunt, tenuis acus ferrea ad similitudinem hastae lata in ignem coicienda est; deinde candens, sublata palpebra sic, ut eius perniciosi pili in conspectum curantis veniant,

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<sup>a</sup> Carcinoma. See V. 28. 2 A, C, D, also VII. 14. 1, 3, where treatment is said often to make the condition more dangerous; see Appendix I. p. 592.

<sup>b</sup> VII. 4. 1 B.

these affections it is dangerous to treat those which resemble carcinoma, for that even hastens <sup>a</sup> death. Again, it is useless to treat those which penetrate to the nostrils for they never heal. But when limited to the angle, treatment is possible so long as we do not forget that it is difficult. The nearer the opening to the angle, the greater the difficulty, on account of the very narrow space for handling the lesion. When the trouble is fresh, however, cure is easier. Now the margin of the opening is to be caught up by a hook, then as I have described for fistula in general <sup>b</sup> the whole channel down to the bone is to be excised; and the eye and adjacent parts having been well covered over, the bone is to be cauterized; and more thoroughly when there is already decay, in order that a thicker scale may separate. Some apply caustics, such as cobbler's blacking or bronze or copper filings, which act more slowly, and do not have the same effect. After cauterization of the bone, the same treatment is followed as in other burns.

The eyelashes also may irritate the eye from two causes: one is that the skin on the outer surface of the eyelid becomes relaxed and slips downwards, causing its eyelashes to be turned inwards against the eyeball because the cartilage does not simultaneously give way; in the other case, beyond the natural row of eyelashes another row sprouts out, which is directed straight inwards against the eyeball. The following are the modes of treatment. If eyelashes have grown where they ought not, a fine iron needle flattened like a spear point is put into the fire; then when the eyelid is turned up, so that the offending eyelashes can be seen by

sub ipsis pilorum radicibus ab angulo inmittenda est, ut ea tertiam partem palpebrae transuat; deinde iterum tertioque usque ad alterum angulum; quo fit, ut omnes pilorum radices adustae emoriantur. Tum superinponendum medicamentum est, quod inflammationem prohibeat, atque ubi crustae exciderunt, ad cicatricem perducendum. Facillime autem id genus sanescit. Quidam aiunt acu transi iuxta pilos in exteriorem partem palpebrae oportere eamque transmitti duplicem capillum muliebrem ducentem; atque ubi acus transit, in ipsius capilli sinum, qua duplicatur, pilum esse coiciendum et per eum in superiorem palpebrae partem adtrahendum; ibique corpori adglutinandum; et inponendum medicamentum, quo foramen glutinetur: sic enim fore, ut is pilus in exteriorem partem postea spectet.

D Id primum fieri non potest, nisi in pilo longiore, cum fere breves eo loco nascantur; deinde si plures pili sunt, necesse est longum tormentum totiens acus traiecta magnamque inflammationem moveat. Novissime cum umor aliquis ibi subsit, oculo et ante per pilos et tum per palpebrae foramina adfecto vix fieri potest, ut gluten, quo vinctus est pilus, non resolvatur; coque fit, ut is eo, unde vi abductus

E est, redeat. Ea vero curatio, quae [palpebrae laxioris] ab omnibus frequentatur, nihil habet dubii: siquidem oportet contacto oculo mediam palpebrae

the operator, the red hot needle is passed along their roots, from the angle, for a third of the length of the eyelid, then for a second and for a third time, until the opposite angle is reached; this causes all the roots of the eyelashes so cauterized to die. A medicament is then applied to check inflammation, and when the crusts have become detached, cicatrization is to be induced. This kind of trouble is very easily cured. Some say that a needle carrying a doubled-up hair from a woman's head should be passed through the eyelid from within outwards close to the eyelashes, and where the needle has passed through, an eyelash is to be inserted into the loop of the said hair where doubled, and the eyelash drawn by the loop through to the outer surface of the eyelid; there it is to be glued down; and a medicament is then applied to agglutinate the puncture; thus it comes about that afterwards that eyelash is directed outwards. But in the first place this cannot be done unless the eyelash is rather long, and in this situation they are generally short; further, when numerous eyelashes are affected, the passing of a needle so many times is necessarily a prolonged torture, and it may set up severe inflammation. Lastly, when there is any rheum subsisting there, and the eye has been irritated previously by the eyelashes, and now by the perforation through the eyelid, it is scarcely possible that the glue binding down the eyelash should not be dissolved; and so it comes to pass that the eyelash returns to the position from which it was forcibly removed. But there is no doubt about the following treatment [of too lax an eyelid], which is commonly practised by everybody. It is necessary to close the eye and

## CELSUS

cutem, sive ea superior sive inferior est, adprehendere digitis ac sic levare; tum considerare, quantulo detracto futurum sit, ut naturaliter se habeat. Siquidem hic quoque duo pericula circumstant: si nimium fuerit excisum, ne contegi oculus non possit; si parum, ne nihil actum sit, et frustra sectus  
F aliquis sit. Qua deinde incidendum videbitur, per duas lineas atramento notandum est sic, ut inter oram, quae pilos continet, et propiorem ei lineam aliquid relinquatur, quod adprehendere acus postea possit. His constitutis scalpellus adhibendus est; et si superior palpebra, ante; si inferior, postea propius ipsis pilis incidendum; initiumque faciendum in sinistro oculo ab eo angulo, qui tempori; in dextro ab eo, qui naribus propior est; idque, quod inter duas  
G lineas est, excidendum. Deinde orae vulneris inter se simplici sutura committendae, operiendusque oculus et si parum palpebra descendet, laxanda sutura; si nimium, aut adstringenda, aut etiam rursus tenuis habenula est ab ulteriore ora excidenda. Ubi secta est, aliae suturae adiciendae, quae supra tres esse non debent. Praeter haec in superiore palpebra sub pilis ipsis incidenda linea est, uti ab inferiore parte deducti pili susum spectent; idque, si levis inclinatio est, etiam solum satis tuetur;  
H inferior palpebra eo non eget. His factis, spongia

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\* *i.e.* the eyelid marked and the patient on his back with his head in the surgeon's lap.

from the middle, either of the upper or the lower eyelid, to seize a fold of skin between a finger and thumb, and so to raise it; then consider how much must be removed for the lid to be in a natural position for the future. In this too there are two dangers; that if too much has been excised the eyeball cannot be covered, if too little nothing has been gained, and a patient has been cut to no purpose. Next where it is seen that the incision is to be made, a mark must be made by two lines of ink, but in such a way that between the margin holding the eyelashes, and the marked line adjacent, there remains skin enough for a needle afterwards to take up. When everything is ready <sup>a</sup> the scalpel is to be applied; and the incision nearer the eyelashes themselves is to be made first in the case of the upper lid, but second for the lower one; in the case of the left eye, the incision is made from the outer angle; of the right eye from the inner one; then the skin between the two incisions is to be excised. Next the edges of the wound are to be brought into apposition by one stitch, and the eye is to be closed and if the eyelid descends too little the suture is slackened, if too much, either the suture is tightened, or even an additional fine strip may be excised from the margin furthest from the eyelashes. Where the eyelid has been cut other sutures may be put in but not more than three. Further, in the case of the upper lid, a linear incision is to be made under the row of eyelashes itself, so that these having been drawn away from under are directed upwards, and when there is but a slight drooping of the upper lid, this alone may suffice; the lower lid does not need the additional incision. When these things

## CELSUS

ex aqua frigida expressa super deliganda est. Postero die glutinans emplastrum iniciendum, quarto suturae tollendae, et collyrio, quod inflammationes reprimit, superinungendum.

- 9 Nonnumquam autem nimium sub hac curatione excisa cute evenit, ut oculus non tegatur; idque interdum etiam alia de causa fit: lagophthalmus Graeci appellant. In quo si nimium palpebrae deest, nulla id restituere curatio potest; si exiguum, mederi licet.—Paulum infra supercilium cutis incidenda est lunata figura cornibus eius deorsum **B** spectantibus. Altitudo esse plagae usque ad cartilaginem debet ipsa illa nihil laesa: nam si ea incisa est, palpebra concidit, neque attolli postea potest. Cute igitur tantum diducta fit, ut paulum in ima oculi ora descendat hiante scilicet super plaga; in quam linamentum coiciendum est, quod et coniungi diductam cutem prohibeat et in medio carunculam citet; quae ubi eum locum inplevit. postea recte oculus operitur.
- 10 Ut superioris autem palpebrae vitium est, quo parum descendit ideoque oculum non contegit, sic inferioris, quo parum susum attollitur, sed pendet et hiat, neque potest cum superiore committi. Atque id quoque evenit interdum ex simili vitio curationis, interdum etiam senectute: ectropion Graeci nomin-

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<sup>a</sup> VII. 7. 8 E.

<sup>b</sup> *λαγώφθαλμος*, from the likeness to the widely opened eye of the frightened hare.

<sup>c</sup> Cf. § 9.

<sup>d</sup> *ἐκτρόπιον* = eversion (of the lower eyelid in particular).

have been done, a sponge squeezed out of cold water is bandaged on. The next day an agglutinating plaster is applied; on the fourth day the sutures are taken out, and a salve for repressing inflammation smeared on.

But in the course of the above treatment it sometimes happens that when too much skin has been excised,<sup>a</sup> the eyeball is not covered; and occasionally this also occurs from some other cause: the Greeks call the condition lagophthalmus.<sup>b</sup> If too much of the eyelid is lost, no treatment can restore it; if a small loss it may be remedied. Just below the eyebrow the skin is to be incised in the figure of a crescent with the horns pointing downwards. The incision should reach as far as the cartilage without injuring it; for should the cartilage be cut into, the eyelid will droop, and cannot afterwards be raised. Therefore if the skin is merely drawn apart, it follows that the bottom of the eyelid droops slightly because of the gap made by the cut above; into this gap lint is to be inserted, both to prevent the separated edges from reuniting, and to help the growth of the flesh between, so that the eyeball comes to be properly covered when the gap has filled up.

Whilst a defect in the upper eyelid is that it descends too little and so does not cover the eyeball, sometimes the lower lid is not raised enough but hangs down and gapes open, and cannot reach the upper lid. And this, too, happens sometimes from the defective treatment described above,<sup>c</sup> sometimes from old age: the Greeks call it ectropion.<sup>d</sup>

In extant Greek writers the word in this sense is first found in Galen, writing 150 years later (XIX. 439).

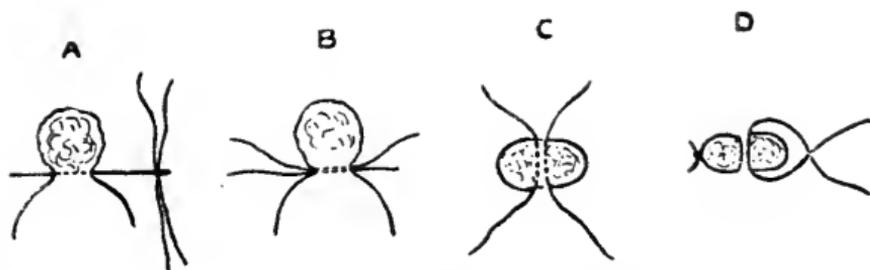
## CELSUS

ant.—Si ex mala curatione est, eadem ratio medicinae est, quae supra (9) posita est; plagae tantum cornua ad maxillas, non ad oculum convertenda sunt: si ex senectute est, tenui ferramento id totum extrinsecus adurendum est, deinde melle inungendum: a quarto die vapore aquae calidae fovendum, inungendumque medicamentis ad cicatricem perducentibus.

- 11 Haec fere circa oculum in angulis palpebrisque incidere consuerunt. In ipso autem oculo nonnumquam summa attollitur tunica, sive ruptis intus membranis aliquibus sive laxatis, et similis figura acino fit: unde id staphyloma Graeci vocant.—Curatio duplex est: altera: ad ipsas radices per medium transuere acu duo lina ducente; deinde alterius lini duo capita ex superiore parte, alterius ex inferiore astringere inter se; quae paulatim secando id excidunt. Altera: in summa parte eius ad lenticulae magnitudinem excidere; deinde sordium aut cadmiam infriare. Utrolibet autem facto, album ovi lana excipiendum et inponendum; posteaque vapore aquae calidae fovendus oculus et lenibus medicamentis inungendus est.
- 12 Clavi autem vocantur callosa in albo oculi tubercula, quibus nomen a figurae similitudine est. Hos ad imam radicem perforare acu commodissimum est, infraque eam excidere; deinde lenibus medicamentis inungere.
- 13 Suffusionis iam alias (VI. 6. 35) feci mentionem,

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<sup>a</sup> The term staphyloma (from the Greek *σταφυλή*, a bunch of grapes) is still used for the condition which arises when a puncture through the outer sclerotic coat lets the blue iris protrude through, and gives rise to a grape-like swelling.



*Staphyloma removed by ligation.*

- A. Needle transfixes pedicle carrying two ligatures.
- B. Two ligatures transfixing pedicle.
- C. Ligatures separated to enclose each half of the pedicle.
- D. Each ligature when tied grips half of the pedicle.

[To face p. 344.]



If this is due to bad treatment, the same procedure as that noted above is employed, but the horns of the incision are to be directed now towards the jaws, not towards the eyeball: if from old age, all that extrudes is burnt away with a fine cautery, then honey smeared on; from the fourth day the eye is steamed, and anointed with medicaments to induce a scar.

Such as a rule are the lesions which are apt to occur around the eyeball in the angles or eyelids. But in the eyeball itself the outer tunic is sometimes raised, by the rupture or by the relaxation of certain membranes inside, and its shape becomes like a grape: the Greeks therefore call the lesion staphyloma.<sup>a</sup> There are two modes of treatment. In one a needle carrying two threads is passed through the middle of its base, and first the two ends of the upper thread, and then those of the lower, are knotted, and these gradually cut through and so excise the staphyloma.<sup>b</sup> In the other method, a piece about the size of a lentil is cut off from its tip, then oxide or carbonate of zinc is dusted on. After either method, wool soaked in white of egg is applied; subsequently the eye is steamed, and then anointed with soothing medicaments.

Again, small hard tumours in the white of the eyeball are called clavi, from a resemblance in shape to nailheads. These it is best to transfix with a needle at their base, and to cut away underneath the needle; then to anoint with soothing medicaments.

I have already made mention elsewhere<sup>c</sup> of

<sup>b</sup> See diagram, p. 344.

<sup>c</sup> VI. 6. 35 and note.

## CELSUS

quia cum recens incidit, medicamentis quoque saepe discutitur: sed ubi vetustior facta est, manus curationem desiderat, quae inter subtilissimas haberi potest. De qua antequam dico, paucis ante ipsius oculi natura indicanda est. Cuius cognitio cum ad plura loca pertineat, tum vel praecipue ad hunc pertinet. Is igitur summas habet duas tunicas, ex quibus superior a Graecis ceratoides vocatur. Ea, qua parte alba est, satis crassa; pupillae loco  
 B extenuatur. Huic inferior adiuncta est, media parte, qua pupilla est, modico foramine concava; circa tenuis, ulterioribus partibus ipsa quoque plenior, quae chorioides a Graecis nominatur. Hae duae tunicae, cum interiora oculi cingant, rursus sub his coeunt, extenuataeque et in unum coactae per foramen, quod inter ossa est, ad membranam cerebri perveniunt eique inhaerescunt. Sub his autem, qua parte pupilla est, locus vacuus est; deinde infra rursus tenuissima tunica, quam Herophilus  
 C arachnoidem nominavit. Ea media subsidit . . .<sup>1</sup> eoque cavo continet quiddam, quod a vitri similitudine hyaloides Graeci vocant. Id neque liquidum neque aridum est, sed quasi concretusumor, ex cuius colore pupillae color vel niger est vel caesius, cum summa tunica tota alba sit: id autem superve-

<sup>1</sup> *This text is kept by Daremberg, but Marx thinks there is a considerable lacuna after subsidit and suggests reliquis partibus oculi cavum aequae comprehendit.*

<sup>a</sup> When he speaks of the ceratoides (tunic) Celsus includes both the cornea (the horn-like coat of the eye, *κερατοειδής χιτών*) and the sclerotic coat (*σκληροειδής χιτών*) which is hard in character. Later these were distinguished.

<sup>b</sup> *χοριοειδής ύμήν* (the chorioid membrane), which like the foetal chorion, contains very numerous blood vessels.

cataract, because when of recent origin it is also often dispersed by medicaments: when it is more chronic it requires treatment by surgery, and this is one of the most delicate operations. Before I speak of this, the nature of the eyeball itself has to be briefly explained. A knowledge of this is often useful, but especially here. The eyeball, then, has two external tunics, of which the outer is called by the Greeks *ceratoides*.<sup>a</sup> In that part of the eye which is white it is fairly thick; over the region of the pupil it is thin. To this tunic the under one is joined; in the middle where the pupil is, it is pierced by a small hole: around this it is thin, further out it too is thicker and is called by the Greeks *chorioides*.<sup>b</sup> These two tunics whilst enclosing the contents of the eyeball, coalesce again behind it, and after becoming thinned out and fused into one, go through the space between the bones, and adhere to the membrane of the brain. Under these two tunics, at the spot where the pupil is, there is an empty space; then underneath again is the thinnest tunic, which Herophilus named *arachnoides*.<sup>c</sup> At its middle the *arachnoides* is cupped, and contained in that hollow is what, from its resemblance to glass, the Greeks call *hyaloides*;<sup>d</sup> it is humour, neither fluid nor thick, but as it were curdled, and upon its colour is dependent the colour of the pupil, whether black or steel-blue, since the outer tunic is quite white: but this humour is enclosed by that thin

<sup>a</sup> ἀραχνοειδῆς ὑμήν, the arachnoid (cobweb-like) membrane; also called ἀμφιβληστροειδῆς (net-like), Latin *retina*, the name by which it is still known.

<sup>d</sup> ὑαλοειδὲς (glass-like) ὑγρόν, the vitreous humour (*vitrum*, glass).

## CELSUS

niens ab interiore parte membranula . . .<sup>1</sup> includit. Super his gutta umoris est, ovi albo similis, a qua videndi facultas proficiscitur: crystalloides a Graecis nominatur.

- 14 Igitur vel ex morbo vel ex ictu concrescitumor sub duabus tunicis, qua locum esse vacuum proposui (13 B); isque paulatim indurescens interiori . . .<sup>2</sup> potentiae se opponit. Vitiique eius plures species sunt; quaedam sanabiles, quaedam quae curationem non admittunt. Nam si exigua suffusio est, si immobilis, colorem vero habet marinae aquae vel ferri nitentis et a latere sensum aliquem fulgoris relinquit, spes superest. Si magna est, si nigra pars oculi, amissa naturali figura, in aliam vertit, si suffusioni color caeruleus est aut auri similis, si labat et hac B atque illac movetur, vix umquam succurritur. Fere vero peior est, quom ex graviore morbo, maioribus capitis doloribus vel ictu vehementiore orta est. Neque idonea curationi senilis aetas est, quae sine eo vitio tamen aciem hebetem habet: at ne puerilis quidem, sed inter haec media. Oculus quoque curationi neque exiguus neque concavus satis oportunus est. Atque ipsius suffusionis quaedam maturitas est: expectandum igitur est, donec iam non fluere sed duritie quadam concrevisse videatur.

<sup>1</sup> Marx supplies 'illa' after membranula.

<sup>2</sup> Marx adds oculi after interiori.

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<sup>a</sup> κρυσταλλοειδές (ice-like) ὑγρόν. The seat of vision was placed in the crystalline lens. Biconvex lenses were not understood or made before the time of Kepler, and Celsus does not use the word *lens*. See diagram, p. 350.

<sup>b</sup> Locus vacuus: the posterior chamber between the pupil and iris in front, and the lens behind, the ancients held to be like the anterior chamber, and to contain similar fluid

membrane which comes over it from the interior. In front of these is a drop of humour like white of egg, from which comes the faculty of seeing; it is named by the Greeks *crystalloides*.<sup>a</sup>

Now either from disease or from a blow, a humour forms underneath the two tunics in what I have stated to be an empty space;<sup>b</sup> and this as it gradually hardens is an obstacle to the visual power within. And there are several species of this lesion; some curable, some which do not admit of treatment. For there is hope if the cataract is small, and immobile, if it has also the colour of sea water or of glistening steel, and if at the side there persists some sensation to a flash of light. If large, if the black part of the eye has lost its natural configuration and is changed to another form, if the colour of the suffusion is sky blue or golden, if it shakes and moves this way and that, then it is scarcely ever to be remedied. Generally too the case is worse when the cataract has arisen from a severe disease, from severe pains<sup>c</sup> in the head or from a blow of a violent kind. Old age is not favourable for treatment, since apart from this lesion, sharpness of vision is naturally dulled; neither is childhood favourable, but rather intermediate ages. Neither a small nor a sunken eye is satisfactory for treatment. And in the cataract itself, there is a certain development. Therefore we must wait until it is no longer fluid, but appears to have coalesced to some sort of hardness. Before which underwent hardening. It was only when dead bodies were examined that the seat of cataract was found to be in the lens, and the so-called empty space only a potential one.

<sup>c</sup> The cases of severe pains in the head or of violent injuries were not cases of cataract at all.

## CELSUS

Ante curationem autem modico uti cibo, bibere aquam triduo debet, pridie ab omnibus abstinere.

C Post haec in adverso collocandus est, loco lucido, lumine adverso, sic ut contra medicus paulo altius; a posteriore parte caput eius, qui curabitur, minister contineat, ut immobile id praestet: nam levi motu eripi acies in perpetuum potest. Quin etiam ipse oculus, qui curabitur, immobilior faciendus est, super alterum lana inposita [deligata]: curari vero sinister

D oculus dextra manu, dexter sinistra debet. Tum acus admovenda est, sic acuta, ut foret, non nimium tenuis; eaque demittenda sed recta est per summas duas tunicas medio loco inter oculi nigrum et angulum temporis propiorem, e regione mediae suffusionis sic, ne qua vena laedatur. Neque tamen timide demittenda est, quia inani loco excipitur; ad quem cum ventum est, ne mediocriter quidem peritus falli

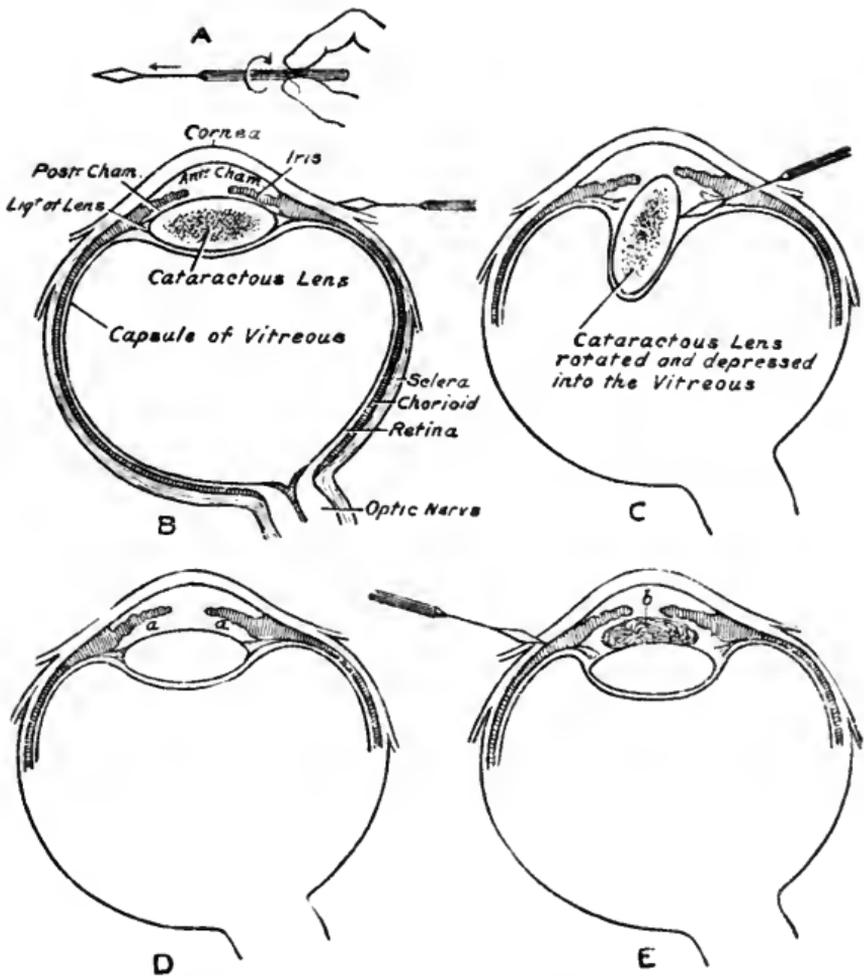
E potest, quia prementi nihil renititur. Ubi eo ventum est, inclinanda acus ad ipsam suffusionem leviterque ibi verti et paulatim eam deducere infra regionem pupillae debet; ubi deinde eam transit, vehementius imprimi, ut inferiori parti insidat. Si haesit, curatio expleta est: si subinde redit, eadem acu concidenda et in plures partes dissipanda est, quae singulae

F et facilius conduntur et minus late efficiunt. Postea

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<sup>a</sup> See diagram.

<sup>b</sup> *deducere . . . insidat*, in this paragraph Celsus describes the operation for "couching" (med. English) or "pricking" a cataract. The word "pricking" is a translation of the Greek word *παρακέντησις*, and the operation (performed by an implement *παρακεντητήριον*) continued in use from antiquity until in recent times it was replaced by extraction. The old operation is still practised in the East by native oculists because septic infection is so rare after it. The breaking up of the cataract by the needle continues to be the regular treatment for soft forms of cataract where absorption of fragments may be anticipated.



### *Cataract Couched.*

- A. Paracentesis Needle, pointed, spear-ended, fixed in a cylindrical handle, which was pressed onwards whilst rotated by the thumb and finger.
- B. Eyeball. Lens cataractous. Needle entered midway between the outer angle of the eyelid and the outer margin of the iris—until the point of the needle appeared in the pupil over the front of the Cataract.
- C. Cataractous lens in the course of being "Couched."
- D. Diagram of the supposed "Locus Vacuus," the posterior chamber *a a* filled with aqueous humour like the anterior chamber.
- E. Infusion, Suffusion of opaque, diseased humour into the "Locus Vacuus"; *b*, supposed to be the Cataract which was depressed or broken up



treatment the patient should eat in moderation, and for three days beforehand drink water, for the day before abstain from everything. Then he is to be seated opposite the surgeon in a light room, facing the light, while the surgeon sits on a slightly higher seat; the assistant from behind holds the head so that the patient does not move: for vision can be destroyed permanently by a slight movement. In order also that the eye to be treated may be held more still, wool is put over the opposite eye and bandaged on: further the left eye should be operated upon with the right hand, and the right eye with the left hand. Thereupon a needle is to be taken pointed enough to penetrate, yet not too fine; and this is to be inserted straight through the two outer tunics at a spot intermediate between the pupil of the eye and the angle adjacent to the temple, away from the middle of the cataract, in such a way that no vein is wounded.<sup>a</sup> The needle should not be, however, entered timidly, for it passes into the empty space; and when this is reached even a man of moderate experience cannot be mistaken, for there is then no resistance to pressure. When the spot is reached, the needle is to be sloped against the suffusion itself and should gently rotate there and little by little guide it below the region of the pupil; when the cataract has passed below the pupil it is pressed upon more firmly in order that it may settle below.<sup>b</sup> If it sticks there the cure is accomplished; if it returns to some extent, it is to be cut up with the same needle and separated into several pieces, which can be the more easily stowed away singly, and form smaller obstacles to vision. After this the

## CELSUS

educenda recta acus est; inponendumque lana molli exceptum ovi album, et supra, quod inflammationem coerceat; atque ita devinciendum. Post haec opus est quiete, abstinentia, lenium medicamentorum inunctionibus; cibo, qui postero die satis mature datur, primum liquido, ne maxillae laborent; deinde inflammatione finita, tali, qualis in vulneribus (V. 26. 30) propositus est; quibus, ut aqua diutius bibatur, necessario accedit.

- 15 De pituitae quoque tenuis cursu, qui oculos infestat, quatenus medicamentis agendum est, iam explicui (VI. 6. 16). Nunc ad ea veniam, quae curationem manu postulant. Animadvertimus autem quibusdam numquam siccescere oculos, sed semper umore tenui madere; quae res aspritudinem continuat, ex levibus momentis inflammationes et lippitudines excitat, totam denique vitam hominis infestat; idque in quibusdam nulla ope adiuvari  
B potest, in quibusdam sanabile est: quod primum [discrimen est] nosse oportet, ut alteris succurratur, alteris manus non iniciatur. Ac primum supervacua curatio est in iis, qui ab infantibus id vitium habent, quia necessario mansurum est usque mortis diem; deinde non necessaria etiam in iis, quibus non multa, sed acris pituita est, siquidem manu nihil adjuvantur: medicamentis et victus ratione, quae crassiorem pituitam reddit, ad sanitatem perveniunt. Lata  
C etiam capita vix medicinae patent. Tum interest

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<sup>a</sup> V. 26. 30 B.

<sup>b</sup> V. 6. 16.

<sup>c</sup> VI. 6. 17, etc.

<sup>d</sup> Broad heads in contrast with Long heads had already been noted by Hippocrates I. 110 (*Airs*, XIV. *et seqq.*); but the point of Celsus' statement is not clear.

needle is drawn straight out; and soft wool soaked in white of egg is to be put on, and above this something to check inflammation; and then bandages. Subsequently the patient must have rest, abstinence, and inunction with soothing medicaments; the day following will be soon enough for food, which at first should be liquid to avoid the use of the jaws; then, when the inflammation is over, such as has been prescribed for wounds,<sup>a</sup> and in addition to these directions it is necessary that water should for some time be the only drink.

Also with regard to the discharge of a thin rheum which troubles the eyes, I have already explained<sup>b</sup> what is to be done by means of medicaments. I come now to cases which demand surgical treatment. But we have remarked that in some the eyes never dry up, but are always moistened by a thin rheum; this keeps up trachoma, and upon slight provocation excites inflammations and ophthalmia, so troubling the patient all his life; and sometimes this cannot be remedied at all, but sometimes it is curable. This is the first thing to be decided, that in the latter case the patient may be relieved, in the former no surgical treatment may be applied. And in the first place, the treatment is useless in those who have had the disorder from infancy, for of necessity it will continue to their dying day; again, it is also not necessary in those cases where the discharge is scanty, though acrid, since they will derive no benefit from surgery; by medicaments and by the regulation of diet which renders the rheum thicker, they come back to health.<sup>c</sup> Further, broad heads<sup>d</sup> are hardly ever adapted to the treatment. Then it makes a difference whether

## CELSUS

venae pituitam mittant quae inter calvariam et cutem sunt, an quae inter membranam cerebri et calvariam. Superiores fere per tempora oculos rigant; inferiores per eas membranas, quae ob oculis ad cerebrum tendunt. Potest autem adhiberi remedium iis, quae supra os fluunt; non potest iis, quae sub osse. Ac ne iis quidem succurritur, quibus pituita utrimque descendit, quia levata altera parte nihilo minus altera infestat. Quid sit autem, hac D ratione cognoscitur. Raso capite ante ea medicamenta, quibus in lippitudine pituita suspenditur, a superciliis usque ad verticem inlini debent. Si sicci oculi esse coeperunt, apparet per eas venas, quae sub cute sunt, inrigari: si nihilo minus madent, manifestum est sub osse descendere: si est umor, sed levior, duplex vitium est. Plurimi tamen ex laborantibus reperiuntur, quos superiores venae exercent; ideoque pluribus etiam opitulari licet. Idque non in Graecia tantummodo, sed in aliis quoque gentibus celebre est, adeo ut nulla medicinae E pars magis per nationes quoque exposita sit. Reperti in Graecia sunt, qui novem lineis cutem capitis inciderent; duabus in occipitio rectis, una super eas

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<sup>a</sup> This operation, which was performed by experts, was common all over the ancient world. Hippocrates (Littre IV. 185) mentioned its use among the Libyans and the practice has prevailed up to recent times in North Africa and the Soudan. It was based on the idea that the discharge originated within the head beneath the skull and that the "peccant humour" (pituita), was carried down to the eyes by the superficial veins, or by veins from within the skull to the back of the eyes. The operation withdrew it by way of the wounds but avoided loss of blood (see below). Celsus omits the more severe operation *Hypospathismus*, described

the rheum comes from blood vessels between the skull and the scalp, or from those between the membrane of the brain and the skull. Generally those above the skull irrigate the eyes by way of the temples, those under it by way of membranes connecting the eyes with the brain. Now it is possible to apply a remedy to those blood vessels which lie above the bone—to those below it is not. Neither can patients be relieved in whom rheum is flowing down both ways, because although relieved in one direction, none the less trouble continues by the other. How the matter stands is to be learnt as follows.<sup>a</sup> The head having been first shaved, those medicaments by which the rheum is checked in ophthalmia are smeared on from the eyebrow to the crown of the head.<sup>b</sup> If the eyes begin to dry, it is clear that the moisture comes from those blood vessels which are beneath the scalp; if in spite of the application, they continue moist, it is manifest that the downflow of rheum is from under the skull. If there is humour but in less amount, the lesion is double. In the majority of patients, however, it is found that the superficial blood vessels are involved, and so also the majority can be relieved. This is well known, not in Greece only, but among other races too, so that no portion of the Art of Medicine has become more widespread among the nations of the earth. Some Greek practitioners made nine linear incisions into the scalp, two vertical ones in the occipital region, a transverse one above

by Galen (XIV. 781, 784) and Paulus Aegineta (VI. 6) in which a double-edged raspatory (*ὑποσπαθιστήρ*), was forced under the scalp from one incision through to another.

<sup>b</sup> VI. 6. 1 H, to 9 C.

## CELSUS

transversa; deinde duabus super aures, una inter eas item transversa; tribus inter verticem et frontem rectis. Reperti sunt, qui a capite recte eas lineas ad tempora deducerent, cognitisque ex motu maxillarum musculorum initiis leviter super eos cutem inciderent, diductisque per retusos hamos oris insererent linamenta, ut neque inter se cutis antiqui fines committerentur, et in medio caro incresceret; quae venas, ex quibus umor ad oculos transiret, F adstringeret. Quidam etiam atramento duas lineas duxerunt a media aure ad mediam alteram aurem; deinde a naribus ad verticem. Tum ubi lineae committebantur, scalpello inciderunt, et post sanguinem effusum os ibidem adusserunt. Nihilominus autem et in temporibus et inter frontem atque calvariam eminentibus venis idem candens ferrum G admoverunt. Frequens curatio est venas in temporibus adurere, quae fere quidem in eiusmodi malotument: sed tamen, ut inflentur magisque se ostendant, cervix ante modice deliganda est, tenuibusque ferramentis et retussis venae adurendae, donec in oculis pituitae cursus conquiescat. Id enim signum est quasi excaecatorum itinerum, per quae umor H ferebatur. Valentior tamen medicina est, ubi tenues conditaeque venae sunt, ideoque legi non possunt, eodem modo cervice deligata retentoque ab ipso spiritu quo magis venae prodeant, atramento

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\* *e.g.* in Gaul, see below, § I.

them; then two above the ears, with a cross-cut uniting them, three vertical ones between the crown and the forehead. Others were found who drew those lines directly from the vertex to the temples and having ascertained where the muscles began from the movements of the jaws, cut through the scalp over them with a light hand, and after the margins of the incisions had been retracted by blunt hooks, inserted lint, in order that the former edges of the skin should not unite, and that flesh should grow up in between so as to constrict the veins carrying humour to the eyes. Some even marked out with ink two lines, from the middle of one ear to the middle of the other, and from the nose to the crown. Then, where the two lines meet, they cut with a scalpel, and after blood has flowed out, they cauterized the bone there. But further, both on the temples and also between the forehead and crown, they likewise applied the red hot cautery to prominent blood vessels. A treatment frequently used <sup>a</sup> is to cauterize the blood vessels on the temples, which indeed in this malady are usually rather swollen, but in order that they may be more distended and show up better, the neck is first bandaged moderately tight and the blood vessels then burnt with fine blunt cautery points until the flow of rheum to the eyes ceases. For that is a sign of the blocking up as it were of the channels by which humor was being carried. There is a more effectual means, however, when the blood vessels are thin and deep-seated, and so cannot be picked out, whereby the neck is bandaged as before, and the patient holds his breath, so as to make the vessels more prominent, and then those on the temples and between the fore-

## CELSUS

notare eas contra tempora et inter verticem ac frontem; deinde cervice resoluta, qua notae sunt venae, incidere, et sanguinem mittere; ubi satis I fluxit, tenuibus ferramentis adurere: contra tempora quidem timide, ne subiecti muscoli qui maxillas tenent sentiant; inter frontem vero et verticem vehementer, ut squama ab osse secedat. Efficacior tamen etiamnum est Afrorum curatio, qui verticem usque ad os adurant sic, ut squamam remittat. Sed nihil melius est quam quod in Gallia est comata: qui ibi venas in temporibus et in K superiore capitis parte legunt. Adusta quomodo curanda sint, iam explicui (V. 27. 13). Nunc illud adicio: neque ut crustae decidant, neque ut ulcus inpleatur, adustis venis esse properandum, ne vel sanguis erumpat vel cito pus subprimatur, cum per hoc siccescere eas partes opus sit, per illud exhauriri opus non sit: si quando tamen sanguis eruperit, infricanda medicamenta esse, quae sic sanguinem supprimant, ne adurant. Quemadmodum autem venae delegendae sunt, quidque lectis is faciendum sit, cum venero ad crurum varices, dicam (31).

8. Verum ut oculi multiplicem curationem etiam manus exigunt, sic in auribus admodum pauca sunt, quae in hac medicinae parte tractentur. Solet tamen evenire, vel a primo die protinus vel postea facta exulceratione, dein per cicatricem aure repleta, ut foramen in ea nullum sit, ideoque audiendi usu

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<sup>a</sup> V. 27. 13.

<sup>b</sup> VII. 31.

head and vertex are marked out with ink; upon this the neck is released, the blood vessels are cut into where marked and blood let flow; when enough has been let out, the vessels are burnt with fine cauteries; over the temples this is done cautiously lest the underlying muscles controlling the jaws feel it; between the forehead and the crown the cautery is applied firmly in order that a scale may become detached from the skull. Even more efficacious is the African method; they burn the crown of the scalp through down to the bone so that it may cast off a scale. But there is nothing better than the practice in transalpine Gaul; there they pick out blood vessels in the temples and crown of the head. Now I have already explained the treatment after cautery.<sup>a</sup> I here add that there should be no haste, either in detaching crust, or in letting the ulceration heal after cauterization of blood vessels, lest haemorrhage burst out, or pus be too quickly suppressed, for whilst it is the object by the ulceration to dry up these parts, it is not the object to drain them out by bleeding; but if there is bleeding, such medicaments should be sprinkled on as suppress bleeding, but do not cauterize. With regard to the selection of blood vessels, and what is to be done when they are picked out, I will speak when I come to varicose veins in the leg.<sup>b</sup>

8. Whilst the eyes demand many kinds of surgical treatment, there are but few affections of the ears which are dealt with by this branch of medicine. It does happen, however, whether from birth, or later when there has been ulceration and the ear becomes filled up by scarring, that there is no passage in the ear and so it cannot hear. When this

## CELSUS

careat. Quod ubi incidit, specillo temptandum est, altene id repletum, an in summo tantum glutinatum sit. Nam si alte est, prementi non cedit; si in 2 summo, specillum protinus recipit. Illud attingi non oportet, ne sine effectus spe distentio oriatur nervorum, et ex ea mortis periculum sit: hoc facile curatur. Nam qua cavom esse debet, vel medicamentum aliquod inponendum est ex adurentibus, vel candenti ferro aperiendum, vel etiam scalpello incidendum. Cumque id patefactum et iam ulcus purum est, coicienda eo pinna est, inlita medicamento cicatricem inducente, circaque idem medicamentum dandum, ut cutis circa pinnam sanescat; quo fit, ut ea remota postea facultas audiendi sit. 3 At ubi aures, in viro puta, perforatae sunt et offendunt, traicere id cavum celeriter candente acu satis est, ut leviter eius orae ulcerentur; aut etiam adurente medicamento idem exulcerare, postea deinde inponere id, quod purget, tum quod eo loco repleat et 4 cicatricem inducat. Quod si magnum id foramen est, sicut solet esse in iis, qui maiora pondera auribus gesserunt, incidere quod superest ad extremum oportet; supra deinde oras scalpello exulcerare, et postea suere, ac medicamentum, quo glutinetur, inponere. Tertium est, si quid ibi curti est, sarcire. Quae res cum in labris quoque et naribus fieri possit, eandem etiam rationem habeat, simul explicanda est.

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<sup>a</sup> Piercing the lobe of the ear for the wearing of ear-rings was a common practice from very early times (*Exodus* xxi. 6). An enlarged lobe, due to wearing heavy ear-rings, can still be often seen among native women in India or Africa.

<sup>b</sup> VII. 9. 1-3.

is the case, we must try with a probe whether the part is filled up deeply, or whether there is merely a superficial agglutination. For if deeply, there is no yielding to pressure made on the probe; if superficial, the probe enters freely. The former should not be touched, lest, where there is no hope of success, a spasm may be set up, and from that may follow danger of death. The latter is easily treated. For where the passage should be, either one of the caustic medicaments is to be applied, or an opening made with the cautery, or the place may even be cut through with a scalpel. After it has been laid open, and the ulceration has been cleaned, a quill is to be inserted, smeared with a medicament to induce a scar, and the same medicament applied around, until the skin has healed round the quill; by this means when the quill has been removed, the faculty of hearing follows. But where the ears,<sup>a</sup> in a man for instance, have been pierced and have become offensive, it is enough to pass a red hot needle quickly through the hole in order to blister its margins superficially or even to produce the same effect by a caustic; then afterwards to put on applications to clean the place and later what will make the flesh grow there and induce a scar. But if the hole is enlarged, as is usually the case with those who have worn heavy ear-rings, the rest of the lobule should be cut through; then the edges above made raw with a scalpel, and the wound sutured, and agglutinating medicaments put on. A third method, where there has been some mutilation, is to patch, and since this can be done in the case of the lips and nostrils as well, and the procedure is the same, the description too should be given at the same time.<sup>b</sup>

## CELSUS

9. Curta igitur in his tribus . . .<sup>1</sup> ac si qua parva sunt, curari possunt; si qua maiora sunt, aut non recipiunt curationem, aut ita per hanc ipsam deformantur, ut minus indecora ante fuerint. Atque in aure quidem et naribus deformitas sola timeri potest: in labris vero, si nimium contracta sunt, usui quoque necessario iactura fit, quia minus facile et cibus adsumitur et sermo explicatur. Neque enim creatur ibi corpus, sed ex vicino adducitur; quod in levi mutatione et nihil † eripere<sup>2</sup> et fallere<sup>2</sup> oculum potest, in magna non potest. Neque senile autem corpus, neque quod mali habitus est, neque in quo difficulter ulcera sanescunt, huic medicinae idoneum est, quia nusquam celerius cancer occupat aut difficiliter tollitur. Ratio curationis eiusmodi est: id, quod curtum est, in quadratum derigere; ab interioribus eius angulis lineas transversas incidere, quae citiorem partem ab ulteriore ex toto deducant; deinde ea, quae sic resolvimus, in<sup>3</sup> unum adducere. Si non satis iunguntur, ultra lineas, quas ante fecimus, alias duas lunatas et ad plagas conversas immittere, quibus summa tantum cutis diducatur: sic enim fit, ut facilius quod adducitur sequi possit; quod non est cogendum, sed ita adducendum, ut ex facili subsequatur et dimissum non multum recedat. Interdum tamen ab altera parte cutis . . .<sup>3</sup> aut omnino adducta deformem,

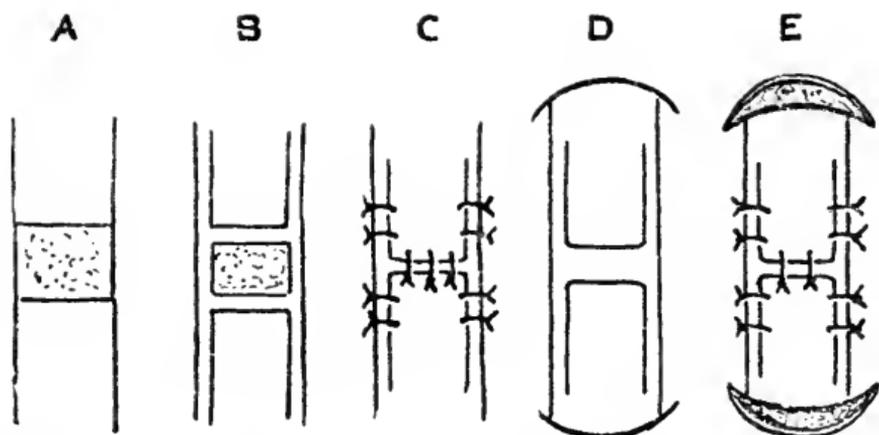
<sup>1</sup> *Marx inserts* fiunt corporis partibus *after* tribus, and *this is translated.*

<sup>2</sup> *Marx supplies* paene *after* eripere.

<sup>3</sup> *Marx inserts* aut maximam partem *after* cutis and *this is translated.*

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\* See diagram.



*Operation for cure of a Mutilation.*

- A. Quadrilateral incisions for the excision of the mutilation. Parallel incisions carried from the four angles in opposite directions.
- B. Skin and underlying tissue raised as flaps on opposite sides of the excised area.
- C. Flaps drawn together and sutured to cover over the area.
- D. Semilunar incisions to relieve tension.
- E. Relaxed flaps drawn together, leaving two lunate raw areas to heal by ulceration.

*[To face p. 362.*

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9. Mutilations then occur in these three parts and can be treated if they are small; if they are large, either they are not susceptible of treatment, or else may be so deformed by it as to be more unsightly than before. And indeed in the ear and nostrils the deformity is the only trouble; but in the case of the lips, if these have become too much contracted, there is also loss of a necessary function, because it becomes less easy both to take food and to speak plainly. Now new substance is not produced at the place itself, but it is drawn from the neighbourhood; and when the change is small this hardly robs any other part and may pass unnoticed, but when large, it cannot do so. And again, this procedure is unsuited to the aged, to those in bad bodily condition, and to those whose wounds heal with difficulty; because there are no cases in which canker sets in more quickly, or is more difficult to get rid of. The method of treatment is as follows: the mutilation is enclosed in a square; from the inner angles of this incisions are made across, so that the part on one side of the quadrilateral is completely separated from that on the opposite side. Then the two flaps, which we have freed, are brought together.<sup>a</sup> If they cannot be sufficiently brought together, at each end beyond the original incisions semilunar cuts which only divide the skin are made with the horns pointing towards the incisions. This enables the edges to be brought together more easily. No force should be used, but the traction should be such that the edges easily approximate and, when left free, do not recoil much. At times, however, if the skin has been drawn across from one side to a considerable extent, or even at all, it

## CELSUS

quem reliquit, locum reddit. Eiusmodi loci altera  
4 pars incidenda, altera intacta habenda est. Ergo  
neque ex imis auribus neque ex medio naso imisve  
narum partibus neque ex angulis labrorum quicquam  
adtrahere temptabimus: utrimque autem petemus,  
si quid summis auribus, si quid imis, si quid aut medio  
naso aut mediis naribus aut mediis labris deerit.  
Quae tamen interdum etiam duobus locis curta  
esse consuerunt: sed eadem ratio curandi est. Si  
cartilago in eo, quod incisum est, eminent, excidenda  
est: neque enim aut glutinatur aut acu tuto traicitur.  
Neque longe tamen excidi debet, ne inter duas oras  
5 liberae cutis utrimque coitus puris fieri possit. Tum  
iunctae orae inter se suendae sunt utrimque cute  
adprehensa, et qua priores lineae sunt, ea quoque  
suturae iniciendae sunt. Siccis locis ut in naribus  
inlita spuma argenti satis proficit. In posteriores vero  
lunatasque plagas linamentum dandum est, ut caro  
increscens vulnus impleat; summaque cura quod ita  
sutum est, tuendum esse apparere ex eo potest,  
quod de cancro supra (2) posui. Ergo etiam tertio  
quoque die fovendum erit vapore aquae calidae,  
rursusque idem medicamentum iniciendum; fereque  
septimo die glutinatum est. Tum suturae eximi, et  
ulcus ad sanitatem perduci debet.

10. Polypum vero, qui in naribus nascitur, ferro  
praecipue curari iam alias (VI. 8. 2 B) posui. Ergo  
etiam hunc ferramento acuto in modum spathae

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<sup>a</sup> VI. 8. 2.

makes the part which it has left unsightly. In a case of that sort, leaving that side untouched, an incision should be made only on the other side. For instance we should not attempt to make traction upon the lobules of the ears, the bridge of the nose, the margins of the nostrils, or the corners of the lips. But we shall try traction from either side if anything is required for the upper part of the ears, the tip of the nose, the bridge of the nose, the skin between the nostrils, and the middle of the lips. At times the mutilation is in two places, but the method of treatment is the same. Cartilage if it projects into the incision is to be cut away; for it does not agglutinate nor is it safely transfixed by a needle. But it should not be much cut away lest pus collect on each side between the two margins of loose skin. Then the margins after being brought together are to be sutured by taking up from each skin only, and the earlier incisions are also to be sutured. In dry parts such as the nostrils, it is sufficient to spread on litharge. But into the more distant semilunar wounds lint is to be placed in order that flesh may grow and fill the wound; and it is clear that the greatest attention should be paid to what is thus sutured, from what I mentioned above about canker. Consequently every third day the part should be steamed, then dressed as before; and generally the wound has adhered by the seventh day. Then the sutures should be removed, and the wound allowed to heal.

10. As for the polypus which grows in the nostrils, I have already laid down elsewhere <sup>a</sup> that the best treatment is with the knife. Therefore this too should be loosened from the bone by a sharp instru-

## CELSUS

facto resolvere ab osse oportet, adhibita diligentia, ne infra cartilago laedatur, in qua difficilis curatio est. Ubi abscissus est, unco ferramento extrahendus est; tum implicatum linamentum vel aliquid ex penicillo respersendum est medicamento, quo sanguis supprimitur, eoque naris leviter implenda. Sanguine suppresso linamento ulcus purgandum est. Ubi purum est, eo pinna, eodem modo quo in aure supra (8. 2) positum est, medicamento inlita, quo cicatrix inducitur, intus demittenda, donec in totum id sanescat.

11. Id autem vitium, quod ozena Graece vocatur, si medicamentis non cederet, quemadmodum manu curandum esset, apud magnos chirurgos non repperi. Credo quia res raro ad sanitatem satis proficit, cum aliquid in ipsa curatione tormenti habeat. Apud quosdam tamen positum est vel fictilem fistulam vel enodem scriptorium calamum in narem esse coiciendum, donec susum ad os perveniat; tum per id tenue ferramentum candens dandum esse ad ipsum os; deinde adustum locum purgandum esse aerugine et melle: ubi purus est, Lycio ad sanitatem perducendum. Vel narem incidendam esse ab ima parte ad os, ut et conspici locus possit, et facilius candens ferramentum admoveri; tum sui narem debere, et adustum quidem ulcus eadem ratione curari: suturam vero inlini vel spuma argenti vel alio glutinante.

12. 1. In ore quoque quaedam manu curantur. Ubi in primis dentes nonnumquam moventur, modo propter radicum inbecillitatem, modo propter gingivarum arescentium vitium.—Oportet in utrolibet candens ferramentum gingivis admoveri, ut attingat

ment, shaped like a spear head, care being taken not to injure the cartilage under it, which is difficult to treat. When detached it is to be extracted by an iron hook; then the nostril is gently filled with lint folded or in a roll, soaked in something to stop the bleeding; when the bleeding has stopped, the ulceration is to be cleaned with a lint plug. When it is clean, insert a quill (as described above in the case of the ear), smeared with the medicament which causes a scar to form <sup>a</sup> until healing is completed.

11. Now as to the lesion called by the Greeks ozaena,<sup>b</sup> I have found nothing in the writings of great surgeons about surgical treatment if it did not yield to medicaments. I believe this is because it seldom heals quite completely, though the treatment itself involves considerable pain. Some, however, lay down that either an earthenware tube, or a smooth quill, is to be inserted into the nostril until it reaches the bone, and then a fine cautery point is passed down the tube right to the bone. The cauterized spot is afterwards dressed with verdigris and honey, and when clean is healed by applying lycium. Or the nostril may be laid open from its base as far as the bone, so that the place can be seen, and the cautery more easily applied; then the nostril must be sewn up, and the cauterized ulceration treated as above; the fine suture is dressed with litharge or other agglutinant.

12. In the mouth too some conditions are treated by surgery. In the first place, teeth sometimes become loose, either from weakness of the roots, or from disease drying up the gums. In either case the cautery should be applied so as to touch the

For ozaena, cf. III. 11. 3 and vol. II. 242, note *a*.

## CELSUS

leviter, non insidat. Adustae gingivae melle inlinendae et mulso eluendae sunt. Ut pura ulcera esse coeperunt, arida medicamenta infrianda sunt ex iis, quae reprimunt. Si vero dens dolores movet eximique eum, quia medicamenta nihil adjuvant, placuerit, circumradi debet, ut gingivae ab eo **B** resolvantur; tum is concutiendus est. Eaque faciendae, donec bene moveatur: nam dens haerens cum summo periculo evellitur, ac nonnumquam maxilla loco movetur; idque etiam maiore periculo in superioribus dentibus fit, quia potest tempora oculosve concutere. Tum, si fieri potest, manu; si minus, forfice, dens excipiendus est. Ac si exessus est, ante [id foramen] vel linamento vel bene adcommodato plumbo replendus est, ne sub forfice **C** confringatur. Recta vero forfex ducenda est, ne inflexis radicibus os raram, cui dens inhaeret, parte aliqua frangat. Neque ideo nullum eius rei periculum est utique in dentibus brevibus, qui fere longiores radices non habent: saepe enim forfex cum dentem comprehendere non possit aut frustra comprehendat, os gingivae prehendit et frangit. Protinus autem ubi plus sanguinis profluit, scire licet, aliquid ex osse **D** fractum esse. Ergo specillo conquirenda est testa, quae recessit, et volsella protrahenda est. Si non sequitur, incidi gingiva debet, donec labans ossis testa recipiatur. Quod si factum statim non est, indurescit extrinsecus maxilla, ut is hiare non possit.

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\* Paulus Aegineta, VI. 28, copies this description. Such "shaking" is still advisable even when extracting teeth under anaesthesia.

gums lightly without pressure. The gums so cauterized are smeared with honey, and swilled with honey wine. When the ulcerations have begun to clean, dry medicaments, acting as repressants, are dusted on. But if a tooth gives pain and it is decided to extract it because medicaments afford no relief, the tooth should be scraped round in order that the gum may become separated from it; then the tooth is to be shaken.<sup>a</sup> And this is to be done until it is quite moveable: for it is very dangerous to extract a tooth that is tight, and sometimes the jaw is dislocated. With the upper teeth there is even greater danger, for the temples or eyes may be concussed. Then the tooth is to be extracted, by hand, if possible, failing that with forceps. But if the tooth is decayed, the cavity should be neatly filled first, whether with lint or with lead, so that the tooth does not break in pieces under the forceps. The forceps is to be pulled straight upwards, lest if the roots are bent, the thin bone to which the tooth is attached should break at some part. And this procedure is not altogether free from danger, especially in the case of the short teeth, which generally have shorter roots, for often when the forceps cannot grip the tooth, or does not do so properly, it grips and breaks the bone under the gum. But as soon as there is a large flow of blood it is clear that something has been broken off the bone. It is necessary therefore to search with a probe for the scale of bone which has been separated, and to extract it with a small forceps. If this does not succeed the gum must be cut into until the loose scale is found. And if this has not been done at once, the jaw outside the tooth hardens, so that the patient cannot

## CELSUS

Sed inponendum calidum ex farina et fico cataplasma est, donec ibi pus moveatur; tum incidi gingiva debet. Pus quoque multum profluens ossis fracti nota est: itaque etiam tum id extrahi convenit; nonnumquam etiam eo laeso fistula fit, quae eradi debet. Dens autem scaber, qua parte niger, radendus inlinendusque rosae flore contrito, cui gallae quarta pars et altera murræ sit adiecta; continendumque ore crebro vinum meracum; atque in eo casu velandum caput, ambulatione multa, frictione capitis, cibo non acri utendum. At si ex ictu vel alio casu aliquid labant dentes, auro cum iis, qui bene haerent, vincendi sunt; continendaque ore reprimentia, ut vinum, in quo malicorium decoctum, aut in quo galla candens coniecta sit. Si quando etiam in pueris ante alter dens nascitur quam prior excidat, is qui cadere debuit circumpurgandus et evellendus est; is qui natus est in locum prioris cotidie digito adurgendus, donec ad iustam magnitudinem perveniat. Quotiescumque dente exempto radix relicta est, protinus ea quoque ad id facta forfice, quam rizagran Graeci vocant, eximenda est.

2 Tonsillas autem, quae post inflammationes induru-

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<sup>a</sup> *ρίζάγρα* ("root-catcher"). Such an instrument has actually been found among a collection of Roman surgical instruments, and there is one in the Budapest Museum. Paulus Aegineta VI. 28 (where he is epitomizing Celsus) refers to it.

<sup>b</sup> The Greek name *ἀντιάδες* (Paulus Aegineta, VI. 30) was derived from the position of the tonsils opposite each other. The Latin *tonsillae* was derived from the same idea that the position of the tonsils was like that of a pair of oars (*tonsae*). The more usual Greek name was *παρίσθμα*—Hippocrates,

open his mouth. But a hot poultice made of flour and a fig is then to be put on until pus is formed there: then the gum should be cut into. A free flow of pus also indicates a fragment of bone; so then too it is proper to extract the fragment; sometimes also when the bone is injured a fistula is formed which has to be scraped out. But a rough tooth is to be scraped in the part which has become black, and smeared with crushed rose-petals to which a fourth part of ox-galls and the same amount of myrrh has been added; and at frequent intervals undiluted wine is to be held in the mouth; and in this case the head is to be wrapped up, and the patient should have much walking exercise, massage of his head and food which is not too bitter. But if teeth become loosened by a blow, or any other accident, they are to be tied by gold wire to firmly fixed teeth, and repressants must be held in the mouth, such as wine in which some pomegranate rind has been cooked, or into which burning oak galls have been thrown. In children too if a second tooth is growing up before the first one has fallen out, the tooth which ought to come out must be freed all round and extracted; the tooth which has grown up in the place of the former one is to be pressed upwards with a finger every day until it has reached its proper height. And whenever, after extraction, a root has been left behind, this too must be at once removed by the forceps made for the purpose which the Greeks call *rhizagra*.<sup>a</sup>

Now tonsils<sup>b</sup> which have become hardened after

IV. 130 (*Aph.* III. 26); Littré, VIII. 560 (*Glands*); Galen, VI. 674.

## CELSUS

erunt, antiades autem a Graecis appellantur, cum sub levi tunica sint, oportet digito circumradere et evellere: si ne sic quidem resolvuntur, hamulo excipere et scalpello excidere; tum ulcus aceto eluere et inlinere vulnus medicamento, quo sanguis supprimitur.

3 Uva si cum inflammatione descendit, dolorique est et subrubicundi coloris, praecidi sine periculo non potest: solet enim multum sanguinem effundere: itaque melius est is uti, quae alias (VI. 14) proposita sunt. Si vero inflammatio quidem nulla est, nihilo minus autem ultra iustum modum a pituita deducta sit, et est tenuis, acuta, alba, praecidi debet; itemque si ima livida et crassa, summa tenuis est. Neque quicquam commodius est quam volsellaprehendere, B sub eaque quod volumus excidere. Neque enim ullum periculum est, ne plus minusve praecidatur, cum liceat tantum infra volsellam relinquere, quantum inutile esse manifestum est; idque praecidere, quo longior uva est quam esse naturaliter debet. Post curationem eadem faciendae sunt, quae in tonsilla his proxime (2) posui.

4 Lingua vero quibusdam cum subiecta parte a primo [natali] die vineta est, qui ob id ne loqui quidem possunt.—Horum extrema lingua volsellaprehendenda est, sub eaque membrana incidenda, magna cura habita, ne venae quae iuxta sunt violentur et profusio[ne] sanguinis noceat. Reliqua curatio vulneris in prioribus (2) posita est. Et plerique quidem ubi consanuerunt, locuntur: ego

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<sup>a</sup> Hippocrates, II. 46 (*Prognostica*, XXIII.).

<sup>b</sup> VI. 14.

<sup>c</sup> Section 2 C, *supra*.

inflammation (they are called by the Greeks antiades) since they are enclosed in a thin tunic, should be scratched round with a finger and drawn out. But if they cannot be so detached they should be seized with a hook and excised with a scalpel; and the hollow then swilled out with vinegar and the wound smeared with something to check the blood.

If the uvula,<sup>a</sup> owing to inflammation is elongated downwards, and is painful and dusky red in colour, it cannot be cut away without danger; for usually much blood flows: and so it is better to employ the treatment described elsewhere.<sup>b</sup> But if, though there is no inflammation, it has become drawn too far downwards owing to phlegm, and is thin, pointed and white, it should be cut away; so also when the tip is bluish black and thick, but the base thin. There is no better way than to seize it with a small forceps and below this to cut off as much as we wish. And there is no danger of cutting off too much or too little since we can leave below the forceps only that part which is clearly useless; and cut away what is in excess of the natural length of the uvula. After the operation the same treatment should be carried out as I have just described for the tonsils.<sup>c</sup>

Again the tongue in some persons is tied down from birth to the part underlying it, and on this account they cannot even speak. In such cases the extremity of the tongue is to be seized with a forceps, and the membrane under it incised, great care being taken lest the blood vessels close by are injured and bleeding causes harm. The treatment of the wound afterwards has been described above. And indeed many when the wound has healed have

## CELSUS

autem cognovi, qui succisa lingua cum abunde superdentes eam promeret, non tamen loquendi facultatem consecutus est. Adeo in medicina, etiam ubi perpetuum est, quod fieri debet, non tamen perpetuum est id, quod sequi convenit.

5 Sub lingua quoque interdum aliquid abscedit, quod fere consistit in tunica doloresque magnos movet.— Quo, si exiguum est, incidi semel satis est; si maius, summa cutis usque ad tunicam excidenda est; deinde utrimque orae hamulis excipiendae et tunica undique circumdato liberanda . . .<sup>1</sup> est, magna diligentia per omnem curationem habita, ne qua maior vena incidatur.

6 Labra autem saepe finduntur eaque res habet cum dolore etiam hanc molestiam, quod sermo prohibetur; qui subinde eas rimas cum dolore diducendo sanguinem citat. Sed has, si in summo sunt, medicamentis curare commodius est, quae ad ulcera oris fiunt. Si vero altius descenderunt, necessarium est tenui ferramento adurere; quod spathae simile quasi transcurrere, non inprimi debet. Postea facienda eadem sunt, quae in auribus adustis exposita sunt (8).

13. At in cervice inter cutem et asperam arteriam tumor increscit: bronchocelen Graeci vocant; quo modo caro hebes, modo umor aliquis melli aquaeve

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<sup>1</sup> *Marx supplies* 'et tota eximenda' *after liberanda and this is translated.*

<sup>a</sup> VII. 8. 2.

<sup>b</sup> Under the name bronchocele Celsus describes an enlargement of the thyroid gland consisting of dark red soft material, which may have undergone cystic degeneration into a honey-like liquid, and also a dermoid cyst of the neck containing hair and calcified material. The term *βρογχοκήλη* was defined by Galen, XIX. 443, who mentions topical applications for the condition several times, and is used by Paulus Aegineta, VI. 38. Hippocrates, *Epid.* VI. 3. 8 (Littre, V. 296), uses *γογγρώνη* for the swelling on the trachea, popularly

spoken; I have, however, known a case when, though the tongue has been undercut so that it could be protruded well beyond the teeth, nevertheless the power of speech has not followed. So it is that in the Art of Medicine even where there is a rule as to what ought to be done, yet there is no rule as to what result ensues.

Sometimes also under the tongue an abscess occurs which is generally enclosed in a coat and causes much pain. If it is small, one cut is enough; if large, the skin over it is to be excised down to the coating; then the two margins are laid hold of with hooks, and the coating is to be freed from what it surrounds and completely extracted, taking great care throughout the operation that no large blood vessel is cut into.

The lips often split, and this not only is painful but has the inconvenience that speech is hindered; as this is apt to enlarge the cracks painfully and so causes them to bleed. If the cracks are superficial they are better treated by the medicaments used for ulcerations of the mouth. But if the fissures have penetrated deeper, it is necessary to burn them with a fine cautery, spearhead shaped, which should as it were skim over them without being pressed down. Afterwards the same is to be done as for cauterization of the ears.<sup>a</sup>

13. Now in the neck between the skin and the trachea,<sup>b</sup> a tumour occurs which the Greeks call bronchocele, it contains now soft flesh, now a humour known as goitre. This word is derived from *guttur*, cf. Juvenal, XIII. 162, *quis tumidum guttur miratur in Alpibus*, and this reference shows that the disease was well known in his day, but it was not until 1541 that Vesalius (*Fabrica*) first drew and described the thyroid gland.

## CELSUS

similis includitur, interdum etiam minutis ossibus pili inmixti. Ex quibus quicquid est, tunica continetur.—Potest autem adurentibus medicamentis curari, quibus summa cutis cum subiecta tunica exestur. Quo facto, siveumor est, profluit; sive quid densius, digitis educitur; tum ulcus sub linamentis sanescit. Sed scalpelli curatio brevior est. Medio tumore una linea inciditur usque ad tunicam; deinde vitiosus sinus ab integro corpore separatur digito, totusque cum velamento suo eximitur. Tum aceto, cui vel salem vel nitrum aliquis adiecit, . . .<sup>1</sup> eluitur, oraeque una sutura iunguntur; ceteraque eadem quae in aliis suturis superiniciuntur leviterque inde, ne fauces . . . urgeatque, deligatur.<sup>2</sup> Si quando autem tunica eximi non potuerit, intus inspergenda adurentia; linamentisque id curandum est et ceteris pus moventibus.

14. Sunt etiam circa umbilicum plura vitia, de quibus propter raritatem inter auctores parum constet. Verisimile est autem id a quoque praetermissum, quod ipse non cognoverat; a nullo id, quod non viderat, fictum. Commune omnibus est umbilicum indecore prominere: causae requiruntur. Meges tres has posuit: modo intestinum eo inrumpere; modo omentum; modo umorem. Sostratus nihil de omento dixit: duobus iisdem adiecit carnem ibi interdum increscere, eamque modo integram esse, modo carcinomati similem. Gorgias ipse quoque

<sup>1</sup> *Marx notes that ulcer has fallen out before eluitur.*

<sup>2</sup> *Marx supplies astringat fascia after fauces.*

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<sup>a</sup> Galen, VIII. 53, mentions two cases of this operation in which the surgeon had injured the recurrent laryngeal nerves lying behind the thyroid gland and had so caused loss of voice.

somewhat like honey or water, sometimes also hairs mixed up with minute bones; whatever the contents, they are enclosed in a coat. Treatment is possible by caustics which eat away the skin together with the underlying tunic. When this has been done, if there is humour inside, it flows out; if anything solid, it is turned out with the finger; the wound then heals under lint dressings. But treatment by the knife is shorter.<sup>a</sup> A linear incision is made over the middle of the tumour down to the tunic; then the morbid pouch is separated by the finger from the sound tissue, and the whole is removed along with its covering. Next the wound is washed out with vinegar to which either salt or soda has been added, and the margins brought together by one suture; the rest of the applications are the same as in other cases of sutured wounds and after that it is lightly bandaged so as not to trouble the throat by pressure. But if it is impossible to take out the tunic, caustics are to be dusted into its interior, and it is then dressed with lint and other suppuratives.

14. There are also around the navel many lesions about which, owing to their rarity, there is little agreement among authorities. But it is probable that each has passed over what was unknown to himself; while no one has depicted what he had not seen. Common to all cases is an ugly prominence of the umbilicus, and the causes are sought for. Meges gave three; rupture into it of the intestine, of the omentum, or of humour. Sostratus said nothing about the omentum; in addition to the other two he said that at times there was increase of flesh in that part, sometimes sound, sometimes cancerous. Gorgias himself also omitted mention of the

## CELSUS

omentum mentionem omisit: sed eadem tria causatus, spiritus quoque interdum eo dixit inrumpere. Heron omnibus his quattuor positus, et omenti mentionem habuit et eius, quod . . .<sup>1</sup> simul et omentum et intestinum habuerit. Quid autem horum sit, his indiciis cognoscitur. Ubi intestinum prolapsum est, tumor neque durus neque mollis est, omni frigore minuitur: non solum sub omni calore sed etiam retento spiritu  
3 crescit. Sonat interdum, atque ubi resupinatus est aliquis, delapso intestino ipse desidit. Ubi vero omentum est, cetera similia sunt; tumor mollior et, ab ima parte latus, extenuatus in vertice est; si quis adprehendit, elabitur. Ubi utrumque est, indicia quoque mixta sunt, et inter utrumque molles: at caro durior est, semperque etiam resupinato corpore tumet, prementique non cedit, prioribus facile cedentibus. Si vitiosa est, easdem notas habet, quas in carcinomate (V. 28. 2 A) exposui.  
4 Umor autem si premitur, circumfluit: at spiritus pressus cedit, sed protinus redit, resupinato quoque corpore tumorem in eadem figura tenet. Ex his id, quod ex spiritu vitium est, medicinam non admittit; caro quoque carcinomati similis cum periculo tractatur; itaque omittenda est. Sana excidi debet idque vulnus linamentis curari. Umorem quidem . . .<sup>2</sup> vel inciso summo tumore effundunt, et vulnus iisdem

<sup>1</sup> *Marx supplies* genus causam *after* quod.

<sup>2</sup> *Marx supplies* vel acu perforato.

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<sup>a</sup> *vitiosa* = *κακοίθης*, malignant, V. 28. A, and Appendix, p. 592. <sup>b</sup> VII. 15. 1.

omentum; but he gave the same number of causes, three, and said that occasionally wind also ruptured into it. Heron having given all these four causes, made mention both of the omentum and of that form which was caused simultaneously by the omentum and intestine. But which of these causes it is, may be recognized by the following indications. When intestine has prolapsed the swelling is neither hard nor soft; it is reduced by anything cold; and it increases not only under heat of all kinds but also when the breath is held. At intervals it rumbles, and if the patient lies down on his back the swelling subsides, as the intestine has slipped back. But when it is the omentum, whilst other signs are similar, the swelling is softer, broad at its base, thinned out towards its apex; if any one grasps it, it slips away. When both intestine and omentum have prolapsed, the signs are mingled, and the softness is intermediate between the two; but the flesh is harder, and even when the patient lies on his back there is always swelling, and it does not yield to pressure, to which the preceding forms yield readily. If it is malignant the signs are the same as I have stated for cancer.<sup>a</sup> Humour fluctuates when pressed upon; wind, on the other hand yields under pressure, but returns at once, also the swelling retains the same shape when the patient lies down on his back. Of these varieties, the disorder due to wind does not admit of treatment; also cancerous flesh is dangerous to treat, so should be left alone. Sound flesh ought to be cut away and the wound dressed with lint. Some let out humour,<sup>b</sup> <either by perforating with a needle>, or by cutting into the apex of the tumour, and then similarly dressing the wound with lint. As to the

## CELSUS

linamentis curant. In reliquis variae sententiae sunt.  
5 Ac resupinandum quidem corpus esse res ipsa  
testatur, ut in uterum, sive intestinum sive omentum  
est, delabatur. Sinus vero umbilici tum vacus a  
quibusdam duabus regulis exceptus est, vehementer-  
que earum capitibus deligatis ibi emortus: a quibus-  
dam, ad imum acu traiecta duo lina ducente, deinde  
6 utriusque lini duobus capitibus diversae partes  
adstrictae; quod in uva quoque oculi fit: nam sic id,  
quod supra vinculum est, moritur. Adiecerunt qui-  
dam, ut antequam vincirent, summum una linea  
inciderent exciderentque: quo facilius digito de-  
misso quod illuc inrupisset depellerent; tum deinde  
vinxerunt. Sed abunde est iubere spiritum continere,  
ut tumor quantus maximus esse potest, se ostendat;  
tum imam basem eius atramento notare, resupinato-  
que homine digitis tumorem eum premere, ut, si  
7 quid delapsum non est, manu cogatur. Post haec  
umbilicum adtrahere, et qua nota atramenti est, lino  
vehementer adstringere; deinde partem superiorem  
aut medicamentis aut ferro adurere, donec emoriatur,  
atque ut cetera usta ulcus nutrire. Idque non solum  
ubi intestinum vel omentum vel utrumque est, sed  
etiam ubi umor est, optime proficit. Sed ante quae-  
dam visenda sunt, ne quod ex vinculo periculum sit.  
Nam curationi neque infans neque aut robustus annis  
aut senex aptus est, sed . . .<sup>1</sup> a septimo fere anno ad

<sup>1</sup> *Marx supplies puer after sed.*

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<sup>a</sup> VII. 7. 11; and diagram, p. 344.

rest of the treatment opinions vary. Of course the patient must be laid on his back, in order that the swelling, whether it be intestine or omentum, may slip back into the abdomen. But when the navel sac was then empty, some caught it between two little rods, and fastened the ends of the rods tightly together, so that it mortified there; some passed a needle doubly threaded through the base of the sac, then knotted the two ends of each thread on opposite sides, as is done also in staphyloma of the eye;<sup>a</sup> for in this way that part beyond the ligatures mortifies. Some, in addition, before tying the ends also cut into the protrusion along a marked line and excised it: in order that they might more easily insert a finger and push back whatever had ruptured into the sac; then at length they tied the ligatures. But it is quite enough to order the patient to hold his breath so that the tumour shows itself at its largest; then to mark its base with ink; next with the patient on his back, to compress the tumour with the fingers, so that whatever has not slipped back of itself is forced back by the hand. After this the umbilicus is drawn forwards, and tightly constricted with flaxen thread along the marks of the ink; next the part beyond the ligature is either burnt with caustics or with the cautery, until it mortifies, after which the wound is dressed like other burns. This method answers best, not only when it is intestine or omentum or both, but even when it is humour. But first precautions must be taken against any danger from the ligature. For neither an infant nor a robust adult nor an old man is suited to this treatment, but a child between seven and fourteen years of

## CELSUS

8 quartum decimum. Deinde ei corpus idoneum est id, quod integrum est: at quod mali habitus est, quodve papulas, inpetiginem, similiaque habet, idoneum non est. Levibus quoque tumoribus facile subvenitur: at in eorum, qui nimis magni sunt, curatione periculum est. Tempus autem anni autumnale et hibernum vitandum: ver est idoneum maxime ac prima aestas non aliena est. Praeter haec abstinere pridie debet; neque id satis est, sed alvus quoque ei ducenda est, quo facilius omnia, quae excesserunt, intra uterum considant.

15. Aquam is, qui hydropici sunt, emitti oportere alias (III. 21. 14 *seqq.*) dixi: nunc quemadmodum fiat, dicendum est. Quidam autem sub umbilico, fere quattuor interpositis digitis, in sinistra parte; quidam ipso umbilico perforato id facere consuerunt: quidam cute primum adusta, deinde interiore abdomine inciso, quia, quod per ignem divisum est, minus celeriter coit. Ferramentum autem demittitur, magna cura habita, ne qua vena incidatur. Id tale esse debet, ut fere tertiam digiti partem latitudo mucronis impleat; demittendumque ita est, ut membranam quoque transeat, quæ caro ab interiore parte finitur; eo tum plumbea aut aenea fistula coicienda est, vel recurvatis in exteriorem partem labris, vel in media circumsurgente quadam mora, ne tota intus delabi possit. Huius ea pars, quae intrat, paulo longior esse debet quam quae extra, ut ultra ulteriorem membranam procedat.

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<sup>a</sup> III. 21. 14.

<sup>b</sup> VII. 14. 4.

age. Secondly a suitable body for it is one that is sound, but where there is general ill-health, or pustules or eruptions, and such like, it is not suitable. The smaller tumours also are readily curable, but there is danger in the treatment of those which are excessively large. Moreover the autumn and winter seasons should be avoided, the spring is the best season, early summer is not unfavourable. The patient should also fast on the day before the operation, and that is not enough, but the bowels also are to be moved by a clyster, in order that all that has extruded may more readily return into the abdomen.

15. I have said elsewhere that in those who are dropsical the water ought to be let out:<sup>a</sup> here I must describe how this should be done. Now some make the perforation about four fingers breadth below the navel, and to the left; some make it by perforating the navel itself;<sup>b</sup> some first burn through the skin and then cut into the abdominal cavity, because flesh which has been divided by cauterly heals less quickly. Now when entering the knife great care should be taken that no blood vessel is cut into. The knife must be such that its point should be about the third of a finger's breadth, and it should be so entered as to penetrate the membranc separating the flesh from the interior; then a lead or bronze tube should be inserted, either with lips curved back at its outer end, or with a collar round the middle so that the whole of it cannot slip inside. The part of the tube within the abdominal cavity should be a little longer than the part outside, in order that it may project inwards beyond the deeper membrane. Through this tube

## CELSUS

Per hanc effundendus umor est; atque ubi maior pars eius evocata est, cludenda demisso linteolo fistula est, et in vulnere, si ustum non est, relinquenda; deinde per insequentes dies circa singulas heminas emittendum, donec nullum aquae vestigium appareat. Quidam tamen etiam non usta cute protinus fistulam recipiunt, et super vulnus spongiam expressam deligant; deinde postero die rursus fistulam demittunt (quod recens vulnus paulum diductum patitur), ut, si quid umoris superest, emittatur; idque bis ita fecisse contenti sunt.

16. Nonnumquam autem venter ictu aliquo perforatur, sequiturque ut intestina evolvantur. Quod ubi incidit, protinus considerandum est, an ea integra sint, deinde an is color suus maneat. Si tenuius intestinum perforatum est, nihil profici posse iam rettuli (V. 26. 2). Latius intestinum sui potest, non quo certa fiducia sit, sed quo[d] dubia spes certa desperatione sit potior: interdum enim glutinatur. Tum si utrumlibet intestinum lividum aut pallidum aut nigrum est, quibus illud quoque necessario accedit, ut sensu careat, medicina omnis inanis est. Si vero adhuc ea sui coloris sunt, cum magna festinatione succurrendum est: momento enim alienantur, externo et insueto spiritu circumdato. Resupinandus autem homo est coxis erectioribus; et si angustius vulnus est, quam ut intestina commode refundantur, incidendum est, donec satis pateat. Ac si iam sicciora sunt intestina, perlucenda aqua

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\* 250 c.cm.

† V. 26. 2.

the humour is let out; and when the greater part has escaped, the tube is to be closed by a lint plug, and left in the wound if it was not burnt with a cautery; then on each of the following days about one hemina <sup>a</sup> is let out, until there appears no trace of fluid. Some, however, even when the skin has not been cauterized, take out the tube forthwith, and then bandage on the wound a squeezed-out sponge; then on the next day they pass in a tube again (which the recent wound admits if it is slightly stretched) in order that any remaining fluid may be let out. They are satisfied when this has been done twice in this manner.

16. Sometimes the abdomen is penetrated by a stab of some sort, and it follows that intestines roll out. When this happens we must first examine whether they are uninjured, and then whether their proper colour persists. If the smaller intestine has been penetrated, no good can be done, as I have already said.<sup>b</sup> The larger intestine can be sutured, not with any certain assurance, but because a doubtful hope is preferable to certain despair; for occasionally it heals up. Then if either intestine is livid or pallid or black, in which case there is necessarily no sensation, all medical aid is vain. But if intestines have still their proper colour, aid should be given with all speed, for they undergo change from moment to moment when exposed to the external air, to which they are unaccustomed. The patient is to be laid on his back with his hips raised; and if the wound is too narrow, for the intestines to be easily replaced, it is to be cut until sufficiently wide. If the intestines have already become too dry, they are to be bathed with water

## CELSUS

sunt, cui paulum admodum olei sit adiectum. Tum minister oras ulceris leviter diducere manibus suis vel etiam duobus hamis interiori membranae iniectis debet: medicus priora semper intestina, quae posteriora prolapsa sunt, condere sic, ut orbium singulorum locum servet. Repositis omnibus, leviter homo concutiendus est; quo fit, ut per se singula intestina in suas sedes deducantur et in his considant. His conditis, omentum quoque considerandum est, ex quo, si quid iam nigri [emortui] est, forfice excidi debet; si quid integrum est, leviter super intestina deduci. Sutura autem neque summae cutis neque interioris membranae per se satis proficit, sed utriusque. Et quidem duobus linis inicienda est, spissior quam alibi, quia et rumpi facilius motu ventris potest, et non aequè magnis inflammationibus pars ea exposita est. Igitur in duas acus fila coiicienda, eaeque duabus manibus tenendae; et prius interior membranae sutura inicienda est sic, ut sinistra manus in dexteriore ora, in sinisteriore dextra a principio vulneris orsa ab interiore parte in exteriorem acum mittat. Quo fit, ut ab intestinis ea quidem pars semper acuum sit, quae retusa est. Semel utraque parte traiecta, permutandae acus inter manus sunt, ut ea sit in dextra, quae fuit in sinistra; ea veniat in sinistram, quam dextra continuit; iterumque eodem modo per oras

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<sup>a</sup> The following directions assume that the surgeon stood on the patient's left side with his back to the patient's face so that the latter could not see when a stitch was to be inserted.

<sup>b</sup> The parietal layer of the peritoneum and the muscular wall.

to which a small quantity of oil has been added. Next the assistant should gently separate the margins of the wound by means of his hands, or even by two hooks inserted into the inner membrane: the surgeon always returns first the intestines which have prolapsed the later, in such a way as to preserve the order of the several coils. When all have been returned, the patient is to be shaken gently: so that of their own accord the various coils are brought into their proper places and settle there. This<sup>a</sup> done, the omentum too must be examined, and any part that is black [dead] is to be cut away with shears; what is sound is returned gently into place in front of the intestines. Now stitching of the surface skin only or of the inner membrane<sup>b</sup> only is not enough, but both must be stitched. And there must be two rows of stitches, set closer together than in other places, partly because they can be broken here more easily by the abdominal movement, partly because that part of the body is not specially liable to severe inflammations. Therefore two needles are to be threaded and one is to be held in each hand; and the stitches are to be inserted, first through the inner membrane, so that the surgeon's left hand pushes the needle from within outwards through the right margin of the wound, and his right hand through the left margin, beginning from one end of the wound. The result is that it is the blunt end of the needle which is always being pushed away from the intestines. When each margin has been once traversed, the hands interchange needles, so that into the right hand comes the needle which was in the left, and into the left the needle which was in the right; and again, after the same

## CELSUS

immittendae sunt; atque ita tertio et quarto deincepsque permutatis inter manus acubus, plaga includenda. Post haec eadem fila, eaedemque acus ad cutem transferendae, similique ratione ei quoque parti sutura inicienda, semper ab interiore parte acubus venientibus, semper inter manus traiectis. Dein glutinantia inicienda, quibus aut spongiam aut succidam lanam ex aceto expressam accedere debere manifestius est, quam ut semper dicendum sit. Inpositis his, leviter deligari venter debet.

17. Interdum tamen vel ex ictu aliquo vel retento diutius spiritu vel sub gravi fasce interior abdominis membrana superiore cute integra rumpitur. Quod feminis quoque ex utero saepe evenire consuevit; fitque praecipue circa ilia. Sequitur autem, cum superior caro mollis sit, ut non satis intestina contineat, isque intenta cutis indecore intumescat.—

B Atque id quoque aliter ab aliis curatur. Quidam enim per acum duobus linis ad imam basem inmissis sic utrimque devinciunt, quemadmodum et in umbilico (14. 5) et in uva (7. 11) positum est, ut quicquid super vinculum est emoriatur: quidam medium tumorem excidunt ad similitudinem myrtei foli, quod semper eodem modo servandum esse iam posui (2. 6), et tum oras sutura iungunt. Commodissimum est autem resupinato corpore experiri manu, qua parte is tumor maxime cedat, quia

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<sup>a</sup> VII. 14. 5.

<sup>b</sup> VII. 7. 11; and diagram, p. 344.

<sup>c</sup> VII. 2. 6.

method they are to be passed through the margins; and when for the third and fourth time, the needles have changed hands the wound is to be closed. Afterwards the same threads and the same needles are now transferred to the skin, and stitches are to be inserted by a like method into this as well, always directing the needles from within outwards, and with the same change, between the hands. It is too obvious to need constantly repeating that agglutinants are then to be put on with the addition either of a sponge or of greasy wool, squeezed out of vinegar. Over this application the abdomen should be lightly bandaged.

17. Sometimes, however, whether from some blow, or from holding the breath too long, or from carrying a heavy weight, the inner membrane of the abdomen is ruptured, whilst the skin over it is entire. This often occurs too in the case of women from child-bearing, and it particularly takes place in the iliac regions. But it follows since the overlying flesh is soft, that it does not hold the intestines properly in place and that the skin is stretched by them and forms an ugly swelling. And this too is treated differently by different surgeons. For some pass two threads through the base by means of a needle, and then tie on each side, as has been described for the navel <sup>a</sup> and for staphyloma <sup>b</sup>, in order that what is beyond the ligature may mortify; some excise the middle of the swelling by a myrtle-leaf shaped incision, which as I said <sup>c</sup> is the method which should always be adopted, and then they unite the edges by stitching. But the best way is with the patient on the back, to try with the hand in which part the swelling is most yielding, for of necessity it is at

## CELSUS

necesse est ea parte rupta membrana sit; quaque integra est, ea magis obnitatur; tum qua rupta videbitur, immittendae scalpello duae lineae sunt, ut excisso medio interior membrana utrimque recentem plagam habeat, quia quod vetus est, sutura non coit. Loco patefacto, si qua parte membrana non novam plagam sed veterem habet, tenuis excidenda habena est, quae tantum oras eius exulceret. Cetera, quae ad suturam reliquamque curationem pertineant, supra (16. 3 *seqq.*) comprehensa sunt.

2 Praeter haec evenit, ut in quorundam ventribus varices sint; quarum quia nulla alia curatio est, quam quae in cruribus esse consuevit,<sup>1</sup> tum eam partem explanaturus, hanc quoque eo (31) differo.

18. Venio autem ad ea, quae in naturalibus partibus circa testiculos oriri solent; quae quo facilius explicem, prius ipsius loci natura paucis proponenda est. Igitur testiculi simile quiddam medullis habent: nam sanguinem non emittunt et omni sensu carent: dolent autem in ictibus et inflammationibus tunicae, quibus ii continentur. Dependent vero ab inguinibus per singulos nervos, quos cremasteras Graeci vocant, cum quorum utroque binae descendunt et venae et arteriae. Haec autem tunica conteguntur tenui, nervosa, sine sanguine, 2 alba, quae elytroides a Graecis nominatur. Super ea valentior tunica est, quae interiori vehementer

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<sup>1</sup> *The text is corrupt. Marx suggests substituting the word cum for tum and inserting postea sim before explanaturus, and this is translated.*

that part that the inner membrane is ruptured, and where it is entire the swelling is more resistant. Where the rupture is seen to be, two linear incisions are made with a scalpel, so that when what lies between has been excised, the inner membrane has a wound freshly made on each side, because stitching will not unite a lesion of long standing. When on exposure any part of the membrane presents not a recent but an old rupture, a thin strip is to be pared away, which only just makes the margins raw. All the directions for stitching and further treatment have been given above.

Besides the above there are sometimes varicose veins upon the abdominal wall, and because there is no other treatment for these than what is usual for the legs (since I shall treat of that part later), I will defer this too till then.<sup>a</sup>

18. Now I come to those lesions which are apt to arise in the genital parts around the testicles; and to explain them more easily, the nature of the said region must briefly be described first. The testicles then are somewhat like marrow, for they do not bleed and they lack all feeling; but the coverings by which they are enclosed give pain both when injured and inflamed. Now the testicles hang from the groins, each by a cord which the Greeks call the cremaster<sup>b</sup> with each of which descends a pair of veins and a pair of arteries. And these are ensheathed in a tunic, thin, fibrous, bloodless, white, which is called by the Greeks elytroides.<sup>c</sup> Outside this is a stronger tunic, which at its lowest part is

<sup>b</sup> κρεμαστήρες (Galen IV. 635) = "suspenders"; these muscles, with other structures, formed the spermatic cord.

<sup>c</sup> ἐλυτροειδής χιτῶν (the sheath-like coat) = tunica vaginalis.

ima parte inhaeret: darton Graeci vocant. Multae deinde membranulae venas et arterias eosque nervos comprehendunt; atque inter duas quoque tunicas a superioribus partibus leves parvulaeque sunt. Hac-  
 3 tenus propria utrique testiculo velamenta et auxilia sunt: communis deinde utrique omnibusque interioribus sinus est, qui iam conspicitur a nobis: oscheon Graeci, scrotum nostri vocant; isque ab ima parte mediis tunicis leviter innexus est, a superiore tantum  
 4 circumdatus. Sub hoc igitur plura vitia esse consuerunt; quae modo ruptis tunicis, quas ab inguinibus incipere proposui (1), modo his integris fiunt. Siquidem interdum vel ex morbo primum inflammatur, deinde postea pondere abrumpitur; vel ex ictu aliquo protinus rumpitur tunica, quae diducere ab inferioribus partibus intestina debuit; tum pondere eo devolvitur aut omentum aut etiam intestinum; idque ibi reperta via paulatim ab inguinibus in inferiores quoque partes nissum subinde nervosas tunicas et ob id eius rei patientes diducit: enterocelen et epiplocelen Graeci vocant: apud nos indecorum sed commune his hirneae nomen est.  
 4 Deinde, si descendit omentum, numquam in scroto tumor tollitur, sive inedia fuit, sive corpus huc illucve conversum aut aliquo modo conlocatum est; itemque, si retentus est spiritus, non magnopere increscit; tactu vero inaequalis est et mollis et lubricus. At si intestinum quoque descendit, tumor

<sup>a</sup> This membrane is immediately below the skin and closely connected with it.

<sup>b</sup> Scrotum = scortum (hide); the more usual Greek form was *ᾠσχη*, which is always found in Hippocrates.

<sup>c</sup> *κήλη* = hernial swelling (hernia carnosae); *ἐντεροκήλη* is intestinal hernia, *ἐπιπλοκήλη* omental hernia.

closely adherent to the inner one; the Greeks call it *dartos*.<sup>a</sup> Further, many fine membranes hold together the veins, and the arteries, and the cords aforesaid, and also in between the two tunics there are some fine and very small membranes, descending from the parts above. Thus far the coverings and supports belong to each testicle separately; next common to both and to all within is the pouch which is now visible to us; the Greeks call it *oscheon*,<sup>b</sup> we the scrotum; and at its lowest part this is slightly connected with the middle coverings, higher up it is only surrounded by them. Now, underneath the scrotal covering many lesions are apt to occur, sometimes after the rupture of the coverings which, as I have said, begin from the groins, sometimes when they are uninjured. Since at times either owing to disease there is first inflammation, then afterwards a rupture from the weight; or after some blow there, there is a direct rupture of the covering which ought to separate the intestines from the parts below; then either omentum, or it may be intestine, rolls down by its own weight; this having found a way gradually from the groins into the parts below as well, there separates by its pressure the coverings which are fibrous and therefore give way. The Greeks call the condition *enterocele*<sup>c</sup> and *epiplocele*, with us the ugly but usual name for it is *hernia*.

Now if omentum has come down, the tumour in the scrotum never disappears, either if the patient fasts, or if his body is turned from side to side, or lies in some special position; again, if the breath is held, it does not increase to any extent; to the touch it seems uneven and soft and slippery. But if intestine has also come down this tumour is with-

## CELSUS

is sine inflammatione modo minuitur, modo increscit  
estque fere sine dolore et cum mollitie. Cum  
quiescit aliquis aut iacet, interdum ex toto desidit;  
interdum sic dividitur, ut in scroto exiguae reliquiae  
5 maneant. At clamore et satietate, et si sub aliquo  
pondere is homo nisus est, crescit: frigore omni  
contrahitur, calore diffunditur; estque tum scrotum  
et rotundum et tactu leve: idque, quod subest,  
lubricum est; si pressum est, ad inguina revertitur,  
dimissumque iterum cum quodam quasi murmure  
devolvitur. Et id quidem in levioribus malis evenit:  
nonnumquam autem stercore accepto vastius tumet,  
retroque compelli non potest, adfertque tum dolorem  
6 et scroto et inguinibus et abdomini. Nonnumquam  
stomachus quoque adfectus primum rufam bilem per  
os reddit, deinde viridem, quibusdam etiam nigram.  
Integris vero membranis interdum eam partem  
umor dstringit. Atque eius quoque species duae  
sunt: nam vel inter tunicas is increscit vel in mem-  
branis, quae ibi circa venas et arterias sunt, ubi eae  
gravatae occalluerunt. Ac ne ei quidem umori, qui  
inter tunicas est, una sedes est: nam modo inter  
summam et mediam, modo inter mediam et imam  
7 consistit. Graeci communi nomine, quicquid est,  
hydrocelen appellant: nostri, ut scilicet nullis dis-  
criminibus satis cognitis, haec quoque sub eodem  
nomine quo priora habent. Signa autem quaedam

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<sup>a</sup> VII. 20. 2, 4.

<sup>b</sup> That is, between the scrotum (combined with the dartos) and the tunica vaginalis, or between the tunica vaginalis and the tunica albuginea; the latter is not referred to in the description given above, §§ 1 and 2.

<sup>c</sup> ὑδροκήλη (ὑδωρ, water), hernia aquosa.

out inflammation, sometimes it diminishes, sometimes increases, and it is generally painless and soft. When the patient is quiescent or lying down, it disappears, at times altogether; sometimes it becomes divided so that very small remnants stay in the scrotum. But after shouting or over-eating, or if the patient has been strained by a weight of any sort, it increases; under all kinds of cold it shrinks, under heat it enlarges; then the scrotum becomes globular and smooth to the touch; and within the scrotum the intestine slips about, when pressed upon it reverts towards the groin, when released it rolls down again with a sort of murmur. That is what happens in slight cases; but at times, when faeces have been taken in, it swells more largely, it cannot be forced back, and it then brings on pain both in the scrotum and in groins and abdomen. At times the stomach also becomes affected, and there is an issue from the mouth,<sup>a</sup> first of red, then of green, and even in some of black bile. At times too, whilst the membranes remain entire, fluid distends the scrotum. There are two forms of this affection: for the fluid collects either between the coverings or in the membranes surrounding the veins and arteries, and then these membranes become thickened and weighted down. And even if the fluid lies between the membranes it is not confined to one place; it may lie between the superficial and middle membrane, or between the middle and inner membranes.<sup>b</sup> The Greeks have one general name, they call it hydrocele,<sup>c</sup> whichever kind it is; our people, not knowing enough perchance to make distinctions, call it by the same name as the preceding disorder. Now

## CELSUS

communia sunt, quaedam propria: communia, quibus umor deprehenditur; propria, quibus locus. Umorem subesse discimus, si tumor est numquam ex toto se remittens, sed interdum levior aut propter famem aut propter febriculam, maximeque in pueris; isque mollis est, si non nimius umor subest: at si is vehementer increvit, renititur sicut uter repletus et arte adstrictus. Venae quoque in scroto inflantur, et, si digito pressimus, cedit umor circumfluensque id, quod non premitur, attollit et tamquam in vitro cornuve per scrotum apparet, estque, quantum in ipso est, sine dolore. Sedes autem eius sic deprehenditur. Si inter summam mediamque tunicam est, cum digitis duobus pressimus, paulatim umor inter eos . . .<sup>1</sup> revertens subit; scrotum †<sup>2</sup> ipsius albidius: si ducitur, aut nihil aut parvulum intenditur; testiculus ea parte neque visu neque tactu sentitur. At si sub media tunica est, intentum scrotum magis se attollit, adeo ut superior coles sub tumore eo delitescat. Praeter haec aequae integris tunicis ramex innascitur: cirsocele Graeci appellant. Venae intumescunt, eaeque intortae conglomerataeque a superiore parte vel ipsum scrotum implent vel mediam tunicam vel imam: interdum etiam sub ima tunica circa ipsum testiculum ner-

<sup>1</sup> *Marx inserts* recedentes before revertens and this is translated.

<sup>2</sup> *The text is uncertain, Marx suggests* ilibus for ipsius; *V. d. Linden* remissius et before albidius.

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<sup>a</sup> Here Celsus describes an everyday test to see if the fluid "fluctuates."

<sup>b</sup> κίρσός = varix or ramex. A scrotal varix is described VII. 22, an inguinal varix VII. 24. Varicocele, the term now used, is not found in Celsus.

there are signs, some common to all cases, some particular: the common one is the existence of fluid; the particular, the situation of it. We learn that there is fluid underneath, if the swelling never disappears entirely although it is at times less, whether from fasting or feverishness, and especially in boys; the tumour is soft when the fluid contained is only small in amount; but if it increases to a great extent, the tumour becomes tense like a wineskin which has been filled and tightly tied. Also veins in the wall of the scrotum are distended; and upon pressure with the finger the fluid recedes, and as it flows round raises up the part where there is no pressure and is seen through the scrotal wall as if it were contained in a glass or horn vessel; and however much is there there is no pain. But the situation of the fluid is recognized as follows:<sup>a</sup> if it is between the scrotal wall and the middle membrane, when we press with two fingers, the humour gradually comes up, returning as the fingers are withdrawn; the scrotal wall is whiter than natural; if it is drawn upon, it stretches either not at all, or very little; the testicle on that side cannot be seen or felt. But if it is under the middle membrane, the scrotum is stretched and more raised up, so that the root of the penis is concealed under the swelling. Besides the above a varicose affection which the Greeks call *cirsocele*<sup>b</sup> occurs, in which also the membranes are intact. The veins become swollen, and when twisted, and massed together at the upper part, they distend the scrotum generally, or the middle or the inner covering; sometimes they grow even beneath the inner covering around the actual

10 vumque eius increscunt. Ex his eae, quae in ipso scroto sunt, oculis patent: eae vero, quae mediae imaeve tunicae insident, ut magis conditae non aequae quidem cernuntur, sed tamen etiam visui subiectae sunt, praeterquam quod et tumoris aliquid est pro venarum magnitudine ac modo, et id prementi magis renititur ac per ipsos venarum toros inaequale est et, qua parte id est, testiculus magis iusto dependet. Cum vero etiam super ipsum testiculum nervumque eius id malum increvit, aliquanto longius testiculus ipse descendit, minorque altero fit, ut pote alimento amisso. Raro sed aliquando caro quoque inter tunicas increscit: sarcocelen  
 11 Graeci vocant. Interdum etiam ex inflammatione tumet ipse testiculus, ac febres quoque adfert; et nisi celeriter ea inflammatio conquievit, dolor ad inguina atque ilia pervenit, partesque eae intumescunt; nervus, ex quo testiculus dependet, plenior fit simulque indurescit. Super haec inguen quoque nonnumquam †<sup>1</sup> varice implicetur: bubonocelen appellant.

19. His cognitis, de curatione dicendum est, in qua quaedam communia omnium sunt, quaedam propria singulorum. Prius de communibus dicam. Loquar autem nunc de iis, quae scalpellum desiderant: nam vel quae sanari non possunt, vel aliter nutriri debeant, dicendum erit, simul ad species singulas venero. Inciditur autem interdum inguen, interdum scrotum. In utraque curatione homo ante

<sup>1</sup> *Marx suggests fit ut ramice for varice.*

<sup>a</sup> σαρκοκήλη (fleshy tumour) = hernia carnosae (VII. 23).

<sup>b</sup> βουβωνοκήλη (groin tumour) = inguinal hernia.

testicle and its cord. Of these the veins in the scrotal wall can be seen; but those situated in the middle or inner coverings, being more deeply placed, are not indeed equally visible but even these can be seen, especially because there is a certain amount of swelling in proportion to the size and form of the veins, and this is more resistant to pressure, and also is rendered irregular owing to the bulgings of the veins, whilst the testicle on that side hangs lower down than it ought. But when the disease has spread also over the testicle and its cord, the testicle sinks a little lower, and becomes smaller than its fellow, in as much as its nutrition has become defective. Sometimes, though rarely, flesh also grows between the tunics; the Greeks call this sarcocele.<sup>a</sup> At times also the testicle itself swells owing to inflammation and this causes fever as well. And unless this inflammation quickly subsides, pain spreads to the inguinal and iliac regions, and these parts swell; the cord from which the testicle hangs becomes fuller, and at the same time it hardens. Besides this it happens sometimes that the groin is occupied by a rupture; they call it bubonocele.<sup>b</sup>

19. When these lesions have been recognized their treatment must be discussed; in this some methods are common to all, some peculiar to particular kinds. I shall discuss first what is common to all. But I shall now speak of those cases demanding the knife: for those which are incurable, or should be cared for otherwise, will be mentioned as I come to the separate kinds. Now sometimes the inguinal region has to be cut into, sometimes the scrotum. In either case the man for three days

## CELSUS

triduum bibere aquam, pridie abstinere etiam a cibo debet: ipso autem die collocari supinus; deinde si inguen incidendum est, idque iam pube contegitur, ante radendum est: et tunc extenso scroto, ut cutis inguinis intenta sit, id incidendum sub imo ventre, qua cum abdomine tunicae inferiores committuntur.

- 2 Aperendum autem audacter est, donec summa tunica, quae ipsius scroti est, incidatur, perveniatque ad eam, quae media. Plaga facta foramen deorsum versus subest. In id demittendus est sinistrae manus digitus index, ut deductis intervenientibus membranulis sinum laxet. Minister autem sinistra manu comprehendens scrotum susum versum [eum] debet extendere, et quam maxime ab inguinibus abducere, primum cum ipso testiculo, dum medicus omnes membranulas, quae supra mediam tunicam sunt, si digito deducere non potest, scalpello abscidat; deinde sine eo, ut is delapsus ipsi plagae iungatur digitoque inde promatur, et super ventrem cum duabus suis tunicis collocetur.
- 3 Inde si qua vitiosa sunt, circumcidenda sunt; in quibus cum multae venae discurrant, tenuiores quidem protinus praecidi possunt; maiores vero ante longiore lino deligandae sunt, ne periculose sanguinem fundant. Si media tunica vexata erit aut sub ea malum increverit, excidenda erit sic, ut alte ad ipsum inguen praecidatur. Infra tamen non tota

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<sup>a</sup> V II. 18. 2.

<sup>b</sup> See p. 394, note b.

before should drink water, and for the day before abstain also from food: on the day itself he must lie on his back; next if the groin has to be cut into, and if the pubes is already covered by hair, this is to be shaved off beforehand: and then after stretching the scrotum, so that the skin of the groin is rendered tense, the cut is made below the abdominal cavity, where the membranes below are continuous with the abdominal wall. Now the laying open is to be done boldly, until the outer tunic, that of the scrotum itself, is cut through, and the middle tunic reached. When an incision has been made, an opening presents leading deeper. Into this the index finger of the left hand is introduced, in order that by the separation of the intervening little membranes<sup>a</sup> the hernial sac may be freed. Next the assistant grasping the scrotum with his left hand should stretch it upwards, and draw it away as far as possible from the groins, at first including the testicle itself until the surgeon cuts away with the scalpel all the fine membranes which are above the middle tunic if he is unable to separate it with his finger; then the testicle is let go in order that it may slip downwards, and show in the wound and then be pushed out by the surgeon's finger, and laid along with its two tunics<sup>b</sup> upon the abdominal wall. There whatever is diseased is cut round and away, in the course of which many blood vessels are met with; the smaller ones can be summarily divided; but larger ones, to avoid dangerous bleeding, must be first tied with rather long flax thread. If the middle tunic be affected, or the disease has grown beneath it, it will have to be cut away even as high as the actual groin. Lower

## CELSUS

demenda est: nam quod ad basin testiculi vehementer cum ima tunica conexum est, excidi sine  
4 summo periculo non potest; itaque ibi relinquendum est. Idem in ima quoque tunica, si laesa est, faciendum est. Sed non a summa inguinis plaga verum infra paulum ea abscidenda, ne laesa abdominis membrana inflammationes moveat. Neque tamen nimium ex ea susum relinquendum est, ne postea sinuetur et sedem eidem malo praestet. Purgatus ita testiculus per ipsam plagam cum venis et arteriis et nervo suo leviter demittendus est, videndumque, ne sanguis in scrotum descendat neve  
5 concretus aliquo loco maneat. Quae ita fient, si venis vinciendo medicus prospexerit: lina, quibus capita earum continebuntur, extra plagam dependere debebunt; quae pure orto sine ullo dolore excident. Ipsi autem plagae iniciendae duae fibulae sunt, et insuper medicamentum, quo glutinetur. Solet autem interdum ab altera ora necessarium esse aliquid excidi, ut cicatrix maior et latior fiat. Quod ubi incidit, linamenta super non fulcienda sed leviter tantum ponenda sunt, supraque ea, quae inflammationem repellant, id est ex aceto vel lana sucida vel spongia: cetera eadem, quae, ubi pus moveri debet, adhibenda sunt.

6 At cum infra incidi oportet, resupinato homine

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<sup>a</sup> The peritoneum.

<sup>b</sup> VII. 19. 9.

down, however, not all is to be removed: for at the base of the testicle there is an intimate connexion with the inner tunic, where excision is not possible without extreme danger; and so there it is to be left. The same is to be done if the inner tunic is the seat of the disease. But the cutting away cannot be done quite completely at the inguinal end of the wound, but only somewhat lower down, lest the abdominal membrane<sup>a</sup> be injured and set up inflammation. On the other hand too much of its upper part should not be left behind, lest subsequently there forms a pouch which continues to be the seat of the same malady. The testicle having been thus cleared is to be gently returned through the incision, along with the veins and arteries and its cord; and it must be seen that blood does not drop down into the scrotum, or a clot remain anywhere.<sup>b</sup> This will be accomplished if the surgeon takes the precaution of tying the blood vessels; the threads with which the ends of these are tied should hang out of the wound; following upon suppuration they will fall off painlessly. Through the margins of the wound itself two pins are then passed, and over this an agglutinating dressing. But it becomes necessary sometimes to cut away a little from one or other of the edges of the skin-incisions in order to make a broader and thicker scar. When this occurs the lint dressing must not be pressed on but must be applied lightly, and over it such things as repel inflammation, unscoured wool or sponge soaked in vinegar: all the other treatment is the same as when suppuratives have to be applied.

But when an incision is required lower down, then with the man on his back, the left hand is to

## CELSUS

subicienda sub scroto sinistra manus est; deinde id vehementer adprehendendum et incidendum. Si parvolum est, quod nocet, modice, ut tertia pars integra ad sustinendum testiculum infra relinquatur; si maius est, etiam amplius, ut paulum tantummodo ad imum, cui testiculus insidere possit, integrum maneat. Sed primo rectus scalpellus quam levissima manu teneri debet, donec scrotum ipsum diducat; tum inclinandus mucro est, ut transversa membrana secet, quae infra summam mediamque tunicam sunt.

7 Ac si vitium in proximo est, mediam tunicam attingi non oportet: si sub illa quoque conditur, etiam illa incidenda est, sicut tertia quoque, si illa vitium tegit. Ubicumque autem repertum est malum, ministrum ab inferiore parte exprimere moderate scrotum oportet; medicum digito manubriolove scalpelli deductam inferiore parte tunicam extra conlocare; deinde eam ferramento, quod a similitudine corvum vocant, incidere sic, ut intrare duo digiti, index et

8 medius, possint. His deinde . . .<sup>1</sup> coniectis, excipienda reliqua pars tunicae, et inter digitos scalpellus inmittendus est, eximendumque aut effundendum quicquid est noxium. Quamcumque autem tunicam quis violavit, illam quoque debet excidere; ac mediam quidem, ut supra (3) dixi, quam altissime ab inguine; imam autem paulum infra. Ceterum antequam excidantur, venae<sup>2</sup> quoque vinciri lino summae debent et eius lini capita extra plagam relin-

<sup>1</sup> *Marx supplies intus before coniectis.*

<sup>2</sup> *Reading venae (Krause) Marx keeps the MS. eae.*

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<sup>a</sup> ὄξυκόρακον σμιλίον (Paulus Aegineta, VI. 78) "raven's bill knife."

<sup>b</sup> See sections 3 and 5.

be passed under the scrotum; next this must be grasped firmly and the incision made. If the disease is small in extent, the incision is limited, so as to leave intact the lower third of the scrotum in order to support the testicle; if more extensive, the incision is prolonged so that just a little is left at the bottom to support the testicle. But the scalpel at first should be held in a very light hand, with its edge vertical to the skin, until the wall of the scrotum has been divided; then the edge is sloped sideways so as to cut across the membranes between the scrotal wall and the middle tunic. And if the disease is in the wall of the scrotum there is no need to touch the middle tunic; if it also lies under the middle tunic, this too has to be cut through, and the inner tunic as well if that covers the lesion. Now wherever the disease is found to be, the assistant should press the scrotum gently upwards; the surgeon either with his finger, or with the handle of the scalpel, separates the middle tunic from its connexion with the scrotal wall, and brings it forwards; then with a knife, called from its shape 'the raven,'<sup>a</sup> he lays it open so that his index and middle finger can enter. With these fingers so introduced the remainder of the tunic should be brought forwards, and the knife inserted in between the two fingers, and any diseased matter taken away or let out. If one of the tunics has been injured it also should be cut away; the middle one, as stated above, as far up as the groin; the inner one to a little below the groin. But before they are cut away, the blood vessels above too<sup>b</sup> should be ligatured with flax thread, the ends of which are to be left hanging out of the wound, as in the case of other

## CELSUS

- quenda sunt, sicut in aliis quoque [venis], quae id requisierint. Eo facto, testiculus intus reponendus est, oraeque scroti suturis inter se committendae, neque paucis, ne parum glutinentur et longior fiat curatio; neque multis, ne inflammationem augeant.
- 9 Atque hic quoque videndum est, ne quid in scroto sanguinis maneat. Tum inponenda glutinantia sunt. Si quando autem in scrotum sanguis defluxit aliquidve concretum ex eo descendit, incidi subter id debet, purgatoque eo spongia acri aceto madens circumdari. Deligatum autem vulnus omne, quod ex his causis factum est, si dolor nullus est, quinque primis diebus non est resolvendum, sed bis die tantum aceto inroranda lana vel spongia: si dolor est, tertia die resolvendum, et ubi fibulae sunt, eae incidendae; ubi linamentum, id inmutandum est rosaeque et vino madefaciendum id, quod inponitur.
- 10 Si inflammatio increscit, adiciendum prioribus cataplasma ex lenticula et melle vel malicorio, quod in austeri vino coctum sit, vel ex his mixtis. Si sub his inflammatio non conquieverit, post diem quintum multa calida aqua vulnus fovendum, donec scrotum ipsum et extenuetur et rugosius fiat; tunc inponendum cataplasma ex triticea farina, cui resina pinea adiecta sit; quae ipsa, si robustus cubat, ex
- 11 aceto; si tener, ex melle coquenda sunt. Neque dubium est, quodcumque inditum est, si magna inflammatio est, quin ea, quae pus movent, inponenda sint. Quod si pus in ipso scroto ortum est, paulum id incidi debet, ut exitus detur; linamen-
-

blood vessels that have had to be tied. This done, the testicle is to be replaced inside, and the scrotal margins united by stitches, not too few lest the edges fail to unite and the treatment is prolonged, and not too many lest they augment the inflammation. Here also it must be seen to that no blood remains in the scrotum.<sup>a</sup> Then agglutinants are put on. But if at any time blood trickles down into the scrotum, or any clot collects in it, an incision should be made below, and after clearing out the blood, a sponge soaked in strong vinegar is put on. Further, all such wounds made for the above reasons, after having been bandaged up, when there is no pain, should not be dressed until the fifth day, but the wool or sponge is to be saturated sufficiently with vinegar twice a day; if there is pain, the wound is to be freshly dressed on the third day, and when pins have been inserted they are then to be taken out; when lint has been used it must be changed and the fresh lint wetted with rose oil and wine. Should inflammation increase, to the previously mentioned applications add a plaster of lentils and honey or of pomegranate rind boiled in dry wine, or of the two combined. If the inflammation does not subside under these applications, after the fifth day the wound is to be fomented freely with hot water, until the scrotum itself both shrinks and becomes wrinkled; then apply a wheat flour plaster with pine resin added; which, for a robust patient has been boiled in vinegar, and for a delicate one in honey. Whatever the application used, there is no doubt that if there is much inflammation, suppuratives must be applied. But if pus collects in the scrotum itself, it must be let out through a small

tumque eatenus ponendum est, ut foramen tegat. Inflammatione finita, propter nervos priore cataplasmate, dein cerato utendum. Haec proprie ad eiusmodi vulnera pertinent. Cetera et in curatione et in victu similia is esse debent, quae in alio quoque vulnere genere praecepimus (V. 26. 25).

20. His propositis ad singulas species veniendum est. Ac si cui paulo puero intestinum descendit, ante scalpellum experienda vinctura est. Fascia eius rei causa fit, cui imo loco pila adsuta est ex panniculis facta, quae ad repellendum intestinum ipsi illi subicitur; deinde reliqua fasciae pars arte circumdatur; sub quo saepe et intus compellitur  
 2 intestinum et inter se tunicae glutinantur. Rursus si aetas processit, multumque intestini descendisse ex tumore magno patet, adiciunturque dolor et vomitus, quae stercore ex cruditate eo delapso fere accidunt, scalpellum adhiberi sine pernicie non posse manifestum est: levandum tantummodo malum et per alias curationes extrahendum est. Sanguis mitti ex brachio debet; deinde, si vires patiuntur, inperanda tridui abstinentia est; si minus, certe pro vi corporis quam longissima. Eo vero tempore super-  
 3 habendum cataplasma ex lini semine, quod ante aliquis ex mulso decoxerit. Post haec et farina hordiacia cum resina inicienda, et is demittendus in solium aquae calidae, cui oleum quoque adiectum sit; dandumque aliquid cibi lenis calidi. Quidam etiam alvum ducunt; id deducere aliquid in scrotum

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<sup>a</sup> The cords (deferent ducts of the testes) were called *πόροι* by Galen and *vasa deferentia* by later Latin writers: cf. p. 391, notes *b*, *c*.

<sup>b</sup> V. 26. 24-30.

incision ; and enough lint must be put on to cover the opening. When the inflammation is at an end, for the sake of the cords<sup>a</sup> first the plaster and then a cerate is to be used. Such is the proper treatment of wounds of this sort. For the rest as regards both treatment and diet, these should conform to what has been prescribed for other sorts of wounds.<sup>b</sup>

20. After this introduction, we come to particular conditions. And if in a young child intestine prolapses, bandaging should be tried before the knife. For this a strip of linen is taken, to one end of which is stitched a ball of rags which is placed on the prolapse itself so as to push back the intestines : then the rest of the strip of bandage is firmly tied all round ; under this the intestines are often forced inside and the tunics become agglutinated together. Again, if the patient is older, and the large size of the swelling shows that much of the intestines has come down, and if in addition there is pain and vomiting, which generally happens because faeces from undigested food have slipped down, then it is clearly impossible to employ the knife except harmfully ; the trouble can only be mitigated, and must be drawn out by other measures. Blood should be let from the arm, then if the patient's strength permits, fasting for three days should be prescribed, or else at least for as long as the strength allows. Meanwhile a plaster of linseed first boiled in honey wine is to be kept on over the hernia. Later one of barley meal with resin is to be applied, and the patient immersed in a bath of hot water to which olive oil also has been added ; after which some light warm food is to be given. Some also employ a clyster ; but that can only bring down something

## CELSUS

potest, educere ex eo non potest. Per ea vero, quae supra scripta sunt, levato malo, si quando alias dolor reverterit, eadem modo valere quae novimus  
4 erunt facienda. Sine dolore quoque si multa intestina prolapsa sunt, secari supervacuum est, non quo non excludi a scroto possint, nisi tamen inflammatio prohibuit, sed quo repulsa inguinibus inmorentur ibique tumorem excitent, atque ita fiat mali non finis sed mutatio. At in eo, quem scalpello curari oportebit, simul atque ad mediam tunicam vulnus in inguine factum pervenerit, duobus hamulis ea iuxta ipsas oras adprehendi debebit, cum deductis omnibus membranulis medicus eam liberet. Neque enim cum periculo laeditur, quae excidenda est, cum  
5 intestinum esse nisi sub ea non possit. Ubi deducta autem erit, ab inguine usque ad testiculum incidi debebit sic, ne is ipse laedatur; tum excidi. Fere tamen hanc curationem puerilis aetas et modicum malum recipit. Si vir robustus est maiusque id vitium est, extrahi testiculus non debet, sed in sua sede permanere. Id hoc modo fit. Inguen eadem ratione usque ad mediam tunicam scalpello aperitur, eaque tunica eodem modo duobus hamis excipitur sic, ut a ministro testiculus eatenus contineatur, ne per  
6 vulnus exeat; tum ea tunica deorsum versus scalpello inciditur, sub ea index digitus sinistrae manus ad imum testiculum demittitur, eumque ad plagam

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<sup>a</sup> VII. 19. 3, 4.

into the scrotum, and cannot evacuate anything from it. When by the measures just described, the disease has been mitigated, if at any time pain recurs, the same measures will have to be repeated which we have just found to be beneficial. If without causing any pain, a large amount of intestine has prolapsed, it is useless to operate; not that it is impossible to push back the intestines out of the scrotum, unless inflammation prevents it, but because as they are forced back they may become impacted in the groins and give rise to a swelling, so that the trouble is not ended but only changed in position. But in a case which is suitable for treatment by the knife, as soon as the incision made in the groin reaches the middle tunic, this must be seized near the margins by a couple of hooks, when, after drawing down all the fine membranes the surgeon sets it free. Nor is there any danger in wounding what has to be cut out, since the intestine must lie underneath it. When the middle tunic has been thus drawn down, it is slit open from the groin to the testicle, but so as not to injure the latter; then it is cut away.<sup>a</sup> Generally, however, this treatment is only admissible in boyhood and when the trouble is limited. For a robust man with a more extensive disorder the testicle should not be turned out, but kept in position. The procedure is as follows. The groin is laid open as before down to the middle tunic, and this tunic is seized as described above with two hooks, whilst the assistant keeps the testicle in its place, so that it does not come out of the wound; then the middle tunic is cut into with a scalpel towards its lower part, and through this opening the index finger of the left hand is passed beneath the testicle which

## CELSUS

compellit; deinde dextrae manus duo digiti, pollex atque index, venam et arteriam et nervum tuni-  
camque eorum a superiore tunica deducunt. Quod  
si aliquae membranulae prohibent, scalpello resol-  
vuntur, donec ante oculos tota iam tunica sit.  
Excisis, quae excidenda sunt, repositoque testiculo,  
ab ora quoque eius vulneris, quod in inguine est,  
demenda habenula paulo latior est, quo maior plaga  
sit et plus creare carnis possit.

21. 1. At si omentum descendit, eodem quidem  
modo quo supra (20. 4. 5. 19. 1. 2 *seqq.*) scriptum  
est, aperiendum inguen, deducendaeque tunicae  
sunt. Considerandum autem, maiorne is modus an  
exiguus sit. Nam quod parvulum est, super inguen  
in alvum vel digito vel averso specillo repellendum  
est; si plus est, sinere oportet dependere, quantum  
ex utero prolapsum est, idque adurentibus medica-  
B mentis inlinere, donec emoriatur et excidat. Quidam  
hic quoque duo lina acu traiciunt, binisque singu-  
lorum capitibus diversas partes adstringunt, sub quo  
acque sed tardius emoriatur. Adicitur tamen hic  
quoque celeritati, si omentum super vinculum linitur  
medicamentis, quae sic exedunt, ne erodant: septa  
C Graeci vocant. Fuerunt etiam qui omentum forfice  
praeciderent, quod in parvulo non est necessarium;  
si maius est, potest profusionem sanguinis facere,  
siquidem omentum quoque venis quibusdam etiam  
maioribus inligatum est. Neque vero si discusso

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<sup>a</sup> *i.e.* separate the tunica albuginea from the tunica vaginalis.

<sup>b</sup> See VII. 18. 1, notes.

<sup>c</sup> The exedents (for *septa*, cf. II. 41, note *a*) are milder than erodents and while eating away the diseased part their action does not spread so as to injure the surrounding tissues; certain essential oils were used as "antiseptics" (see *Medicamenta*,

is forced up into the wound; then the thumb and forefinger of the right hand separate the vein, the artery and cord, and their tunic<sup>a</sup> from the one above them. Any little membranes in the way are divided with a scalpel until now the entire tunic comes into view. After cutting away what has to be excised, and replacing the testicle, a rather broad strip is to be pared off from the edges of the wound in the groin, so that by making the wound broader it may form more flesh.

21. But if omentum comes down, the groin is to be cut into as described above, and the tunics<sup>b</sup> drawn down. Then it must be considered whether the mass is rather large or only small. For when quite small the omentum may be pushed back beyond the groin into the abdominal cavity, either with the finger, or with the opposite end of a probe; if the mass is larger what has prolapsed from the belly should be left hanging out of the wound, and smeared with caustic medicaments until it mortifies and falls off. In this condition too some transfix the tumour with a doubly threaded needle, and tie the two ends of each thread on opposite sides, under which treatment it mortifies, but more slowly. This may, however, be hastened by smearing the omentum beyond the ligature with medicaments which eat it away but do not erode; the Greeks call them *septa*.<sup>c</sup> Some have cut away the omentum with shears. If it is quite small, this is unnecessary; if larger, bleeding may follow, because the omentum itself is connected with blood vessels, some rather large. And although in the case of an abdominal wound, prolapsed omentum is cut away

s.v.) to counteract the effect of *σῆψις*, the eating away of tissue, when this was due to disease.

## CELSUS

ventre id prolapsum forfice praeciditur, cum et emortuum sit et aliter tutius avelli non possit, inde huc exemplum transferendum est. Vulnus autem curari, si reiectum omentum est, sutura debet; si amplius fuit et extra emortuum est, excisis oris, sicut supra (20. 6) positum est.

2 Si vero umor intus est, incidendum est in pueris quidem inguen, nisi in his quoque id liquoris eius maior modus prohibet; in viris vero et ubicumque multus umor subest, scrotum. Deinde si inguen incisum est, ea protractis tunicis umor effundi debet; si scrotum et sub hoc protinus vitium est, nihil aliud quam umor effundendus abscidendaeque membranae sunt, si quae eum continuerunt; deinde eluendum id ex aqua, quae vel salem adiectum vel nitrum habeat; si sub media imave tunica, totae eae extra scrotum conlocandae excidendaeque sunt.

22. Ramex autem, si super ipsum scrotum est, adurendus est tenuibus et acutis ferramentis, quae ipsis venis infigantur, cum eo ne amplius quam has urant; maximeque, ubi inter se implicatae glomerantur, eo ferrum id admovendum est. Tum super farina ex aqua frigida subacta inicienda est, utendumque eo vinculo, quod idoneum esse ani curationibus posui (VI. 18. 8 B). Tertio die lenticula cum melle inponenda est; post eiectis crustis ulcera melle purganda, rosa inplenda, ad cicatricem aridis linamentis perducenda sunt. Quibus vero super mediam tunicam venae tument, incidendum inguen

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<sup>a</sup> VII. 20. 6.

<sup>c</sup> VII. 18. 9, note *b*.

<sup>b</sup> VII. 18. 7, note *c*.

<sup>d</sup> VI. 18. 8 B.

with shears after it has mortified and there is no other safe way of removing it, no precedent can be drawn from that for this case. As to the treatment of the wound when the omentum has been replaced, it should be stitched; if the quantity was large, and has been left outside to mortify, the margins should be pared as described above.<sup>a</sup>

But if a hydrocele<sup>b</sup> occurs, in boys an incision is to be made in the groin, unless in their case too the large quantity of liquid prevents it; in men, and when there is a large amount of fluid, a scrotal incision is made. So then if the incision is in the groin, when the tunics have been drawn forwards the humour must then be evacuated there; if in the scrotum, and if the trouble is immediately beneath, there is nothing to do but to let out the fluid and cut away any membranes which are keeping it in; then the incision is washed with water to which salt or nitre has been added. If the fluid is under the middle tunic, or under the inner one, these tunics have to be brought out of the scrotal wound, and cut away.

22. Now a varix,<sup>c</sup> when in the scrotal skin, must be burnt with finely pointed cauteries, which penetrate into the veins themselves, but so that nothing deeper than the veins is burnt; the cautery is to be applied especially where the veins form a twisted mass. Then flour which has been steeped in cold water is put on and over this the bandage I have described as suitable after anal operations.<sup>d</sup> On the third day lentil meal with honey is applied: after the crusts have separated the ulcers are to be cleaned with honey, filled with rose oil, and cicatrized with dry lint. But when the veins overlying the middle tunic swell, the groin is to be

## CELSUS

est, atque tunica promenda; ab ea venae digito vel manubriolo scalpelli separandae. Qua parte vero inhaerent, et ab superiore et ab inferiore parte lino vinciendae; tunc sub ipsis vinculis praecidendae, reponendusque testiculus est. At ubi supra tertiam tunicam ramex insedit, mediam excidi necesse est; deinde, si duae tresve venae tument, et ita pars aliqua obsidetur, ut maior eo vitio vacet, idem faciendum, quod supra (19. 3) scriptum est, ut et ab inguine et ab testiculo deligatae venae praecidantur, 3 isque condatur. Sin totum id ramex obsederit, per plagam demittendus digitus index erit, subiciendusque venis sic, ut paulatim eas protrahat, eaeque adducendae, donec is testiculus par alteri fiat. Tum fibulae oris sic iniciendae, ut simul eas quoque venas comprehendant. Id hoc modo fit: acus ab exteriori parte oram vulneris perforat; tum non per ipsam venam sed per membranam eius emittitur per eamque in alteram oram compellitur. Vena vulne- 4 rari non debet, ne sanguinem fundat. Membrana semper inter has venas est, ac neque periculum adfert, et filo comprehensa illas abunde tenet. Itaque etiam satis est duas fibulas esse. Tum venae, quaecumque protractae sunt, in ipsum inguen averso specillo compelli debent. Solvendi fibulas

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<sup>a</sup> The pins were fixed by a thread twisted round them in a figure of 8. Vol. II. Introduction, p. lxi, *fibula*.

incised and the tunic pressed out into the wound; from it the veins are separated by a finger or the handle of the scalpel. But at the part where they are still attached, the veins are to be tied with linen thread both above and below that part; then cut away just beyond the ligatures and the testicle replaced. But when the varix is situated upon the inner tunic, it is necessary to cut through the middle tunic; then, if but two or three veins are swollen and some part only is involved, so that most of it is still free of the disease, the same is to be done as described above, so that the veins after being ligatured on the side of the groin and testicle respectively are cut away, after which the testicle is replaced. But if the varix involves the whole of one testis, the index finger is to be passed into the wound and under the veins, so as to draw them gradually forward, and they must be brought up until the testicle of that side is level with the opposite one. Then pins are passed through the edges so that at the same time they take up the veins as well. It is done in this way: the pin perforates from without through one edge of the wound, then it is passed not through an actual vein but through its membrane, and is pushed out through this to the opposite margin of the incision. A vein should not be wounded lest it bleed. There is always a membrane between these veins, and no danger is involved, and when the pin<sup>a</sup> has been fixed by a thread it holds the veins fast enough. Hence two pins are enough. Then whatever veins have been drawn forwards should be pushed back within the inguinal wound by the reverse end of the specillum. The time to take out the pins is when the inflammation

## CELSUS

tempus inflammatione finita et purgato vulnere est, ut una simul et oras et venas cicatrix devinciatur.

5 Ubi vero inter imam tunicam et ipsum testiculum nervumque eius ramex est ortus, una curatio est, quae totum testiculum abscidit. Nam neque ad generationem quicquam is confert, et omnibus indecore, quibusdam etiam cum dolore dependet. Sed tum quoque inguen incidendum, media tunica promenda atque excidenda est; idem imae faciendum; nervus, ex quo testiculus dependet, praecidendus. Post id venae et arteriae ad inguen lino deligandae et infra vinculum abscidendae sunt.

23. Caro quoque, si quando inter tunicas concrevit, nihil dubi est, quin eximenda sit; sed id ipso scroto inciso fieri commodius est. At si nervus induruit, curari res neque manu neque medicamento potest. Urgent enim febres ardentes et aut virides aut nigri vomitus; praeter haec ingens sitis et linguae aspritudo; fereque a die tertio spumans bilis alvo cum rosione redditur. At neque adsumi facile cibus neque contineri potest, neque multo post extremae partes frigescunt, tremor oritur, manus sine ratione extenduntur; deinde in fronte frigidus sudor, eumque mors sequitur.

24. Ubi vero in ipso inguine ramex est, si tumor modicus est, semel incidi, si maior, duabus lineis debet, ut medium excidatur; deinde non extracto testiculo, sicut intestinis quoque prolapsis

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\* See p. 391, note *b* and p. 408, note *a*.

has ceased and the wound has cleaned, so that one and the same scar may bind together simultaneously both the margins of the incision and the veins. But if a varix has developed between the inner tunic and the testicle itself and its cord, there is but one method of treatment, to excise the testicle entirely. For it is now useless for generation, and always hangs down in an ugly way, while it is sometimes painful as well. But in this case also the groin is to be cut into, the middle tunic pressed out and cut away, and the inner tunic likewise. Then the cord by which the testicle is suspended<sup>a</sup> is to be cut through. After this the veins and arteries towards the groin are to be ligatured with linen thread, and cut away below the ligature.

23. Flesh also, if it ever grows between the tunics, must certainly be cut out; but it is better to make an incision through the scrotum itself. But if the cord has become indurated, the condition cannot be cured either by surgery, or by medicaments. For burning fevers and green or black vomit oppress the patients, and besides these great thirst and roughness of the tongue; and generally from the third day frothy bile is passed in a smarting motion. But the patient cannot readily either take food, or retain it; not long after the extremities grow cold, tremor arises, the hands are outstretched involuntarily; then a cold sweating on the forehead is followed by death.

24. But when there is a varix actually situated in the inguinal region, if it forms a moderate swelling, a linear incision is made, if larger two incisions, and the included skin excised. Then without drawing out the testicle, as I directed to be done for cases

## CELSUS

interdum fieri docui (20. 5), colligendae venae vinciendaeque, ubi tunicis inhaerebunt, et sub his praecidendae sunt. Neque quicquam novi curatio vulneris eius requirit.

25. 1. Ab his ad ea transeundum est, quae in cole ipso fiunt. In quo si glans nuda est, vultque aliquis eam decoris causa tegere, fieri potest; sed expeditius in puero quam in viro; in eo, cui id naturale est, quam in eo, qui quarundam gentium more circumcisis est; in eo, cui glans parva, iuxtaque eam cutis spatiosior, brevior vero ipse coles  
B est, quam in quo contraria his sunt. Curatio autem eorum, quibus id naturale est, eiusmodi est. Cutis circa glandemprehenditur et extenditur, donec illam ipsam condat, ibique deligatur. Deinde iuxta pubem in orbem tergitur inciditur, donec coles nudetur, magnaue cura cavetur, ne vel urinae iter vel venae, quae ibi sunt, incidantur. Eo facto, cutis ad vinculum inclinatur, nudaturque circa pubem velut circulus; eoque linamenta dantur, ut caro increseat et id impleat. . . .<sup>1</sup> satisque velamenti supra latitudo plagae praestat. Sed donec cicatrix sit, vinctum  
C itinere. At in eo, qui circumcisis est, sub circulo glandis scalpello deducenda cutis ab interiore colest.

<sup>1</sup> *Marx would add after impleat "satis magnam partem colis nudatum esse intelligitur si cutis aut nihil aut paulum intenta est," and this is translated.*

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<sup>a</sup> VII. 20. 5.

<sup>b</sup> The treatment is first referred to in I *Maccabees* i. 14, 15. "Wherefore they built a place of exercise at Jerusalem according to the custom of the heathen and made themselves uncircumcised."

of prolapse of the intestines,<sup>a</sup> the veins are to be taken up, and ligatured where they are attached to the tunics, then cut away below the ligature knots. The treatment of the wound presents nothing novel.

25. From the above we pass to operations on the penis itself. And, if the glans is bare and the man wishes for the look of the thing to have it covered, that can be done; but more easily in a boy than in a man; in one in whom the defect is natural, than in one who after the custom of certain races has been circumcised; and in one who has the glans small and the adjacent skin rather ample, while the penis itself is shorter, rather than in one in whom the conditions are contrary.

Now the treatment for those in whom the defect is natural is as follows. The prepuce around the glans is seized, stretched out until it actually covers the glans, and there tied. Next the skin covering the penis just in front of the pubes is cut through in a circle until the penis is bared, but great care is taken not to cut into the urethra, nor into the blood vessels there. This done the prepuce slides forwards towards the tie, and a sort of small ring is laid bare in front of the pubes, to which lint is applied in order that flesh may grow and fill it up. <It is seen that a large enough part of the penis has been bared, if the skin is distended little or not at all, and if> the breadth of the wound above supplies sufficient covering. But until the scar has formed it must remain tied, only a small passage being left in the middle for the urine. But in one who has been circumcised<sup>b</sup> the prepuce is to be raised from the underlying penis around the circumference of the glans by means of a scalpel. This is not so

## CELSUS

Non ita dolet, quia summo soluto deduci deorsum usque ad pubem manu potest; neque ideo sanguis profluet. Resoluta autem cutis rursus extenditur ultra glandem; tum multa frigida aqua fovetur, emplastrumque circa datur, quod valentem inflammationem reprimat. Proximisque diebus ei prope a fame victus sit, ne forte eam partem satietas excitet. Ubi iam sine inflammatione est, deligari debet a pube usque circulum; super glandem autem averso . . .<sup>1</sup> emplastro inposito induci. Sic enim fit, ut inferior pars glutinetur, superior ita sanescat, ne inhaereat.

2 Contra si glans ita contacta est, ut nudari non possit, quod vitium Graeci phimosin appellant, aperienda est; quod hoc modo fit: subter a summa ora cutis inciditur recta linea usque ad frenum, atque ita superius tergus relaxatum cedere retro potest. Quod si parum sic profectum est, aut propter angustias aut propter duritiem tergoris, protinus triangula forma cutis ab inferiore parte excidenda est sic, ut vertex eius ad frenum, basis in terгоре extremo sit. Tum superdanda linamenta sunt aliaque medicamenta, quae ad sanitatem perducant. Necessarium autem est, donec cicatrix sit, conquiescere: nam ambulatio adterendo ulcus sordidum reddit.

Infibulare quoque adolescentulos, interdum vocis, interdum valetudinis causa, quidam consueverunt; eius haec ratio est: cutis, quae super glandem est,

<sup>1</sup> *Marx inserts specillo, and suggests that the name of the plaster has fallen out.*

\* V. 28. 3 D and VI. 18. 2 A.

<sup>b</sup> *i.e.* between the pubes and the corona.

<sup>c</sup> Covering the glans.

<sup>d</sup> II. 268, note a

very painful, for once the margin has been freed, it can be stripped up by hand as far back as the pubes, nor in so doing is there any bleeding. The prepuce thus freed is again stretched forwards beyond the glans; next cold water affusions are freely used, and a plaster<sup>a</sup> is applied round to repress severe inflammation. And for the following days the patient is to fast until nearly overcome by hunger lest satiety excite that part. When the inflammation has ceased, the penis should be bandaged from the pubes to the corona; over the glans the plaster is applied with the other end of the probe. This is done in order that the lower part<sup>b</sup> may agglutinate, whilst the upper part<sup>c</sup> heals without adhering.

On the other hand, if the glans has become so covered that it cannot be bared, a lesion which the Greeks call phimosi<sup>d</sup>, it must be opened out, which is done as follows: underneath the foreskin is to be divided from its free margin in a straight line back as far as the frenum, and thus the skin above is relaxed and can be retracted. But if this is not successful, either on account of constriction or of hardness of the skin, a triangular piece of the foreskin is cut out from underneath, having its apex at the frenum, and its base at the edge of the prepuce. Then lint dressing and other medicaments to induce healing are put on. But it is necessary that the patient should lie up until the wound heals, for walking rubs the wound and makes it foul.

Some have been accustomed to pin up the prepuce in adolescents either for the sake of the voice, or for health's sake. This is the method: the foreskin covering the glans is stretched forwards and

## CELSUS

extenditur, notaturque utrimque a lateribus atramento qua perforetur; deinde remittitur. Si super glandem notae revertuntur, nimis adprehensum est et ultra notari debet; si glans ab iis libera est, is locus idoneus fibulae est. Tum qua notae sunt, cutis acu filum ducente transuitur, eiusque fili capita inter se deligantur, cotidieque id movetur, donec circa foramina cicatriculae fiant. Ubi eae confirmatae sunt, exempto filo fibula additur; quae quo levior, eo melior est. Sed hoc quidem saepius inter supervacua quam inter necessaria est.

26. 1. Res vero interdum cogit emoliri manu urinam, cum illa non redditur, aut quia senectute iter eius conlapsum est, aut quia calculus vel concretum aliquid ex sanguine intus se opposuit; at mediocris quoque inflammatio saepe eam reddi naturaliter prohibet: idque non in viris tantummodo sed in feminis quoque interdum necessarium est. Ergo aeneae fistulae fiunt, quae ut omni corpori, ampliori minorique, sufficiant, ad mares tres, ad feminas duae medico habendae sunt: ex virilibus maxima decem et quinque est digitorum, media duodecim, minima novem: ex muliebribus maior **B** novem, minor sex. Incurvas vero esse eas paulum, sed magis viriles oportet, levisque admodum ac neque nimis plenas neque nimis tenues. Homo tum resupinus eo modo, quo in curatione ani figuratur, super subsellium aut lectum conlocandus est. Medicus autem a dextro latere sinistra quidem manu

the point for perforation marked on each side with ink. Then the foreskin is let go. If the marks are drawn back over the glans too much has been included, and the marks should be placed further forward. If the glans is clear of them, their position is suitable for the pinning. Then the foreskin is transfixed at the marks by a threaded needle, and the ends of this thread are knotted together. Each day the thread is moved until the edges of the perforations have cicatrized. When this is assured the thread is withdrawn and a fibula inserted, and the lighter this is the better. But this operation is more often superfluous than necessary.

26. Sometimes we are compelled to draw off the urine by hand when it is not passed naturally; either because in an old man the passage has collapsed, or because a stone, or a blood-clot of some sort has formed an obstruction within it; but even a slight inflammation often prevents natural evacuation; and this treatment is needed not only for men but sometimes also for women. For this purpose bronze tubes are made, and the surgeon must have three ready for males and two for females, in order that they may be suitable for every body, large and small: those for males should be the longest, fifteen finger-breadths in length, the medium twelve, the shortest nine; for females, the longer nine, the shorter six. They ought to be a little curved, but more so for men, and they should be very smooth and neither too large nor too small. Then the man must be placed on his back, in the way described for anal treatment, on a low seat or couch; while the practitioner stands on his right side, and taking the

## CELSUS

colem masculi continere, dextra vero fistulam demittere in iter urinae debet; atque ubi ad cervicem vesicae ventum est, simul cum cole fistulam inclinatam in ipsam vesicam compellere, eamque urina reddita recipere. Femina brevius urinae iter et rectius habet, quod mammulae simile inter imas oras super naturale positum non minus saepe auxilio eget, aliquanto minus difficultatis exhibet. Nonnumquam etiam prolapsus in ipsam fistulam calculus, quia subinde ea extenuatur, non longe ab exitu inhaerescit. Eum, si fieri potest, oportet evellere vel oriculario specillo vel eo ferramento, quo in sectione calculus protrahitur. Si id fieri non potuit, cutis extrema quam plurimum adtrahenda et condita glande lino vincienda est; deinde a latere recta plaga coles incidendus, et calculus eximendus est, tum cutis remittenda. Sic enim fit, ut incisum colem integra pars cutis contegat, et urina naturaliter profluat.

2 Cum vesicae vero calculique facta mentio sit, locus ipse exigere videtur, ut subiciam, quae curatio calculosis, cum aliter succurri non potest, adhibeatur: ad quam festinare cum praeceps sit, nullo modo convenit. Ac neque omni tempore neque in omni aetate neque in omni vitio id experiendum est, sed solo vere, in eo corpore, quod iam novem annos, nondum quattuordecim excessit, et si tantum mali est, ut neque medicamentis vinci possit, neque iam

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<sup>a</sup> 2 K below.

<sup>b</sup> Stone was evidently common among schoolboys then as it continued to be in this country up to within living memory. There was a sudden change from great frequency to rarity, corresponding to the change from drinking small beer (which included an infusion of the bitter constituent of hops) to the universal adoption of tea (which has a diuretic property).

penis of the male patient in his left hand, with his right hand passes the pipe into the urethra; and when it has reached the neck of the bladder, the pipe together with the penis is inclined and pushed on right into the bladder; and when the urine has been evacuated, it is taken out again. The woman's urethra is both shorter and straighter, like a nipple placed between the inner labia over the vagina, and this requires assistance no less often though it is attended by somewhat less difficulty. Sometimes too a stone slips into the urethra itself, and lodges not far from its orifice, because this becomes narrower further down. The stone should if possible be extracted either by an earscoop or by the instrument<sup>a</sup> with which a stone is drawn out in the course of lithotomy. If this cannot be done, the foreskin is drawn as far forwards as possible over the glans and tied there by a thread. Then to one side of the penis a longitudinal incision is to be made and the stone taken out, after which the prepuce is released. This is done in this way so that an intact portion of skin covers the incision into the penis, and urine flows out naturally.

Now that mention has been made of the bladder and of stone, this seems the proper place to describe what treatment is to be adopted in cases of calculus, when it is impossible otherwise to afford relief; but it is most inadvisable to undertake it hastily, since it is very dangerous. This operation is not suitable for every season or at any age or for every lesion, but it must be used in the spring alone, in a boy<sup>b</sup> who is not less than nine years of age and not more than fourteen, and if the disease is so bad that it cannot be relieved by medicaments, or

## CELSUS

trahi posse videatur, quo minus interposito aliquo  
B spatio interemat. Non quo non interdum etiam  
temeraria medicina proficiat, sed quo saepius utique  
in hoc fallat, in quo plura et genera et tempora  
periculi sunt; quae simul cum ipsa curatione pro-  
ponam. Igitur, ubi ultima experiri statutum est,  
ante aliquot diebus victu corpus praeparandum est,  
ut modicos, ut salubres cibos, ut minime glutinosos  
adsumat; ut aquam bibat. Ambulandi vero inter  
hacc exercitatione utatur, quo magis calculus ad  
C vesicae cervicem descendat. Quod an inciderit,  
digitis quoque, sicut in curatione (E) docebo, de-  
missis cognoscitur. Ubi eius rei fides est, pridie is  
puer in ieiunio continendus, et tum loco calido  
curatio adhibenda; quae hoc modo ordinatur: homo  
praevalens et peritus in sedili alto considit; supi-  
numque eum et aversum, super genua sua coxis eius  
conlocatis, comprehendit; reductisque eius cruribus  
ipsum quoque iubet, manibus ad suos poplites datis,  
eos quam maxime possit adtrahere, simulque ipse  
D sic eos continet. Quod si robustius corpus eius est,  
qui curatur, duobus sedilibus iunctis duo valentes  
insidunt, quorum et sedilia et interiora crura inter  
se deligantur, ne diduci possint. Tum is super  
duorum genua eodem modo collocatur; atque alter,  
prout consedit, sinistrum crus eius, alter dextrum,

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<sup>4</sup> Prooemium 49 and III. 9. 4, 5 (vol. I, 26. 270).

endured by the patient without shortly bringing his life to a close. Sometimes even a rash line of treatment is successful, but it generally disappoints, especially in this sort of case, where the types and seasons of danger are very numerous, and these I will describe along with the treatment itself.<sup>a</sup> Therefore when it has been decided to make trial of this last resource, for some days beforehand the patient's body is to be prepared by dieting, so that he takes a moderate amount of food which is wholesome, and not glutinous, and drinks water. Meanwhile he should also take walking exercise to encourage the stone to descend to the neck of the bladder. Whether this has happened is recognized by the insertion of the finger, as I shall point out in the course of the treatment. When that is assured and the boy has been kept fasting from the previous day, then the operation is carried out in a warm room, and in the following manner. A strong and well-trained man, seated on a high stool, seizes the boy from behind and draws him backwards until his buttocks rest on the man's knees. When the boy's legs have been drawn up, the man orders him to put his hands behind his knees, and to pull upon them as much as he can, and at the same time the man keeps them in this position. But if a stronger person is to be treated, two strong men are seated on stools, side by side, and both the stools and the adjacent legs of the men are lashed together, so that they cannot be separated. Then the patient is seated in the same way as above upon the knees of the two men; and according to their position, one man takes hold of the patient's left leg, the other of the right, whilst at the same

## CELSUS

simulque ipse poplites suos adtrahit. Sive autem unus, sive duo continent, super umeros eius suis E pectoribus incumbunt. Ex quibus evenit, ut inter ilia sinus super pubem sine ullis rugis sit extentus et in angustum compulsa vesica ex facili calculus capi possit. Praeter haec etiamnum a lateribus duo valentes obiciantur, qui circumstantes labare vel unum vel duos, qui puerum continent, non sinunt. Medicus deinde, diligenter unguibus circumcisis, unctaque sinistra manu duos eius digitos, indicem et medium, leniter prius unum, deinde alterum in anum eius demittit; dextraeque digitos super anum abdomen leviter inponit, ne, si utrimque digiti circa calculum vehementer concurrerint, vesicam laedant. F Neque vero festinanter in hac re, ut in plerisque, agendum est, sed ita, ut quam maxime id tuto fiat: nam laesa vesica nervorum distensiones cum periculo mortis excitat. Ac primum circa cervicem quaeritur calculus, ubi repertus minore negotio expellitur. Et ideo dixi ne curandum quidem, nisi cum hoc G indiciis suis cognitum est. Si vero aut ibi non fuit aut recessit retro, digiti ad ultimam vesicam dantur, paulatimque dextra quoque manus eius ultra translata subsequitur. Atque ubi repertus calculus, qui necesse est in manus incidat, eo curiosius deducitur, quo minor leviorque est, ne effugiat. [id est

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<sup>a</sup> Cf. 2 C, D and N, where the symptoms are described which occur when the stone is situated in this position, *i.e.* at the neck of the bladder.

<sup>b</sup> *i.e.* of the surgeon's left hand.

time the patient pulls upon his own hams. Whether one or two men hold the patient, they press downwards with their chests upon the patient's shoulders. Hence it results that the hollow between the iliac regions above the pubes is outstretched without any folds, and as the bladder is crammed into a narrow space the calculus can easily be seized hold of. In addition, moreover, two strong men should be put to stand at the sides, and they by standing there prevent the man or men who are holding the boy from slipping. Then the surgeon having carefully pared his nails and anointed his left hand, gently introduces two fingers, the index and the middle, first one and then the other, into the anus; next he places the fingers of his right hand upon the hypogastrium, but lightly, lest if the two sets of fingers should press around the calculus with any force, the bladder may be injured. And in this procedure we must not act with haste, as in most cases, but so that safety is the first consideration; for an injury to the bladder causes spasm with danger of death. And the stone is first sought for about the neck of the bladder; when found there it is expelled with less trouble. And this is why I said there should be no operation except when the stone has been recognized by its special signs.<sup>a</sup> But if the stone is not found at the neck of the bladder, or if it has slipped backwards, the fingers<sup>b</sup> are placed against the base of the bladder. while the surgeon's right hand too is placed above the stone and gradually follows it downwards. When the stone has been found, and it must fall between his hands, it is guided downwards with special care the smaller and the smoother it is, lest it escape. [This is that the bladder may not

## CELSUS

ne saepius agitanda vesica sit.] Ergo ultra calculum dextra semper manus eius se opponit, sinistrae digiti deorsum eum compellunt, donec ad cervicem pervenitur: in quam, si oblongus est, sic compellendus est, ut pronus exeat; si planus, sic ut transversus sit; si quadratus, ut duobus angulis sedeat; si altera parte plenior, sic ut prius ea, qua tenuior sit, evadat.

H In rotundo nihil interesse ex ipsa figura patet, nisi si levior altera parte est, ut ea antecedit. Cum iam eo venit, tum incidi super vesicae cervicem iuxta anum cutis plaga lunata usque ad cervicem vesicae debet, cornibus ad coxas spectantibus: paulum deinde infra ea parte, qua resima plaga est, etiamnum sub cute altera transversa plaga facienda est, qua cervix aperiatur, donec urinae iter pateat sic, I ut plaga paulo maior quam calculus sit. Nam qui metu fistulae, quam illo loco rhyada Graeci vocant, parum patefaciunt, maiore eodem periculo revolvuntur, quia calculus iter, cum vi promitur, facit, nisi accipit; idque etiam perniciosius est, si figura quoque calculi vel aspritudo aliquid eo contulit. Ex quo et sanguinis profusio et distentio nervorum fieri potest. Quae si quis evasit, multo tamen patientiorem fistulam habiturus est rupta cervice, quam habuisset incisa. Cum vero ea patefacta est, in conspectum calculus venit; in cuius colore nullum discrimen est.

K Ipse si exiguus est, digitis ab altera parte propelli,

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\* VII. 7. 4 C, note.

be too often disturbed.] Therefore the right hand of the surgeon is always kept above the stone whilst the fingers of the left press it downwards until it arrives at the neck of the bladder: and it must be pressed towards this so that if oblong, it comes out end on; if flat it lies crossways; if cubical, it rests on two of its angles; if any part is larger, the smaller part comes out first. In the case of a spherical stone, it is clear that the shape makes no difference, except that if any part is the smoother this should be in front. When the stone has now got there, then the skin over the neck of the bladder next the anus should be incised by a semilunar cut, the horns of which point towards the hips; then a little lower down in that part of the incision which is concave, a second cut is to be made under the skin, at a right angle to the first, to open up the neck of the bladder until the urinary passage is opened so that the wound is a little larger than the stone. For those who make a small opening for fear of a fistula, which in this situation the Greeks call *rhyas*,<sup>a</sup> incur this same danger to a greater degree, because the stone, when it is pressed down with force, makes a way out for itself unless it is given one. And this is even more harmful if the shape of the stone or its roughness has caused any additional trouble. As a consequence bleeding and spasm may be set up. And even if the patient survives he will have, nevertheless, a much wider fistula if the neck of the bladder has been torn, than he would have had if it had been cut. Now when the urethra has been laid open, the stone comes into view; its colour is of no importance. If it is small, it can be pushed outwards with the fingers

## CELSUS

ab altera protrahi potest. Si maior, iniciendus a superiore ei parte uncus est eius rei causa factus. Is est ad extremum tenuis, in semicirculi speciem retusae latitudinis, ab exteriori parte levis, qua corpori iungitur, ab interiori asper, qua calculum adtingit isque longior potius esse debet: nam brevis extrahendi vim non habet. Ubi iniectus est, in utrumque latus inclinandus est, ut appareat calculus si teneatur; quia, si adprehensus est, ille simul L inclinatur. Idque eo nomine opus est, ne, cum adduci uncus coeperit, calculus intus effugiat, hic in oram vulneris incidat eamque convulneret: in qua re quod periculum esset, iam supra (F) posui. Ubi satis teneri calculum patet, eodem paene momento triplex motus adhibendus est: in utrumque latus, deinde extra, sic tamen id leniter ut fiat paulumque primo calculus adtrahatur. Quo facto, attollendus uncus extremus est, uti intus magis maneat faciliusque illum producat. Quod si quando a superiore parte calculus parum commode comprehendetur, a latere erit adprehendendus. Haec est simplicissima M curatio. Sed varietas rerum quasdam etiamnum animadversiones desiderat. Sunt enim quidam non asperi tantummodo sed spinossi quoque calculi, qui per se quidem delapsi in cervicem sine ullo periculo eximuntur. In vesica vero non tuto vel hi conquiruntur vel adtrahuntur, quoniam ubi illam convulnerarunt, ex distentione nervorum mortem matu-

on one side, and extracted by those on the other. If large, we must put over the upper part of it the scoop made for the purpose. This is thin at the end, beaten out into a semicircular shape, smooth on the outer side, where it comes into contact with the body, rough on the inner where it touches the stone. The scoop must be rather long, for a short one has not the strength to extract. When the scoop has been put in, it should be moved to each side to see whether the stone is held, because if it has been well grasped, it is moved with the scoop. This is required lest when the scoop begins to be drawn forward, the stone should slip inwards and the scoop cut into and lacerate the wound opening, and I have noted above how dangerous this is. When it is certain that the stone is sufficiently held, almost simultaneously a triple movement is to be made; first towards each side, then outwards, this in such a way that the movement is gentle and the stone is at first drawn outwards but little; this done the one end is to be raised so that the scoop may stay further in, and more easily draw out the stone. But if at any time the stone cannot be properly caught from above, it will have to be taken hold of from one side. This is the simplest method of operation. But various contingencies call for some further observations. There are some stones which are not merely rough but also spinous, which if they have come down to the neck of the bladder of their own accord may be extracted without any danger. But it is not safe to search for these within the bladder and draw them out, for when they have wounded the bladder they cause a speedy death from spasm, and much more

## CELSUS

rant; multoque magis, si spina aliqua vesicae in-  
N haeret eamque, cum duceretur, duplicavit. Colli-  
gitur autem eo, quod difficiliter urina redditur, in  
cervice calculum esse; eo, quod cruenta destillat,  
eum esse spinosum; maximeque sub his digitis  
quoque experiendum est, neque adhibenda manus,  
nisi id constitit. Ac tum quoque leniter intus digiti  
obiciendi, ne valenter promovendo convolnerent;  
tum incidendum. Multi hic quoque scalpello usi  
sunt. Meges quoniam is infirmior est potestque in  
aliqua prominentia incidere, inciso[que] super illa  
corpore qua cavum subest, non secare, sed relinquere  
quod iterum incidi necesse sit, ferramentum fecit  
rectum, in summa parte labrosum, in ima semicircu-  
O latum acutumque. Id receptum inter duos digitos,  
indicem ac medium, super pollice inposito, sic de-  
primebat, ut simul cum carne, si quid ex calculo  
prominebat, incideret. Quo consequabatur, ut semel  
quantum satis esset, aperiret. Quocumque autem  
modo cervix patefacta est, leniter extrahi quod  
asperum est debet, nulla propter festinationem vi  
admota.

3 At calculus harenosus et ante manifestus est,  
quoniam eo urina quoque redditur harenosa, et in  
ipsa curatione, quoniam inter subiectos digitos neque  
aeque remittitur et insuper dilabitur. Item molles  
calculos et ex pluribus minutisque sed inter se parum  
adstrictis compositos indicat urina trahens quasdam

so if a spinous stone sticks to the bladder, and when being drawn down has folded it over. Now it may be inferred that the stone is at the neck of the bladder, when the patient has difficulty in passing water: or that the stone is spinous, when he passes bloody urine in drops. And it is most important that the calculus should be felt under the fingers, and that the operation should not be proceeded with unless this is assured. And then too the fingers must be applied gently, lest they wound by pressing forcibly: the incision is then made. Many use a scalpel here also. Since this is rather weak, and may meet some projecting part of the stone, and while cutting the flesh over the projection fail to divide what is in the hollow beneath, but leave something which necessitates a second operation. Meges made a straight blade, with a wide border on its upper part, semicircular and sharp below. This knife, with its handle grasped between the two fingers, index and middle, and the thumb put upon the back of the blade, was so pressed down that any projection upon the stone might be cut through along with the flesh. By this means it followed that he made one opening of a sufficient size. But in whatever way the neck of the bladder is laid open, any rough stone should be extracted gently, and no force used to hasten matters.

A sandy stone is made evident before the operation by the sandy urine which is passed, and in the course of it, since it does not present a uniform resistance to the fingers in the rectum, and in addition it breaks up. Again soft stones and those composed of numerous small ones which only lightly adhere together, are indicated when the urine

## CELSUS

quasi squamulas. Hos omnes leniter permutatis subinde digitorum vicibus sic oportet adducere, ne vesicam laedant neve intus aliquae dissipatae reliquiae maneant, quae postmodo curationi difficultatem B faciant. Quicquid autem ex his in conspectum venit, vel digitis vel unco eximendum est. Ac si plures calculi sunt, singuli protrahi debent, sic tamen ut, si quis exiguus supererit, potius relinquatur. Siquidem in vesica difficulter invenitur, inventusque celeriter effugit. Ita longa inquisitione vesica laeditur, excitatque inflammationes mortiferas, adeo ut quidam non secti, cum diu frustra per digitos vesica esset agitata, decesserint. Quibus accedit etiam, quod exiguus calculus ad plagam urina postea promovetur et excidit. Si quando autem is [maior] non videtur nisi rupta cervice extrahi posse, findendus est: cuius repertor Hammonius ob id lithotomos cognominatus est. Id hoc modo fit: uncus inicitur calculo sic, ut facile eum concussum quoque teneat, ne is retro revolvatur; tum ferramentum adhibetur crassitudinis modicae, prima parte tenui sed retusa; quod admotum calculo ex altera parte ictu eum findit, magna cura habita, ne aut ad ipsam vesicam ferramentum perveniat, aut calculi fractura ne quid incidat.

4 Hae vero curationes in feminis quoque similes sunt, de quibus tamen [parum] proprie quaedam

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\* "The stone cutter." Cf. Book VII. Prooemium 3. The words *λιθοτομία* (*λιθοτόμος*) primarily used of stone quarrying became from the 3rd century B.C. onwards technical terms in connection with the operation which Celsus describes, and were still so used nearly a thousand years later (cf. Paulus Aegineta, VI. 60).

shows scalelike particles. All these should be brought out gently by changing as before the position of the fingers in turn, without injury to the bladder, yet so as not to leave behind in it any scattered remnants which will render the after-treatment difficult. When anything of this kind comes into view it is to be extracted by the fingers or scoop. And if there are several stones they are to be extracted one by one, but if a very small stone remains over it had better be left. For it is difficult to find it in the bladder, or when found it easily escapes again. In such a prolonged search the bladder is injured and fatal inflammations set up; so that some who have not been operated on have died after the bladder has been for a long while and in vain pushed about by the fingers. There is the additional reason that a small stone is later moved forward with the urine into the wound and so removed. If, however, at any time the stone appears too large to extract without tearing the neck of the bladder, it is to be split up; hence Ammonius the inventor of this process was surnamed lithotomus.<sup>a</sup> This is done as follows: the scoop is passed over the stone, so that it easily keeps hold of the stone, even when it is struck; next an instrument is used of moderate thickness, its front end tapering yet blunt, and when this is put against the calculus, and its other end struck, it splits up the stone, great care being taken that the instrument does not come into contact with the bladder itself, and that no fragment from the broken calculus cuts into it.

Now these operations are similar in females too, yet there are some particulars to be mentioned

## CELSUS

dicenda sunt. Siquidem in his, ubi parvulus calculus est, scalpellus supervacuus est, quia is urina in cervicem compellitur, quae et † in<sup>1</sup> brevior quam in maribus et laxior est. Ergo et per se saepe excidit, et si in primo, quod est angustius, inhaeret, eodem tamen unco sine ulla noxa educitur. At in maioribus calculis necessaria eadem curatio est. Sed virgini subire digiti qua masculo, mulieri per naturale eius debent. Tum virgini quidem sub ima sinisteriore ora, mulieri vero inter urinae iter et os pubis incidendum est sic, ut utroque loco plaga ista transversa sit; neque terreri convenit, si plus ex muliebri corpore sanguinis profluit.

- 5 Calculo evolso, si valens corpus est neque magno-  
pere vexatum, sinere oportet sanguinem fluere, quo  
minor inflammatio oriatur. Atque ingredi quoque  
eum paulum non alienum est, ut excidat, si quid  
intus concreti sanguinis mansit. Quod si per se non  
destitit, rursus, ne vis omnis intereat, subprimi debet;  
idque protinus in inbecillioribus ab ipsa curatione  
faciendum est: siquidem, ut distentione nervorum  
periclitatur aliquis, dum vesica eius agitatur, sic  
alter metus excipit, [remotis medicaminibus] ne tan-  
B tum sanguinis profluat, ut occidat. Quod ne incidat,  
desidere is debet in acre acetum, cui aliquantum  
salis sit adiectum; sub quo et sanguis fere con-  
quiescit, et adstringitur vesica, ideoque minus in-  
flammat. Quod si parum proficit, adglutinanda

<sup>1</sup> *Marx inserts feminis after in.*

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<sup>a</sup> VII. 26. 2 K.

<sup>b</sup> As in males, VII. 26. 3 C.  
VII. 26. 2 H.

about them. Since in women when the stone is small, the use of the knife is unnecessary because the stone is forced by the urine into the neck of the bladder which is shorter and more yielding in females than in males. Therefore the stone often escapes of itself, and if it sticks in the first part, which is narrower, yet it may be extracted by the scoop described above <sup>a</sup> without any harm. But for larger stones the treatment is the same.<sup>b</sup> Except that in the case of a virgin the fingers are passed as in males, in the case of a woman into the vagina. Then the incision is to be made in a virgin just under the left labium, in a woman between the urethra and pubic bone, and in both instances by a transverse wound.<sup>c</sup> There is no need to be frightened if there is freer bleeding from a woman.

When the stone has been extracted, if the patient is strong and has not suffered excessively, it is well to let the bleeding go on, so that less inflammation may follow. Besides it is not unfitting for him to move about a little, in order that any blood clot still inside may drop out. But if again the bleeding does not cease of its own accord, it must be stopped lest all his strength be used up; and in weaker patients this is to be done immediately after the operation; since just as there is the risk of spasm from pushing about the bladder, so there is a second danger that [in the absence of medicaments] so much blood may be lost as to prove fatal. To prevent this the patient should be seated in a bath of strong vinegar to which a little salt has been added; under this treatment the bleeding generally stops, and it also has an astringent effect on the bladder so that the inflammation there is lessened. But if this

## CELSUS

cucurbitula est et inguinibus et coxis et super pubem. Ubi iam satis vel evocatus est sanguis vel prohibitus, resupinus is collocandus est sic, ut caput humile sit, coxae paulum excitentur; ac super ulcus inponendum est duplex aut triplex linteolum aceto madens.

- C Deinde interpositis duabus horis in solum is aquae calidae resupinus demittendus est sic, ut a genibus ad umbilicum aqua teneat, cetera vestimentis circumdata sint, manibus tantummodo pedibusque nudatis, ut et minus digeratur et ibi diutius maneat: ex quo multus sudor oriri solet. Atque os spongia subinde et faciem detergendum est, finisque eius fomenti est, donec infirmando offendat. Tum multo is oleo perungendus, inducendusque absus lanae mollis tepido oleo repletus, qui pubem et coxas et inguina et plagam ipsam—contectam<sup>1</sup> † eodem ante sed linteolo—protegat; isque subinde oleo tepido madefaciendus est, ut neque frigus ad vesicam admittat et nervos leniter molliat. Quidam cataplas-matis calfacientibus utuntur; ea plus pondere nocent, quo vesicam urguendo vulnus iritant, quam calore proficiunt. Ergo ne vinculum quidem ullum necessarium est. Proximo die, si spiritus difficiliter redditur, si urina non excedit, si locus circa pubem mature intumuit, scire licet in vesica sanguinem concretum remansisse: igitur, demissis eodem modo digitis, leviter pertractanda vesica est, et discutienda,

<sup>1</sup> *Marx suggests that eodem is a corruption of madente aceto.*

<sup>a</sup> Absus (Hapsus, ἄψος). Celsus uses the word here and in IV. 13. 3 for a woollen bandage.

is not successful, cups are to be applied on groins and hips and above the pubes. As soon as sufficient blood has been drawn away or the bleeding checked, the patient should be so placed on his back that his head is low, his hips a little raised; and two or three layers of linen soaked in vinegar are to be applied over the wound. Then after two hours he should be put into a hip bath and lean back in the hot water, so that the water covers him from his knees to his navel, while the rest of his body is wrapped up, except that his hands and feet are exposed, in order that he may be less exhausted and remain in the bath longer: the usual result is free sweating. And his mouth and face must be wiped with a sponge from time to time, and an end put to this hot bath whenever it becomes harmful by weakening the patient. Afterwards the patient is freely rubbed with oil, and a dressing <sup>a</sup> of soft wool applied, soaked in warm oil, covering the pubes and hips and groins as well as the wound itself, which had previously been covered with a similar dressing, but of lint. From time to time this dressing is to be saturated with the warm oil in order that cold may not reach the bladder, and that the sinews may be gently softened. Some make use of heating plasters; these do more harm by their weight pressing upon the bladder, and by irritating the wound, than they do good by their heating. For the same reason not even a bandage is required. On the next day if there is difficulty in breathing, if urine is not passed, if the region about the pubes swells prematurely, it may be recognized that a blood clot has collected in the bladder; for this the fingers are introduced into the rectum as before and the bladder stroked gently so as to break up

## CELSUS

si qua coierunt; quo fit, ut per vulnus postea procedant. Non alienum est etiam oriculario clystere acetum nitro mixtum per plagam in vesicam compellere: nam sic quoque discutiuntur, si qua cruenta coierunt; eaque facere etiam primo die convenit, si timemus, ne quid intus sit, maximeque ubi ambulando id elicere inbecillitas prohibuit. Cetera eadem facienda sunt, ut demittatur in solio, ut eodem modo panniculus, eodem ulceri lana superiniciatur. Sed neque saepe neque tam diu in aqua calida puer habendus quam adulescens est, infirmus quam valens, levi quam graviore inflammatione adfectus, is cuius corpus digeritur quam is cuius astrictum est. Inter haec vero, si somnus est et aequalis spiritus et madens lingua et sitis modica et venter imus sedet, si mediocris est cum febre modica dolor, scire licet recte curationem procedere. Atque in his inflammatio fere quinto vel septimo die finitur; qua levata solium supervacuum est. Supini tantummodo vulnus aqua calida fovendum est, ut, si quid urinae rodit, eluatur. Inponenda autem medicamenta sunt pus moventia, et si purgandum ulcus videbitur, melle inlinendum: id si rodet, rosa temperabitur. Huic curationi aptissimum videbitur enneapharmacum emplastrum: nam et sebum habet ad pus movendum et mel ad ulcus repurgandum, medullam etiam maximeque vitulinam; quod in id, ne fistula relinquatur, praecipue proficit. Linamenta vero tum

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<sup>a</sup> V. 19. 10.

clots; thus they subsequently escape by the wound. It is not inappropriate to inject vinegar mixed with soda into the bladder through the wound by means of an ear syringe, for in this way also clotted blood is broken up; and it is proper to do this even on the first day if we are afraid that there is a clot inside, especially when weakness prevents the patient from moving about to eliminate it. The treatment afterwards is the same, sitting in a hot bath, a pad and wool prepared as before as dressings. But a boy should not be put so often into the hot water nor kept in so long as an adolescent; a weak patient as a robust one; one with a slight inflammation as one severely inflamed; a patient with a relaxed body as one in good tone. Meanwhile, if the patient sleeps and breathes regularly and his tongue is moist and there is only moderate thirst and the hypogastrium is flat, if there is not much pain and but moderate fever, we may assume that the treatment is doing well. In such cases the inflammation generally ends on the fifth or seventh day; when it has passed off, the hip bath becomes unnecessary; whilst the patient is on his back the wound is just to be fomented enough with hot water to wash away any urine that irritates. Now the medicaments to be applied should be suppuratives, and if the wound seems to need cleaning, it is to be smeared with honey, or if that irritates it can be tempered with rose oil. The nine-drug plaster <sup>a</sup> seems the most suitable at this stage of the treatment for it contains both suet as a suppurative, and honey to clean the wound, also marrow, best from a calf; its contents are particularly efficient in preventing the establishment of a fistula. But lint at this period is not to be

## CELSUS

super ulcus non sunt necessaria: super medicamentum ad id continendum recte inponuntur. At ubi ulcus purgatum est, puro linamento ad cicatricem perducendum est. Quibus temporibus tamen, si felix curatio non fuit, varia pericula oriuntur. Quae praesagire protinus licet: si continua vigilia est, si spiritus difficultas; si lingua arida est, si sitis vehemens; si venter imus tumet; si vulnus hiat, si transfluens urina id non rodit, . . .<sup>1</sup> similiter ante tertium diem quaedam livida excedunt; si is aut nihil aut tarde respondet; si vehementes dolores, si post diem quintum magnae febres urgent et fastidium cibi permanet, si cubare in ventrem iucundius est. Nihil tamen peius est distentione nervorum et ante diem nonum vomitu bilis. Sed cum inflammationis sit metus, succurri abstinencia, modicis et tempestivis cibis, inter haec fomentis, et quibus supra (B C) scripsimus, oportet.

27. Proximus canceri metus est. Is cognoscitur, si et per vulnus et per ipsum colem fluit sanies mali odoris, cumque eo quaedam a concreto sanguine non abhorrentia tenuesque carunculae lanulis similes; praeter haec, si orae vulneris aridae sunt, si dolent inguina; si febris non deficit, eaque in noctem augetur, si inordinati horrores accedunt. Considerandum autem est, in quam partem cancer is tendat. Si ad colem, indurescit is locus et rubet et tactu dolorem excitat, testiculi que intumescunt: si in ipsam vesicam, ani dolor sequitur, coxae durant, non facile

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<sup>1</sup> *Marx would insert si noctu et interdium after rodit, comparing II. 8. 32, and this is translated.*

<sup>a</sup> A bad symptom, as it shows the patient is too ill to feel.

<sup>b</sup> See Appendix I, p. 589 ff.

applied directly to the wound, but it may be properly put on over medicaments to keep them in place. When, however, the wound is clean, it is to be healed by applying plain lint. During this period, however, when the course of the treatment has not gone well, various dangers arise. These may be expected: if there is persistent insomnia, laboured breathing, a dry tongue, great thirst, a distended hypogastrium; if the wound gapes; if the urine as it escapes does not irritate<sup>a</sup> the wound; if there is some livid discharge (by night and day alike) before the third day; if the patient does not answer or replies slowly; if there are severe pains; if after the fifth day high fever oppresses the patient and a distaste for food persists; if he finds more ease by lying on his stomach. But the worst complication is spasm of sinews and bilious vomiting before the ninth day. But when there is danger of inflammation the best treatment is by abstinence, food in small quantities and at stated intervals, and at the same time fomentations and the other things described above.

27. The nearest danger is canker<sup>b</sup>. This is recognized if the discharge, whether from the wound, or through the penis, is a malodorous sanies, also something of the nature of blood-clot, and thin bits of flesh like flocks of wool; and in addition to this if the margins of the wound become dry; if there is pain in the groins; if the fever does not subside and it increases at night, if there are irregular shivering-fits as well. We must examine in what direction the canker is spreading. If to the penis, that part becomes hard and red and is painful to touch, and the testicles swell; if into the bladder itself, anal pain follows, the hips harden, the legs

## CELSUS

2 crura extendi possunt. At si in alterutrum latus, oculis id expositum est, paresque utrimque easdem notas sed minores habet.—Primum autem ad rem pertinet corpus recte iacere, ut superior pars eadem semper sit . . .<sup>1</sup> in quam vitium fertur. Ita si ad colem it, supinus is collocari debet; si ad vesicam, in ventrem; si in latus, in id, quod integrius est. Deinde ubi ventum fuerit ad curationem, homo in aquam demittetur, in qua marrubium decoctum sit aut cupressus aut myrtus; idemque umor . . .<sup>2</sup>

3 clystere intus agetur; tum superponetur lenticula cum malicorio mixta, quae utraque ex vino decocta sint; vel rubus aut oleae folia eodem modo decocta, aliave medicamenta, quae ad cohibendos purgandosque caneros proposuimus (V. 26. 32–34). Ex quibus si qua erunt arida, per scriptorium calamum inspirabuntur. Ubi stare coeperit cancer, mulso vulnus eluetur, vitabiturque eo tempore ceratum, quod ad recipiendum id malum corpus emollit: potius plumbum elotum cum vino inunguetur, superque

4 idem linteolo inlitum inponetur. Sub quibus perveniri ad sanitatem potest, cum eo tamen quod non ignoremus orto cancro saepe adfici stomachum, cui cum vesica quaedam consortio est; exque eo fieri, ut neque retineatur cibus neque, si quis retentus est, coquatur, neque corpus alatur, ideoque ne vulnus quidem aut purgari aut ali possit; quae necessario mortem maturant. Sed ut his succurri nullo modo

<sup>1</sup> *Marx would add eaque ipsa sit after sit.*

<sup>2</sup> *Marx notes an omission after umor, perhaps decoctus.*

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<sup>a</sup> V. 26. 32–34.

cannot be easily stretched. But if to either side, this fact is clear to the eyes, and the gangrene shows the same marks on both sides, but smaller on that less affected.—But first it is important that the patient shall lie properly, that is, that the same part should always be uppermost <and that that should be the part> where the disease is spreading. Thus if the direction is into the penis, the patient is laid on his back; if into the bladder, on his belly; if into one side, then he lies on the more sound one. Coming to the treatment, the man should be placed in a bath containing a decoction of horehound or of cyprus or of myrtle; and the same fluid <boiled> is injected into the wound with a syringe; then is put on a plaster of lentils with pomegranate rind, both of which have been boiled in wine, or a similar decoction of blackberry, or of olive leaves, or of other material which I have set out <sup>a</sup> as suitable for arresting and cleaning wounds affected by canker. Dry medicaments of this sort may be blown in through a quill. When the gangrene begins to come to a standstill, the wound is washed with honey wine, but at this stage a cerate should be avoided, for by softening the tissues it predisposes to that very malady: we must rather smear on washed lead with wine, over that the same spread on linen. By such measures it is possible to effect a cure, but we must not ignore the fact that when canker has once started, the stomach is often affected, since the bladder is closely associated with it; hence, it happens that food is not kept down, or when it is retained, not digested, nor is the body nourished; and thus the wound cannot clean, nor gain flesh: and these facts necessarily hasten death. But while it is in no way

## CELSUS

potest, sic a primo tamen diu tenenda ratio cura-  
tionis est; in qua quaedam observatio ad cibum  
5 quoque potionemque pertinens necessaria est. Nam  
cibus inter principia non nisi umidus dari debet:  
ubi ulcus purgatum est, ex media materia: holera  
et salsamenta semper aliena sunt. Potione opus est  
modica: nam si parum bibitur, accenditur vulnus, et  
vigilia urguet et vis corporis minuitur: si plus aequo  
adsumitur, subinde vesica impletur eoque inritatur.  
Non nisi aquam autem bibendam esse manifestius  
est, quam ut subinde dicendum sit. Solet vero sub  
6 eiusmodi victu evenire, ut alvos non reddatur. Haec  
aqua ducenda est, in qua vel faenum Graecum vel  
malva decocta sit. Idem umor rosa mixtus in ipsum  
vulnus oriculario clystere agendus est, ubi id rodit  
urina neque purgari patitur. Fere vero primo per  
vulnus exit haec; deinde eo sanescente dividitur, et  
pars per colem descendere incipit, donec ex toto  
plaga claudatur; quod interdum tertio mense, inter-  
dum non ante sextum, nonnumquam exacto quoque  
7 anno fit. Neque desperari debet solida glutinatio  
vulneris, nisi ubi aut vehementer rupta cervix est,  
aut ex cancro multae magnaeque carunculae simul-  
que nervosa aliqua exciderunt. Sed ut vel nulla ibi  
fistula vel exigua admodum relinquatur, summa cura  
providendum est. Ergo cum iam ad cicatricem vul-  
nus intendit, extentis iacere feminibus et cruribus

possible to save such cases as these, yet a method of treatment should be observed from the very first for a long while, in which of course due regard must be had to food and drink. For at first only fluid food should be given; when the wound has cleaned food of the middle class;<sup>a</sup> greens and salted fish are always unsuitable. The amount of drink should be moderate, for if too little is drunk, the wound becomes inflamed, the patient suffers from insomnia and gets weaker; if too much is drunk, the bladder fills frequently and so is irritated. It is too obvious to need repetition that nothing except water is to be drunk.<sup>b</sup> Now it generally happens under such a diet that the bowels do not act. They are to be moved by a clyster containing either fenugreek or mallow. The same decoction mixed with rose oil is to be injected into the wound itself through an ear syringe whenever the urine causes irritation and stops the wound from cleaning. Generally all the urine escapes at first through the wound; then in the course of healing it divides, and part begins to pass through the penis until the wound has completely closed; and this occurs at times in the third month, at times not before the sixth month, and occasionally not for a year. And we need not despair of the firm healing of the wound, unless the neck of the bladder has been roughly ruptured, or when owing to gangrene many large portions of the flesh have sloughed away and some fibrous tissue too. But the greatest care must be taken that no fistula, or only a very small one, is left there. With this object as the wound tends to form a scar, the patient should lie with his thighs

<sup>a</sup> Vol. I. p. 193 ff. (II. 18).

<sup>b</sup> VII. 16. 5.

## CELSUS

oportet, nisi tamen molles harenosive calculi fuerunt : sub his enim tardius vesica purgatur ; ideoque diutius plagam patere necessarium est et tum demum, ubi iam nihil tale extra fertur, ad cicatricem perducitur.

8 Quod si antequam vesica purgata est, orae se glutis narunt, dolorque et inflammatio redierunt, vulnus digitis vel averso specillo diducendum est, ut torquentibus detur exitus ; iisque effusis cum diutius pura urina descendat, tum demum quae cicatricem inducant ponenda sunt ; extendendique, ut supra (7) posui, pedes quam maxime iuncti. Quod si fistulae metus ex is causis, quas proposui (26. 2 I), subesse videbitur, quo facilius cludatur ea vel certe coangustetur, in anum quoque danda plumbea fistula est ; extentisque cruribus femina talique inter se deligandi sunt, donec, qualis futura est, cicatrix sit.

28. Et hoc quidem commune esse et maribus et feminis potest : proprie vero quaedam ad feminas pertinent, ut in primis quod earum naturalia nonnumquam inter se glutinatis oris concubitus non admittunt. Idque interdum evenit protinus in utero matris ; interdum exulceratione in his partibus facta, et per malam curationem hic oris sanescendo iunctis. Si ex utero est, membrana ori volvae opposita est ;  
2 si ex ulcere, caro idem replevit.—Oportet autem membranam duabus lineis inter se transversis inci-

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<sup>a</sup> VII. 26. 2 I.

and legs stretched out, except only when the stones have been soft and sandy: for then the bladder is slower in cleaning itself: and so it is necessary to keep the wound open longer, and only when there is nothing more to come out of the bladder is the wound allowed to heal. If the margins of the wound stick together, before the bladder has been cleaned, and pain and inflammation recur, the wound should be reopened, either by the finger, or by the reversed end of a probe, in order that what is causing the pain may be let out; and after such evacuation, when for some time clear urine has passed, then at length cicatrizing applications are put on; and as prescribed above, the legs are kept extended with the feet close together as much as possible. But if there seems to be danger of a fistula, from the causes mentioned above,<sup>a</sup> a leaden tube should be put into the anus to make the closing of the fistula easier, or at any rate to narrow it, whilst the legs are kept extended and the thighs and ankles tied together until the scar has assumed its final form.

28. And whilst the foregoing can occur both in males and females, there are also some troubles which are peculiar to females, especially that occasionally their genitals do not allow of coitus, the orifices having coalesced. And this sometimes happens even in the mother's womb; sometimes when ulceration has occurred in those parts, and through bad treatment there the margins have become united during healing. If the condition is congenital a membrane obstructs the vulvar orifice; if due to ulceration flesh has filled the same. The membrane should be incised along two lines crossing

## CELSUS

dere ad similitudinem litterae X, magna cura habita, ne urinae iter violetur, deinde undique eam membranam excidere. At si caro increvit, necessarium est recta linea patefacere; tum ab ora vel volsella vel hamo adpressa tamquam habenulam excidere et intus implicitum in longitudinem linamentum (lemniscum Graeci vocant) in aceto tinctum demittere, supraque succidam lanam aceto madentem deligare; tertio die solvere ulcus et sicut alia ulcera curare; cumque iam ad sanitatem tendet, plumbeam fistulam medicamento cicatricem inducente inlinere eamque intus dare, supraque idem medicamentum inicere, donec ad cicatricem plaga perveniat.

29. Ubi concepit autem aliqua, si iam prope maturus partus intus emortuus est neque excidere per se potest, adhibenda curatio est, quae numerari inter difficillima potest: nam et summam prudentiam moderationemque desiderat, et maximum periculum adfert. Sed ante omnia vulvae natura mirabilis cum in multis aliis tum in hac re quoque facile cognoscitur.—Oportet autem ante omnia resupinam mulierem transverso lecto sic collocare, ut feminibus eius ipsius ilia comprimantur; quo fit, ut et imus venter in conspectu medici sit et infans ad os vulvae 2 compellatur. Quae emortuo partu id comprimit, ex intervallo vero paulum dehiscere † ut.<sup>1</sup> Hac occasione usus medicus unctae manus indicem digitorum primum debet inserere atque ibi continere, donec

<sup>1</sup> *Marx conjectures consuevit for the corrupt ut (which is omitted by one MS.). Constantine dehiscit.*

one another like the letter X, great care being taken that the urethra is not injured; then the membrane is to be cut away all round. But if flesh has grown there, it must be laid open with a single straight cut; next when the margin has been seized either with a forceps or hook, a fine strip must be cut away from it, after which there is inserted wool rolled lengthwise (the Greeks call it *lemniscus*<sup>a</sup>), dipped in vinegar, and over this is bandaged on greasy wool wetted with vinegar: this is changed on the third day and the wound treated like other wounds; and as soon as it begins to heal, a lead tube smeared with a cicatrizing ointment is passed in, and over this the same application applied until the cut surface has cicatrized.

29. Again when a woman has conceived, if the foetus, already nearly at term, dies inside and cannot get out of itself, an operation must be done, which may be counted among the most difficult; for it requires both extreme caution and neatness, and entails very great risk. But this shows, and not this only, how marvellous beyond all else is the womb. To begin with then the woman should be placed on her back across the bed, so that the iliac regions are compressed by her own thighs; by this means both her hypogastrium is in full view of the surgeon and the foetus is forced towards the mouth of the womb. This, after the death of the foetus contracts, but later on usually dilates a little. The surgeon making use of this opportunity should first insert the index finger of his greased hand, and keep it there until the mouth

<sup>a</sup> *Lemniscus* (*λημνίσκος*) *taenia*, was a strip of wool (or of linen) used as a bandage.

## CELSUS

iterum ad [os] aperiatur, rursusque alterum digitum demittere debebit, et per easdem occasiones alios, donec tota esse intus manus possit. Ad cuius rei facultatem multum confert et magnitudo volvae et vis nervorum eius et corporis totius habitus et mentis etiam robur, cum praesertim intus nonnumquam  
3 etiam duae manus dari debeant. Pertinet etiam ad rem quam caldissimum esse imum ventrem et extrema corporis, nequedum inflammationem coepisse, sed recenti re protinus adhiberi medicinam. Nam si corpus iam intumuit, neque demitti manus neque educi infans nisi aegerrime potest sequiturque saepe cum vomitu, cum tremore mortifera nervorum distentio. Verum intus emortuo corpori manus iniecta protinus habitum eius sentit. Nam aut in caput aut in pedes conversum est, aut transversum iacet; fere tamen sic, ut vel manus eius vel pes in pro-  
4 pinquo sit. Medici vero propositum est, ut eum manu derigat vel in caput vel etiam in pedes, si forte aliter conpositus est: ac si nihil aliud est, manus vel pes adprehensus corpus rectius reddit: nam manus in caput, pes in pedes eum convertet. Tum si caput proximum est, demitti debet uncus undique levis, acuminis brevis, qui vel oculo vel auri vel ori, interdum etiam fronti recte inicitur; deinde  
5 ad tractus infantem educit. Neque tamen quolibet is tempore extrahi debet: nam si conpresso volvae ore id temptatum est, non emittente eo infans abrum-

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<sup>a</sup> *i.e.* into the anterior fontanelle.

is opened again, and then he should insert a second finger, and the other fingers on the like opportunity, until the whole hand can be put in. To allow of this, much depends both on the size of the vagina, and the resistance of its sinewy tissues, and the patient's constitution, and also her strength of mind, especially since on occasion even both hands have to be passed in. It is also important that the hypogastrium and extremities should be kept very warm, that inflammation should not have begun, but that the treatment should be adopted without delay. For if the abdomen is already distended, the hand cannot be inserted nor can the foetus be extracted without the greatest suffering, and fatal spasm of the sinews often follows, accompanied by vomiting and tremor. But when the hand has reached the dead foetus its position is immediately felt. For it lies head on or feet foremost, or crosswise; generally, however, so that there is either a hand or foot within reach. It is the object now of the surgeon to direct it with his hand either into a head or even into a foot presentation, if it happens to be presenting otherwise: and if there is no other course, when a hand or foot is grasped, the trunk is straightened: for grasping a hand converts the presentation into a head one, grasping a foot into a foot presentation. Then if the head is nearest, a hook must be inserted which is completely smooth, with a short point, and this it is right to fix into an eye or ear or the mouth, even at times into the forehead,<sup>a</sup> then this is pulled upon and extracts the foetus. But not every moment is proper for the extraction; for should this be attempted when the mouth of the womb is contracted, as there is no way out, the foetus is torn

## CELSUS

pitur, et unci acumen in ipsum os volvae delabitur; sequiturque nervorum distentio et ingens periculum [mortis]. Igitur compressa volva conquiescere, hiante leniter trahere oportet, et per has occasiones paulatim eum educere. Trahere autem dextra manus uncum, sinistra intus posita infantem ipsum, 6 simulque eum derigere debet. Solet etiam evenire, ut is infans umore distendatur, exque eo profluat foedi odoris sanies. Quod si tale est, indice digito corpus illud forandum est, ut effuso umore extenuetur; tum id leniter per ipsas manus recipiendum est. Nam uncus iniectus facile hebeti corpusculo labitur; in quo quid periculi sit, supra (5) positum est. In pedes quoque conversus infans non difficulter extrahitur; quibus adprehensis per ipsas manus 7 commode educitur. Si vero transversus est neque derigi potuit, uncus alae iniciendus, paulumque adtrahendus est; sub quo fere cervix replicatur, retroque caput ad relicum corpus spectat. Remedio est cervix praecisa, ut separatim utraque pars auferatur. Id unco fit, qui prioris (4) similis in interiorem tantum partem per totam aciem exacuitur. Tum id agendum est, ut ante caput, deinde reliqua pars auferatur, quia fere maiore parte extracta caput in vacuam volvam prolabitur, extrahique sine summo 8 periculo non potest. Si tamen id incidit, super ventrem mulieris duplici panniculo iniecto, valens homo

away from the hook, and its point then slips into the mouth of the womb itself; and there follows spasm of the sinews and great risk of death. Therefore whilst the mouth is contracted we should wait, and draw gently on the hook when it dilates, and so at these opportunities gradually extract the foetus. Now the right hand should pull the hook whilst the left is inserted within and pulls the foetus, and at the same time guides it. It also often happens that such a foetus is distended by fluid, and from it a foul sanies discharges. If so, the abdomen of the foetus is bored into by the index finger, when by escape of the fluid, the foetus is made smaller; then it is gently to be delivered by the hands alone. For if a hook is inserted it readily slips out of the soft little body, when the danger noted above is incurred. If the foetus has been turned to present by the feet it is also not difficult to extract; for the feet are grasped by the doctor's hands, and it is readily drawn out. But if the foetus is lying crosswise and cannot be turned straight, the hook is to be inserted into an armpit and traction slowly made; during this the neck is usually bent back, and the head turned backwards to the rest of the foetus. The remedy then is to cut through the neck, in order that the two parts may be extracted separately. This is done with a hook which resembles the one mentioned above, but has all its inner edge sharp. Then we must proceed to extract the head first, then the rest, for if the larger portion be extracted first, the head slips back into the cavity of the womb, and cannot be extracted without the greatest risk. Should this, however, happen, a folded pad is placed upon the woman's hypogastrium, and then

non inperitus a sinistro latere eius debet adsistere et super imum ventrem eius duas manus inponere alteraque alteram premere; quo fit, ut illud caput ad os vulvae compellatur; idque eadem ratione, quae supra (5) posita est, unco extrahere. . . .<sup>1</sup> At si pes alter iuxta repertus est, alter retro cum corpore est, quicquid protractum, paulatim abscidendum est: et si clunes os vulvae urguere coeperunt, iterum retro repellendae sunt, conquisitusque pes eius adducendus. Aliaeque etiamnum difficultates faciunt, ut, qui solidus non exit, concisus eximi debeat. Quotiens autem infans protractus est, tradendus ministro est, ut is eum supinis manibus sustineat; medicus deinde sinistra manu leniter trahere umbilicum debet ita ne abrumpat; dextra eum sequi usque ad eas, quas secundas vocant (quod velamentum infantis intus fuit), iisque ultimis adprehensis venulas membranulasque omnes eadem ratione manu deducere a volva, totumque illud extrahere et si quid intus  
 9  
 10 praeterea concreti sanguinis remanet. Tum compressis in unum feminibus, illa conclavi collocanda est modicum calorem sine ullo perflatu habente. Super imum ventrem eius inponenda lana sucida in aceto et rosa tincta. Reliqua curatio talis esse debet, qualis in inflammationibus et in is vulneribus, quae in nervosis locis sunt, adhibetur.

30. 1. Ani quoque vitia, ubi medicamentis non vincuntur, manus auxilium desiderant. Ergo si qua

<sup>1</sup> *Marx adds* : oportet *after* extrahere.

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\* It is noteworthy that there is no mention of midwife or other female assisting at the operation, or of the so-called Caesarean section, which was often performed after the death of the mother.

a man strong, but not untrained, must stand on her left side, and place his two hands over the hypogastrium and press one over the other so that the head is forced to the mouth of the womb, when it must be extracted by the hook as described above. But if one foot presents whilst the other remains behind with the trunk, anything which has been drawn out must be cut away piecemeal; and if the buttocks begin to engage in the mouth of the womb they are to be pushed back and the foot of the foetus found and then drawn forwards. There are also other difficulties, which make it necessary to cut up and extract a foetus which does not come out whole. Now as soon as the foetus has been extracted it should be handed to the assistant to hold on his upturned hands, and the surgeon with his left hand must draw gently upon the navel cord, so as not to rupture it, whilst he passes his right hand along it up to what they called the secundines, which was the envelope of the foetus within the womb. When his hand has grasped the secundines including the whole of the blood vessels and membranes he brings them down from the womb in the same manner, and extracts the whole together with any retained blood clot. Then when the thighs have been tied together the woman is put to bed in a moderately warm room, which is free from draughts. Over the hypogastrium is placed greasy wool, dipped in vinegar and rose oil. The rest of the treatment followed is the same as for inflammation and for wounds which are in the sinews.<sup>a</sup>

30. Lesions of the anus also, when they do not yield to medicaments,<sup>b</sup> require the aid of surgery.

<sup>a</sup> VI. 18. 7-11.

- scissa in eo vetustate induruerunt iamque callum habent, commodissimum est ducere alvum; tum spongiam calidam admovere, ut relaxentur illa et foras prodeant. Ubi in conspectu sunt, scalpello singula excidere et ulcera renovare; deinde inponere linamentum molle, et supra linteolum inlitum melle; locumque eum molli lana implere et ita vincire; altero die deincepsque ceteris lenibus medicamentis uti, quae ad recentia eadem vitia necessaria esse
- B alias (VI. 18. 7 A B, 9 B) proposui; et utique per primos dies sorbitionibus eum sustinere; paulatim deinde cibus adicere aliquid, generis tamen eius, quous eodem loco praeceptum est. Si quando autem ex inflammatione puris quid in his oritur, ubi primum apparuit, incidendum est, ne anus ipse suppuret. Neque tamen ante properandum est: nam si crudum incisum est, inflammationis multum accedit, et puris aliquanto amplius concitatur. In his quoque vulneribus lenibus cibus isdemque medicamentis opus est.
- 2 At tubercula, quae condylomata appellantur, ubi induruerunt, hac ratione curantur. Alvos ante omnia ducitur; tum vulsella tuberculum adprehensum iuxta radices praeciditur. Quod ubi factum est, eadem sequuntur, quae supra (I A) post curationem adhibenda proposui: tantummodo, si quid increscit, squama aeris coercendum est.
- 3 Ora etiam venarum fundentia sanguinem sic tolluntur. Ubi sanguis cui fluit, fames indicitur,<sup>1</sup> alvus

<sup>1</sup> *The text is uncertain. One MS., followed by several editors, has ubi sanguini qui effluit sanies adicitur "when sanies as well as blood is discharged."*

If therefore, any fissure <sup>a</sup> has persisted so long that it has become hard and callous, it is best to move the bowels by a clyster, then apply a hot sponge to soften the fissures and cause them to protrude. When brought into view each is excised and made into a fresh wound; then soft lint is put on and over this a pad smeared with honey, and all is covered with soft wool, fixed by a bandage; on the next and following days all the other emollient medicaments are to be used, which I said above,<sup>b</sup> were required by such lesions when recent, and for the first few days at any rate the patient must live on fluids; then some food is gradually added, but of the class prescribed in the same passage. If however any pus arises in these fissures as the result of inflammation, as soon as it becomes evident, it is to be cut into, lest the anus itself suppurate. But this must not be done hastily, for if cut before it matures the inflammation is very much increased, and pus is somewhat more freely formed. Here too a light diet and emollient dressings are necessary.<sup>c</sup>

The tumours, which are called condylomata,<sup>d</sup> when hardened are treated by the following method. First of all the bowel is clystered; then the tumour is seized with a forceps close to its roots and cut away. After this, the same course of treatment is followed as that described above; only if there is any excrescence it is repressed by copper scales.

The mouths of veins which discharge blood<sup>e</sup> are removed as follows. When any patient is losing

<sup>a</sup> VI. 18. 7 A, B.

<sup>b</sup> VI. 18. 7 A, B, 9 B.

<sup>c</sup> Fistula in ano, VII. 4. 4.

<sup>d</sup> VI. 18. 1 A, B, C.

<sup>e</sup> VI. 18. 9 A.

## CELSUS

acrius<sup>1</sup> ducitur, quo magis ora promoveantur; eoque fit, ut omnia venarum quasi capitula conspicua sint. Tum si capitulum exiguum est basimque tenuem habet, adstringendum lino paulum supra est, quam ubi cum ano committitur. Inponenda . . .<sup>2</sup> aqua calida spongia est, donec id liveat; deinde aut ungue aut scalpello supra nodum id exulcerandum est.

B Quod nisi factum est, magni dolores subsequuntur, interdum etiam urinae difficultas. Si id maius est et basis latior, hamulo uno aut altero excipiendum est paulumque supra basim incidendum; neque relinquendum quicquam ex eo capitulo neque quicquam ex ano demendum est. Quod consequitur is, qui neque nimium neque parum hamos ducit. Qua incisum est, acus debet inmitti infraque eam lino id

C capitulum alligari. Si duo triave sunt, imum quodque primum curandum est; si plura, non omnia simul, ne tempore eodem undique tenerae cicatrices sint. Si sanguis profluit, excipiendum est spongia; deinde linamentum inponendum; unguenda femina et inguina et quicquid iuxta ulcus est; ceratumque superdandum et farina hordiaca calida, inplendusque is locus est . . .<sup>3</sup> sic deligandus est. Postero die is

D plasmate foveri. Ac bis die, et ante curationem et post eam, cervices<sup>4</sup> ac femina liquido cerato perunguenda sunt; tepidoque is loco continendus. Interpositis quinque aut sex diebus oriculario specillo

<sup>1</sup> acrioribus *Constantine* for acrius.

<sup>2</sup> *Some words have fallen out. Marx suggests* deinde expressa ex.

<sup>3</sup> *Marx suggests that molli lana et has fallen out after est.*

<sup>4</sup> *Marx retains the MS. cervices, which does not seem to fit the context, V. d. Linden suggested coxendices, Targa coxae, hips.*

<sup>a</sup> *linamenta* refers to the threads described in § B above.

blood, fasting is indicated, and a rather severe clustering of the bowels, to make the openings more prominent, and thus what may be called the little heads of the veins all come into view. Then if a head is very small and has a thin base it must be tied by a flax thread, a little above where it joins the anus. A sponge squeezed out of hot water is next to be applied until it becomes livid, then with a finger-nail or scalpel it is to be scratched off above the knot. Unless this is done great pain follows, and sometimes even difficulty in urinating. If the head is larger and the base broader, it is seized by one or two hooks, and an incision made a little above the base; in doing this nothing of the head should be left nor anything taken away from the anus. This is accomplished by not drawing upon the hooks either too much or too little. When the incision has been made, a pin should be passed through, and under the pin the head is tied round with a linen thread. If there are two or three, the lowest must be dealt with first; if more, they are not all treated at once, to avoid having tender scars in several places at once. If there is bleeding, it is taken up in a sponge; then lint is put on, the thighs and groins anointed, as well as the parts near the wound; over it is applied a cerate and a poultice of barley meal, and this part must be filled up <with soft wool and> then bandaged. The next day, the patient should sit in hot water and after that have the same poultice applied. Twice a day, before and after the operation, the necks and thighs are to be anointed with a liquid cerate; and the patient must be kept in a warm room. After five or six days, the bits of linen<sup>a</sup> are removed

linamenta educenda. Si capitula simul non exciderunt, digito promovenda; tum lenibus medicamentis isdem, quae alias (*ad* 1 A) posui, ulcera ad sanitatem perducenda. Finito vitio, quemadmodum agendum esset, iam alias [superius] (1 B) exposui.

31. Ab his ad crura proximus transitus est, in quibus orti varices non difficili ratione tolluntur. Huc autem et earum venularum, quae in capite nocent, et eorum varicum, qui in ventre sunt, curationem distuli, quoniam ubique eadem est.—Igitur vena omnis, quae noxia est, aut adusta tabescit aut manu eximitur. Si recta est, si quamvis transversa tamen simplex, si modica est, ea melius aduritur. Si curva est et velut in orbem quosdam implicatur pluresque inter se involvuntur, utilius eximere est.
- 2 Adurendi ratio haec est: cutis superinciditur; tum patefacta vena tenui et retuso ferramento candente modice premitur, vitaturque, ne plagae ipsius orae adurantur, quas reducere hamulis facile est. Id interpositis fere quaternis digitis per totum varicem fit; et tum superinponitur medicamentum, quo adusta sanantur. At exciditur hoc modo: cute eadem ratione super venam incisa, hamulo orae excipiuntur; scalpelloque undique corpore vena deducitur; caveturque, [ne] inter haec ne ipsa laedatur; eique retusus hamulus subicitur; interpositoque eodem fere spatio, quod supra (2) positum est, in

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<sup>a</sup> P. 463; see also II. 284.

by the aid of an earscoop. If the little heads do not come away at the same time, they are to be removed by the finger; then by the same soothing medicaments which I have described above, the wounds are healed up. After the trouble has been ended I have already noted elsewhere what must be done.<sup>a</sup>

31. We next pass from the foregoing subjects to the legs, and if varicose veins occur here, they are removed by a procedure which is not difficult. To this place I have put off also the treatment of the small veins which cause trouble in the head, also of varicose veins on the abdomen, because it is all the same. Any vein therefore which is troublesome may be shrivelled up by cauterizing or cut out by surgery. If a vein is straight, or though crooked is yet not twisted, and if of moderate size, it is better cauterized. If a vein is curved and twisted as it were into intricate coils and involutions, it is better to cut it out. This is the method of cauterization: the overlying skin is incised, then the exposed vein is pressed upon moderately with a fine, blunt, hot cautery iron, avoiding a burn of the margins of the incision, which can easily be done by retracting them with hooks. This step is repeated throughout the length of the vein, generally at intervals of four fingers' breadth, after which a dressing is put on to heal up the burns. But excision is done in the following way: the skin is similarly incised over the vein, and the margins held apart by hooks; with a scalpel the vein is separated from surrounding tissue, avoiding a cut into the vein itself; underneath the vein is passed a blunt hook; the same procedure is repeated at the intervals noted above throughout

## CELSUS

eadem vena idem fit; quae quo tendat, facile hamulo extento cognoscitur. Ubi iam idem, quaecumque varices sunt, factum est, uno loco adducta per hamulum vena praeciditur, deinde qua proximus hamus est, adtrahitur [evellitur] ibique rursus absciditur. Ac sic undique varicibus crure liberato plagarum orae committuntur et super emplastrum glutinans inicitur.

**32.** At si digiti vel in utero protinus, vel propter communem exulcerationem postea cohaeserunt, scalpello diducuntur; dein separatim uterque non pingui emplastro circumdatur atque ita per se uterque sanescit. Si vero fuit ulcus in digito posteaque male inducta cicatrix curvum eum reddidit, primum malagma temptandum est; deinde, si id nihil prodest (quod et in veteri cicatrice et ubi nervi laessi sunt evenire consuevit) videre oportet, nervine id vitium an cutis sit. Si nervi est, attingi non debet: neque enim sanabile est: si cutis, tota cicatrix excidenda, quae fere callosa extendi digitum minus patiebatur; tum rectus sic ad novam cicatricem perducendus est.

**33.** Gangrenam inter ungues alasque aut inguina nasci, et si quando medicamenta vincantur, membrum praecidi oportere alio loco (V. 26. 34 D) mihi dictum est. Sed id quoque cum periculo summo fit: nam saepe in ipso opere vel profusione sanguinis vel animae defectione moriuntur. Verum hic quoque nihil interest, an satis tutum praesidium

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\* V. 26. 34 D.

the course of the vein which is easily traced by pulling on the hook. When the same thing has been done wherever there are swellings, at one place the vein is drawn forward by the hook and cut away; then, where the next hook is, the vein is drawn forwards and again cut away. After the leg has thus been freed throughout from the swellings the margins of the incisions are brought together and an agglutinating plaster put on over them.

32. But if the fingers, either before birth or later on account of ulceration of their adjacent surfaces, adhere together, they are separated by the knife; after that each finger is separately enclosed in a plaster without grease, and so each heals separately. If after ulceration of a finger, a badly formed scar has made it crooked, in the first place a poultice is tried, and if this is of no avail, which is generally the case with old scars and tendon injuries, we must see whether the trouble is in the tendon, or in the skin only. If it is in the tendon, it should not be touched, for the condition is incurable; if in the skin, the whole scar should be cut out, which had generally become hard and so did not allow the finger to be extended. When it had been thus straightened a new scar must be allowed to form there.

33. When gangrene has developed between the nails and in the armpits or groins, and if medicaments have failed to cure it, the limb, as I have stated elsewhere,<sup>a</sup> must be amputated. But even that involves very great risk; for patients often die under the operation, either from loss of blood or syncope. It does not matter, however, whether the remedy is safe enough, since it is the only

## CELSUS

sit, quod unicum est. Igitur inter sanam vitiatamque partem incidenda scalpello caro usque ad os est sic, ut neque contra ipsum articulum id fiat, et potius ex sana parte aliquid excidatur quam ex aegra relinquatur. Ubi ad os ventum est, reducenda ab eo sana caro et circa os subsecanda est, ut ea quoque parte aliquid os nudetur; deinde id serrula praecidendum est quam proxime sanae carni etiam inhaerenti: ac tum frons ossis, quem serrula exasperavit, levandus est, supraque inducenda cutis, quae sub eiusmodi curatione laxanda est, ut quam maxime undique os contegat. Quo cutis inducta non fuerit, id linamentis erit contegendum, et super id spongia ex aceto deliganda. Cetera postea sic facienda, ut in vulneribus, in quibus pus moveri debet, praeceptum est (V. 26. 27 B).

one. Therefore, between the sound and the diseased part, the flesh is to be cut through with a scalpel down to the bone, but this must not be done actually over a joint, and it is better that some of the sound part should be cut away than that any of the diseased part should be left behind. When the bone is reached, the sound flesh is drawn back from the bone and undercut from around it, so that in that part also some bone is bared; the bone is then to be cut through with a small saw as near as possible to the sound flesh which still adheres to it; next the face of the bone, which the saw has roughened, is smoothed down, and the skin drawn over it; this must be sufficiently loosened in an operation of this sort to cover the bone all over as completely as possible. The part where the skin has not been brought over is to be covered with lint; and over that a sponge soaked in vinegar is to be bandaged on. The remaining treatment is that prescribed for wounds in which suppuration is to be brought about.<sup>a</sup>

<sup>a</sup> V. 26. 27 B. The amputation described by Celsus was often used in the war of 1914-18 for stumps which had become pointed after emergency amputations. In doing the operation arteries which have already become closed are not re-opened.

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**BOOK VIII**

## LIBER VIII

1. SUPEREST ea pars, quae ad ossa pertinet; quae quo facilius accipi possit, prius positus figurasque eorum indicabo.

Igitur calvaria incipit, ex interiore parte concava, extrinsecus gibba, utrimque levis, et qua cerebri membranam contegit et qua cute capillum gignente contegitur; eaque simplex ab occipitio et temporibus, duplex usque in verticem a fronte. Ossaque eius ab exterioribus partibus dura, ab interioribus, quibus inter se conectuntur, molliora sunt; interque ea venae discurrunt, quas his alimentum subministrare credibile est. Rara autem calvaria solida sine suturis est; locis tamen aestuosis facilius invenitur; et id caput firmissimum atque a dolore tutissimum est. Ex ceteris, quo suturae pauciores sunt, eo capitis valetudo commodior est: neque enim certus earum numerus est, sicut ne locus quidem. Fere tamen duae insuper aures tempora a superiore capitis parte discernunt; tertia ad aures per verticem tendens occipitium a summo capite diducit.

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3 Quarta ab eodem vertice per medium caput ad

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<sup>a</sup> See Appendix, p. 593.

<sup>b</sup> Cf. Herodotus IX. 83, where a skull is said to have been found on the battlefield of Plataea which had no sutures at all.

## BOOK VIII

1. THE remaining part of my work relates to the bones; and to make this more easily understood, I will begin by pointing out their positions and shapes.

First then comes the skull,<sup>a</sup> concave internally, convex externally, on both aspects smooth, where it covers the cerebral membrane as well as where it is covered by the skin bearing hair; and it is in one layer from the back of the head to the temples, in two layers from the forehead to the vertex. Its bones are hard externally, but the inner parts which connect them together are softer, and between these run large blood-vessels which probably supply their nutrition. It is rare for the skull to be solid without sutures; in hot countries, however, this is more easily found<sup>b</sup>; and that kind of head is the firmest and safest from headaches. As for the rest, the fewer the sutures, the better for the heads; and there is no certainty as to the number, or even as to the position of the sutures. Generally, however, there are two above the ears separating the temples from the upper part of the head: a third stretches to the ears across the vertex and separates the occiput from the top of the head. A fourth runs likewise from the vertex over the middle of the head

frontem procedit; eaque modo sub imo capillo desinit, modo frontem ipsam secans inter supercilia finit . . .<sup>1</sup> Ex his ceterae quidem suturae in unguem committuntur: eae vero, quae super aures transversae sunt, totis oris paulatim extenuantur atque ita inferiora ossa superioribus leniter insidunt. Crassissimum vero in capite os post aurem est, qua capillus, 4 ut verisimile est, ob id ipsum non gignitur. Sub iis [quo]que musculis, qui tempora conectunt, os medium in exteriorem partem inclinatum positum est. At facies suturam habet maximam, quae a tempore incipiens per medios oculos naresque transversa pervenit ad alterum tempus. A qua breves duae sub interioribus angulis deorsum spectant; et malae quoque in summa parte singulas transversas suturas habent. A mediisque naribus aut superiorum dentium gingivis per medium palatum una procedit, aliaque transversa idem palatum secat. Et suturae quidem in plurimis hae sunt.

5 Foramina autem intra caput maxima oculorum sunt, deinde narium, tum quae in auribus habemus. Ex his quae oculorum sunt, recta simplicia ad cerebrum tendunt. Narium duo foramina osse medio discernuntur: siquidem hae primum a superciliis angulisque oculorum osse inchoantur ad tertiam fere partem; deinde in cartilaginem versae, quo propius ori descendunt, eo magis caruncula quoque molliuntur. Sed ea foramina, quae a summis ad imas 6 nares simplicia sunt, ibi rursus in bina itinera dividuntur; aliaque ex his ad fauces pervia spiritum et

<sup>1</sup> *Marx notes that a mention of the coronal suture has dropped out.*

to the forehead, sometimes ending at the hairy margin, sometimes dividing the forehead itself and ending between the eyebrows. Most of these are dovetailed, but those which cross over above the ears are bevelled off a little all along their margin so that the lower bones smoothly overlap the upper. Now the thickest bone in the head is behind the ear, where hair does not grow, probably on that very account. Under the muscles covering the temples is situated the middle bone which slopes outwards. But the face has the largest suture; it begins at one temple, passes across the middle of the orbits and nose to the other temple. From this suture two short sutures are directed downwards from the inner corners of the eyes; and the cheeks at their upper parts also have transverse sutures. From the middle of the nostrils or of the gums of the upper teeth, one suture runs back through the middle of the palate, another cuts the same palate transversely. These are the sutures found in most skulls.

Now the largest passages leading into the head are those of the eyes, next the nostrils, then those of the ears. Those of the eyes lead direct and without branching to the brain. The two nasal passages are separated by an intermediate bone. These begin at the eyebrows and eye-corners, and their structure is for almost a third part bony, then changes into cartilage, and the nearer they get to the mouth the more soft and fleshy their structure becomes. Now these passages are single between the highest and lowest part of the nostrils, but there they each break up into two branches, one set from the nostrils to the throat<sup>a</sup> for expiration and inspiration,

<sup>a</sup> nasopharyngeal, or respiratory passages.

## CELSUS

- reddunt et accipiunt, alia ad cerebrum tendentia ultima parte in multa et tenuia foramina dissipantur, per quae sensus odoris nobis datur. In aure quoque primum rectum et simplex iter; procedendo flexuosum fit. Quod ipsum iuxta cerebrum in multa et tenuia foramina diducitur, per quae facultas audiendi
- 7 est. Iuxtaque ea duo parvuli quasi sinus sunt; superque eos finitur os, quod transversum a genis tendens ab inferioribus ossibus sustinetur: iugale appellari potest, ab eadem similitudine, a qua id Graeci zygodes appellant. Maxilla vero est molle os; eaque una est, cuius eadem et media et ima pars mentum est, a quo utrimque procedit ad tempora; solaque ea movetur: nam malae cum toto osse, quod superiores dentes exigit, immobiles sunt.
- 8 Verum ipsius maxillae partes extremae quasi bicornes sunt. Alter processus infra latior vertice ipso tenuatur, longiusque procedens sub osse iugali subit, et super id temporum musculis inligatur. Alter brevior et rotundior et in eo sinu, qui iuxta foramina auris est, cardinis modo † fit<sup>1</sup>; ibique huc et illuc se inclinans maxillae facultatem motus praestat.
- 9 Duriores osse dentes sunt, quorum pars maxillae, pars superiori ossi malarum haeret. Ex his quaterni primi, quia secant, tomis a Graecis nominantur; hi deinde quattuor caninis dentibus ex omni parte cinguntur; ultra quos utrimque fere maxillares quaterni

<sup>1</sup> *Marx conjectures that this word should be insidet.*

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<sup>a</sup> ζυγοειδής or ζύγωμα (cf. Hippocrates III., p. 263). The bone is still known as the os jugale or zygoma.

the other leading to the brain and split up in its last part into numerous small channels through which we get our sense of smell. In the ear the passage is also at first straight and single, but as it goes further becomes tortuous. And close to the brain this too is divided into numerous fine passages which give the faculty of hearing. Adjacent to the passages there are two little pits, as it were, above which ends the bone which stretches across from the cheek, supported by deeper-seated bones: it may be called the yoke,<sup>a</sup> from the same resemblance which led the Greeks to call it *zygodes*. But the lower jaw is a soft bone<sup>b</sup> and a single one, of which the chin forms the middle and lowest portion, whence it is continued on the two sides to the temples; and it alone is movable, for the cheek-bones with all that bone which produces the upper teeth are immobile. Now the ends of the lower jaw itself form, as it were, two horns. One process broader below tapers towards its tip, and as it passes higher, goes under the *zygoma*, and is fastened to the temporal muscles above it. The other is shorter and more rounded off, and in that pit which is adjacent to the auditory passages, it is set in a sort of hinge, and as it bends there forwards and backwards supplies the power of movement to the lower jaw.

The teeth are harder than bone, some are fixed in the lower jaw, some in the cheek-bones. Of the teeth, the four in front are named by the Greeks *tomis*<sup>c</sup> because they cut. These are flanked at each side by four canine teeth. Behind these on either side is generally a set of four molars, except in those who

<sup>b</sup> This is not correct. See Appendix, p. 595, note c.

<sup>c</sup> *τομείς* = incisors.

## CELSUS

- sunt, praeterquam in iis . . .<sup>1</sup> Sunt, quibus IV ultimi, 10 qui sero gigni solent, non increverunt. Ex his priores singulis radicibus, maxillares utique binis, quidam etiam ternis quaternisve nituntur; fereque longior radix brevior dentem edit; rectique dentis recta etiam radix, curvi flexa est. Exque eadem radice in pueris novus dens subit, qui multo saepius priorem expellit, interdum tamen supra infrave eum se ostendit.
- 11 Caput autem spina excipit. Ea constat ex vertebra quattuor et viginti: septem in cervice sunt, duodecim ad costas, reliquae quinque sunt proximae costis. Eae teretes brevesque; ab utroque latere processus duos exigunt; mediae perforatae, qua spinae medulla cerebro commissa descendit, circa quoque per duos processus tenuibus cavis perviae, per quae membrana cerebri similes membranulae deducuntur; omnesque vertebrae exceptis tribus summis a superiore parte in ipsis processibus paulum desidentis sinus habent; ab inferiore alios deorsum 12 versus processus exigunt. Summa igitur protinus caput sustinet, per duos sinus receptis exiguis eius processibus; quo fit, ut caput susum deorsum versus . . .<sup>2</sup> Tuberi exasperatur secunda, superiori parte . . . inferiore.<sup>3</sup> Quod ad circuitum pertinet, pars summa angustiore orbe finitur; ita superior ei

<sup>1</sup> *Marx would add*: in quibus singulis postea natis sunt quini, *after* in iis.

<sup>2</sup> *Marx adds* moveatur.

<sup>3</sup> *Marx adds* inhaerens *after* parte.

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<sup>a</sup> Translating Marx's conjecture, but the text is doubtful and has been variously emended.

<sup>b</sup> The atlas vertebra.

<sup>c</sup> The axis vertebra.

have five <sup>a</sup> <one tooth on each side coming through later>. There are some in whom the four last, which generally come through late, do not make their appearance. Of these teeth the front ones are fixed by single roots, the molars at least by two, sometimes even by three or four; and generally the longer root produces the shorter teeth; the straight tooth has a straight root; a crooked tooth a crooked root. From the same root in children a new tooth grows which generally pushes out the former one, but sometimes shows itself behind or in front of it.

Now the spine is the support of the head. It is composed of twenty-four vertebrae, seven in the neck, twelve belonging to the ribs; the remaining five are below the ribs. The vertebrae are bones rounded off and short; from each side they thrust out a transverse process; they are perforated in the middle where the spinal marrow which is connected with the brain passes downwards, and at the sides also through the two transverse processes they are traversed by fine channels, through which little membranes pass down resembling the cerebral membrane; with the exception of the three highest all the vertebrae have slight depressions in their articular processes on the upper side, on the lower side other articular processes grow downwards. The highest vertebra <sup>b</sup> is therefore the immediate support of the head, receiving its small processes into two depressions, and this enables the head to move up and down. The second vertebra <sup>c</sup> is made irregular by a protuberance and is attached to the lower side of the one above. To secure the rotation of the head the top of it ends in a narrower round process, so that the first vertebra

## CELSUS

summae circumdata in latera quoque caput moveri  
sinit. Tertia eodem modo secundam excipit; ex  
13 quo facilis cervici mobilitas est. Ac ne sustineri  
quidem caput posset, nisi utrimque recti valentesque  
nervi collum continerent, quos *τένοντας* Graeci ap-  
pellant; siquidem horum inter omnes flexus alter  
semper intentus ultra prolabi superiora non patitur.  
Iamque vertebra tertia tubercula, quae inferiori  
inserantur, exigit: ceterae processibus deorsum spec-  
tantibus in inferiores insinuantur, ac per sinus, quos  
utrimque habent, superiores accipiunt, multisque  
14 nervis et multa cartilagine continentur. Ac sic, uno  
flexu modico in promptum dato, ceteris negatis,  
homo et rectus insistit, et aliquid ad necessaria  
opera curvatur.

Infra cervicem vero summa costa contra umerum  
sita est; inde VI inferiores usque ad imum pectus  
perveniant; eaeque primis partibus rotundae et  
leniter quasi capitulatae vertebrarum transverses  
processibus et ipsis quoque paulum sinuatis inhae-  
rent; inde latescunt et in exteriorem partem re-  
curvatae paulatim in cartilaginem degenerant; eaque  
parte rursus in interiora leniter flexae committuntur  
15 cum osse pectoris. Quod valens et durum a faucibus  
incipit, ab utroque latere lunatum et a praecordiis  
iam ipsum quoque cartilagine mollitum terminatur:  
sub costis vero prioribus, quinque, quas *ρόθας* Graeci  
nominant, breves tenuioresque atque ipsae quoque

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\* Stretchers. See Hippocrates III. 288 (*Joints*, XLV.).

encircling the top of this allows the head to turn sideways as well. After the same fashion the third vertebra supports the second, hence there is easy movement in the neck. And the neck could not even hold up the head were it not supported on each side by straight and powerful sinews which the Greeks call *τένοντες*<sup>a</sup>; since whenever the head bends one of the sinews is always tense, and does not allow what is above to slip too far over. From the third vertebra in turn grow little protuberances which are inserted into the vertebra below; the remaining vertebrae are fastened into the ones below them by processes directed downwards and support the ones above them in the depressions which they have on either side, and they are held together by many ligaments and cartilages. Thus by bending once in the required direction and avoiding moving in other directions man stands upright, or bends somewhat, to do anything that is required.

Below the neck the highest rib is placed on a level with the shoulders; after that there are six lower ribs, reaching as far as the bottom of the thorax; the ribs, which in their first part are rounded and end in small heads, as it were, are lightly fixed to the transverse processes of the vertebrae, which themselves have slight depressions; then the ribs flatten out and after curving outwards gradually degenerate into cartilage, and here, after again bending slightly inwards, they become united to the breast-bone. This, a strong and hard bone, begins below the throat, is lunated on each side, and, when it becomes itself softened into cartilage, is bounded by the *praecordia*. Below the upper ribs, there are five called by the Greeks *nothae*; they are short, thinner, and after changing gradually into

## CELSUS

- paulatim in cartilaginem versae extremis abdominis partibus inhaerescunt; imaque ex his maiore iam parte nihil nisi cartilago est. Rursus a cervice duo lata ossa utrimque ad scapulas tendunt: nostri scutula operta, omoplatas Graeci nominant. Ea summis verticibus sinuata, ab his triangula, paulatimque latescentia ad spinam tendunt; et quo latiora quaque parte sunt, hoc hebetiora. Atque ipsa quoque in imo cartilaginosa posteriore parte velut innatant, quoniam nisi † vel<sup>1</sup> in summo nulli ossi inhaerescunt, ibi vero validis musculis nervisque constricta sunt. At a summa costa paulo interius quam ubi ea media est os excrescit, ibi quidem tenue, procedens vero, quo propius lato scapularum ossi fit, eo plenius latiusque et paulum in exteriora curvatum; quod altera verticis parte modice intumescens sustinet iugulum. Id autem ipsum recurvum ac neque inter . . .<sup>2</sup> durissima ossa numerandum, altero capite in eo, quod posui, altero in exiguo sinu pectoralis ossis insidit, paulumque motu brachii movetur, et cum lato osse scapularum infra caput eius nervis et cartilagine conecitur.
- 18 Hinc umerus incipit, extremis utrimque capitibus tumidus, mollis, sine medulla, cartilaginosus: medius teres, durus, medullosus; leniter gibbus et in priorem et in exteriorem partem. Prior autem pars est, quae a pectore est, posterior, quae a scapulis; interior, quae ad latus tendit, exterior, quae ab eo

<sup>1</sup> Most Edd. delete *vel* which as it stands is meaningless. Marx suggests that *leviter* should be read instead.

<sup>2</sup> Marx would add: *solidissima neque inter*.

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\* For the meaning of *hebetiora* and an explanation of the description, see Appendix, p. 597, esp. note *d*.

cartilage, they are embedded in the highest part of the abdomen. The lowest of these consists for the most part only of cartilage. Again, from the neck two wide bones extend to the shoulders on each side; we call them *scutula aperta*, the Greeks *omoplateae*. These bones are curved at their highest point, and below these they are triangular, and become gradually wider as they approach the spine. As they become wider, they become blunter.<sup>a</sup> And they too at the lowest part soften into cartilage at the back and float, as it were, since they are unconnected with any other bone except at the top, but there they are held in place by very strong muscles and sinews. Now at the level of the first rib, and a little behind its middle, a bone<sup>b</sup> grows out which at first is slight but as it comes nearer the broad bone of the shoulder-blades becomes thicker and broader, and curves slightly outwards; and this at its other upper end is enlarged somewhat to support the root of the neck. But this bone itself is curved, and must not be reckoned among the hardest or most solid, and it lies with one head fixed as just stated, the other in a small depression of the breast-bone; it moves a little with the movement of the arm, and is connected with the flat bone of the shoulder-blades by sinews and cartilage.

From this point begins the humerus, which at both ends is swollen out, and is there soft, without marrow and cartilaginous; in the middle cylindrical, hard, containing marrow; and slightly curved both forwards and outwards. Now its front part is that on the side of the chest, its back, that on the side of the shoulder-blades; its inner part that which faces the

<sup>b</sup> The collar-bone. See Appendix, p. 598.

## CELSUS

recedit; quod ad omnes articulos pertinere in  
19 ulterioribus patebit. Superius autem umeri caput  
rotundius quam cetera ossa, de quibus adhuc dixi,  
parvo excessu vertici lati scapularum ossis inseritur,  
ac maiore parte extra situm nervis deligatur.

At inferius duos processus habet, inter quos quod  
medium est magis etiam extremis partibus sinuatur.  
Quae res sedem brachio praestat, quod constat ex  
ossibus duobus. Radius, quam *cercida* Graeci  
appellant, superior breviorque, et primo tenuior,  
rotundo et leniter cavo capite exiguum umeri  
tuberculum recipit, atque ibi nervis et cartilagine  
20 continetur. Cubitus inferior longiorque et primo  
plenior, in summo capite duobus quasi verticibus  
extantibus in sinum umeri, quem inter duos pro-  
cessus eius esse proposui, (19) se inserit. Primo  
vero duo brachii ossa vineta paulatim dirimuntur,  
rursusque ad manum coeunt modo crassitudinum  
mutato, siquidem ibi radius plenior, cubitus admo-  
dum tenuis est. Dein radius in caput cartilagosum  
consurgens in vertice eius sinuatur. Cubitus rotun-  
21 dus in extremo parte altera paulum procedit. Ac  
ne saepius dicendum sit, illud ignorari non oportet,  
plurima ossa in cartilaginem desinere, nullum arti-  
culum non sic finiri: neque enim aut moveri  
posset, nisi levi inniteretur, aut cum carne ner-  
visque coniungi, nisi ea media quaedam materia  
committeret.

side, its outer away from the side. It will be clear in later chapters that this applies to all joints. Now the upper head of the humerus is more rounded than any other bone hitherto described and is inserted by a small excrescence into the top of the wide bone of the shoulder-blades, and the greater part of it is held fast by sinews outside its socket.

The humerus at its lower end has two processes, between which the bone is hollowed out even more than at its extremities. This furnishes a seat for the forearm, which consists of two bones. The radius, which the Greeks call *cercis*, is the uppermost and shorter; at its beginning it is thinner, with a round and slightly hollowed head which receives a small protuberance of the humerus; and it is kept in place there by sinews and cartilage. The ulna is further back and longer and at first larger, and at its upper extremity is inserted by two outstanding prominences into the hollow of the humerus which, as I said above, is between the two processes. At their upper ends the two bones of the forearm are bound together, then they gradually separate, to come together again at the wrist, but with an alteration in size; since there the radius is the larger whilst the ulna is quite small. Further, the radius as it enlarges into its cartilaginous extremity is hollowed out at its tip. The ulna is rounded at the extremity, and projects a little at one part. And, to avoid repetition, it should not be overlooked that most bones turn into cartilage at their ends, and that all joints are bounded by it, for movement would be impossible unless apposition were smooth, nor could they be united with flesh and sinews unless some such intermediary material formed the connection.

## CELSUS

- In manu vero prima palmae pars ex multis minutisque ossibus constat, quorum numerus incertus est, sed oblonga omnia et triangula, structura quadam, inter se conecuntur, cum invicem superior alterius angulus, alterius planities sit: eoque fit ex his unius
- 22 ossis paulum in interiora concavi species. Verum ex manu duo exigui processus in sinus radi coiciuntur; tum ex altera parte recta quinque ossa ad digitos tendentia palmam explent; a quibus ipsi digiti oriuntur, qui ex ossibus ternis constant; omniumque eadem ratio est. Interius os in vertice sinuatur, recipitque exterioris exiguum tuberculum, nervique ea continent; a quibus orti ungues indurescunt, ideoque non ossi sed carni magis radicibus suis inhaerent.
- 23 Ac superiores quidem partes sic ordinatae sunt. Ima vero spina in coxarum osse desidit, quod transversum longeque valentissimum volvam, vesicam, rectum intestinum tuetur; idque ab exteriori parte gibbum, ad spinam resupinatum, a lateribus [id est ipsis coxis] sinus rotundos habet; a quibus oritur os, quod pectinem vocant, idque super intestina sub pube transversum ventrem firmat; rectius in viris, recurvatum magis in exteriora in feminis, ne partum prohibeat.
- 24 Inde femina ordiuntur, quorum capita rotundiora etiam quam umerorum sunt, cum illa ex ceteris rotundissima sint: infra vero duos processus a priore et a posteriore parte habent; dein dura et medullosa et ab exteriori parte gibba, rursus inferioribus

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<sup>a</sup> The pubis bone or *pecten*.

Turning to the hand, the first part of the palm consists of many minute bones of which the number is uncertain, but all are oblong and triangular, and are connected together on some plan since the upper angle of one alternates with the base of another; therefore they appear like one bone which is slightly concave. Now two small bones project from the hand and are fitted into the hollow of the radius; and at the other end five straight bones directed towards the fingers complete the palm; from these spring the fingers themselves, each composed of three bones; and all are similarly formed. A lower bone is hollowed out at its top to admit a small protuberance from an upper bone, and sinews keep them in place; from them grow nails which become hard, and thus these adhere by their roots to flesh rather than to bone.

And such are the arrangements for the upper limbs. Now the bottom of the spine is fixed between the bone of the hips, which lies crosswise and is very strong and so protects the womb, bladder and rectum; and the bone bulges out externally, is bent up towards the spine, and on the sides [that is, the hips proper], it has rounded hollows; and from these start the bone they call the comb,<sup>a</sup> situated crosswise above the intestines below the pubes, and this supports the belly; in men the bone is straight, in women more curved outwards so as not to hinder parturition.

Next in order are the thigh-bones, the heads of which are even more globular than those of the arm-bones, although those are the most globular of the other bones; below there are two processes, one directed forward, the other backward; after this the bones are hard and marrowy and convex on the outer

## CELSUS

quoque capitibus intumescunt. Superiora in sinus coxae, sicut umeri in ea ossa, quae scapularum sunt, coiciuntur; tum infra introrsum leniter intendunt, quo aequalius superiora membra sustineant. At inferiora capita media sinuantur; quo facilius excipi  
25 cruribus possint. Quae commissura osse parvo, molli, cartilaginosa tegitur: patellam vocant. Haec super innatans, neque ulli ossi inhaerens, sed carne et nervis deligata, pauloque magis ad femoris os tendens inter omnes crurum flexus iuncturam tuetur.

Ipsam autem crus est ex ossibus duobus: etenim per omnia femur umero, crus vero brachio simile est, adeo ut habitus quoque et decor alterius ex altero cognoscatur: quod ab ossibus incipiens etiam  
26 in carne respondet. Verum alterum os ab exteriori parte [id est supra] positum est, quod ipsum quoque sura nominatur. Id brevius supraque tenuius ad ipsos talos intumescit. Alterum a priore parte positum, cui tibiae nomen est, longius et in superiore parte plenius, solum cum femoris inferiore capite committitur, sicut cum umero cubitus. Atque ea quoque ossa, infra supraque coniuncta, media ut in  
27 brachio dehiscunt. Excipitur autem crus infra osse transverso talorum; idque ipsum super os calcis situm est, quod quadam parte sinuatur, quadam excessus habet, et procedentia ex talo recipit et in sinum eius inseritur. Idque sine medulla durum

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<sup>a</sup> The condyles.

<sup>b</sup> The fibula: the name *sura* is not now applied to this bone, though the *tibia* is still called by the same name.

side, and they are again enlarged at their lower ends also. The upper ends are inserted into hollows of the hip-bones, as the arm-bones into the shoulder-bones; then these tend gently downwards and inwards in order that they may support the upper parts of the body more evenly. But the heads<sup>a</sup> at the lower end have a hollow in between, that the leg-bones may be more easily fixed into them. Their juncture is covered by a small, soft, cartilaginous bone, called the knee-cap. This bone, which floats freely and is not attached to any other bone, but held in place by flesh and sinews, is turned slightly towards the thigh-bone and protects the joint in all movements of the legs.

The leg itself is made up of two bones; for as the thigh-bone is throughout similar to the humerus, so is the leg like the forearm, hence the form and appearance of the one can be learnt from the other: and what holds good for the bones holds also for the soft parts. One bone lies outside, and this too itself is called the calf.<sup>b</sup> It is the shorter, and is smaller in its upper part, but swells out just at the ankles. The other is placed more in front and is named tibia; it is the longer, and is larger at the upper end, and it alone joins with the lower head of the thigh-bone, as the ulna does with the humerus. These two bones, moreover, are joined together at the lower and upper ends, but in the middle as in the forearm they are separated. The leg below is received by the transverse bone of the ankles, which itself is set upon the heel-bone; the heel-bone is hollowed out in one part, and has excrescences at another part, so that it receives the excrescences of the ankle and is received itself into the hollow of the ankle. The

## CELSUS

magisque in posteriorem partem proiectum teretem ibi figuram repraesentat. Cetera pedis ossa ad eorum, quae in manu sunt, similitudinem structa sunt: planta palmae, digiti digitis, unguis unguibus respondent.

2. Omne autem os, ubi iniuria accessit, aut vitiatur aut finditur aut frangitur aut foratur aut conluditur aut loco movetur.

Id quod vitiatum est, primo fere pingue fit, deinde vel nigrum vel cariosum; quae supernatis gravibus ulceribus aut fistulis, hisque vel longa vetustate vel etiam cancro occupatis, eveniunt.—Oportet autem ante omnia os nudare ulcere exciso, et, si latius est eius vitium quam ulcus fuit, carnem subsecare, donec 2, undique os integrum pateat; tum id, quod pingue est, semel iterumve satis est admoto ferramento adurere, ut ex eo squama secedat; aut radere, donec iam aliquid cruoris ostendatur, quae integri ossis nota est: nam necessum est aridum sit id, quod vitiatum est. Idem in cartilagine quoque laesa faciendum est: siquidem ea quoque scalpello radenda est, donec integrum id sit, quod relinquatur; deinde sive os sive cartilago rasa est, nitro bene trito respergendum est: neque alia facienda sunt, ubi caries nigritiesve in summo osse est: siquidem id vel paulo diutius eodem ferramento adurendum, vel radendum 3 est. Qui radit haec, audacter imprimere ferramentum debet, ut et agat aliquid et maturius desinat. Finis est, cum vel ad album os vel ad solidum ventum est. Albo finiri ex nigritie vitium, soliditate quadam

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<sup>a</sup> For VIII. 2-4, cf. Hippocrates III. 16 *et seqq.*, *Head Wounds*, especially VII, VIII, XII, XIV, XVII, XIX; also *Epidemics*, V. 16, 28, 60, 97; VII. 32, 35; *Diseases*, II. 7, 14, 15, 24 (Littre).

heel-bone is without marrow, is hard, and projects somewhat backwards where it presents a rounded outline. The other bones of the feet are constructed in a similar way to the bones of the hand; the sole corresponds to the palm, digits to digits, nails to nails.<sup>a</sup>

2. Now when any bone has been injured, it either becomes diseased or splits or is broken or perforated or crushed or displaced.

A diseased bone generally first becomes fatty, next either blackened or rotten; and this occurs in cases of severe ulceration or fistula, when these have become chronic or even gangrenous. And it is necessary in the first place to expose the diseased bone by cutting out the ulcer, and if the bone disease extends beyond the margins of the ulcer to cut away the flesh until sound bone is exposed all round. Then if the diseased bone appears merely fatty, it is enough to apply a cauterly once or twice until a scale of bone comes away; or to scrape it away until there is bleeding, which is a sign of sound bone; for diseased bone is necessarily dry. The same is also to be done for diseased cartilage: it too must be scraped away with a scalpel until what remains is sound. Then, whether bone or cartilage has been scraped, finely powdered soda must be dusted on; and nothing different is to be done when the surface of the bone is black or carious, except that the treatment by cauterly or scraping must be continued for a longer time. In these cases if the surgeon scrapes he should press boldly upon the instrument that he may effect more and finish sooner. The end is when white or hard bone is reached. White bone instead of black or hard

ex carie manifestum est; accedere etiam cruoris aliquid integro supra (2) dictum est.

Si quando autem an altius descenderit utrumlibet, dubium est, in carie quidem expedita cognitio est. Specillum tenue in foramina demittitur, quod magis minusve intrando vel in summo cariem esse vel altius  
4 descendisse testatur. Nigrities colligi quidem potest etiam ex dolore et ex febre; quae ubi mediocria sunt, illa alte descendisse non potest. Manifestior tamen adacta terebra fit: nam finis vitii est, ubi scobis nigra esse desit.

Igitur si caries alte descendit, per terebram os pungendum crebris foraminibus est, quae altitudine vitium aequent; tum in ea foramina demittenda candentia ferramenta sunt, donec id siccum os ex toto fiat. Simul enim post haec et solvetur ab inferiore osse, quodcumque vitiatum est, et is sinus carne replebitur, etumor aut nullus postea feretur aut mediocris.

5 Sin autem nigrities [est] aut si caries ad alteram quoque partem ossis transit, oportet excidi; atque idem in † carie quoque ad alteram partem ossis penetrante fieri potest.<sup>1</sup> Sed quod totum vitiatum est, totum eximendum est: si inferior pars integra est, eatenus, quod corruptum est, excidi debet. Item, sive capitis sive pectoris os sive costa cariota est, inutilis ustio est, et excidendi necessitas est. Neque audiendi sunt qui osse nudato diem tertium

<sup>1</sup> atque . . . potest *is cut out by Morgagni, as it is a repetition of the last sentence; Marx thinks that carie is a corruption of cancro.*

bone instead of carious clearly indicates the end of the diseased part. I have already stated that sound bone also bleeds to some extent.

But if in either case it is doubtful how deep the disease has reached, in the case of carious bone, this is readily ascertained. A fine probe is introduced into the hole, and according as it enters to a less or greater extent, it shows either that the caries is superficial or that it has penetrated more deeply. With black bone it is possible to form some opinion also from the pain and fever; when these are moderate in degree, the disease cannot have penetrated deeply. This becomes more obvious, however, when a trepan is used; for the limit of the disease is reached when the bone dust ceases to be black.

Therefore, if caries has penetrated deeply, by means of the trepan holes are bored in the bone at frequent intervals, equal in depth to the extent of the disease; next cauterizing points are passed into these holes, until the bone becomes entirely dry. For after such applications, simultaneously the diseased part separates off from the bone underneath, and the cavity will make flesh, and no humour or very little will be subsequently discharged.

If on the other hand the disease, whether blackness or caries, has extended to the other side of the bone as well, excision is required; and the same can be done when caries has penetrated right through a bone. But whatever is wholly diseased is to be wholly removed; if the lower part is sound, only that which is corrupt should be excised. Further, if there is caries of the skull or breast-bone or rib, the cauterizing is useless, and excision is necessary. Nor are we to listen to those who await the third

## CELSUS

expectant, ut tum excidant: ante inflammationem enim tutius omnia tractantur. Itaque, quantum fieri potest, eodem momento et cutis incidenda est, et os detegendum et omni vitio liberandum est. Longeque perniciosissimum est, quod in osse pectoris est, quia vix, etiam si recte cessit curatio, veram sanitatem reddit.

3. Exciditur vero os duobus modis: si parvulum est, quod laesum est, modiololo, quam *χοινεικίδα* Graeci vocant; si spatiosius, terebris. Utriusque rationem proponam. Modiolus ferramentum concavum, teres est, imis oris serratum, per quod medium clavus ipse quoque interiore orbe cinctus demittitur. Terebrarum autem duo genera sunt: alterum simile ei, quo fabri utuntur, alterum capituli longioris; quod ab acuto mucrone incipit, dein subito latius fit, atque iterum ab alio principio paulo minus  
2 quam aequaliter sursum procedit. Si vitium in angusto est, quod comprehendere modiolus possit, ille potius aptatur; et, si caries subest, medius clavus in foramen demittitur; si nigrities, angulo scalpri sinus exiguus fit, qui clavom recipiat, ut eo insistente circumactus modiolus delabi non possit; deinde is habena quasi terebra convertitur. Estque quidam premendi modus, ut et foretur et circumagatur; quia si leviter inprimitur, parum proficit; si graviter,  
3 non movetur. Neque alienum est instillare paulum rosae vel lactis, quo magis lubrico circumagatur; quod ipsum tamen, si copiosius est, aciem ferramenti

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<sup>a</sup> The *χοινεικίς* (*χοινικίς*), or crown trephine, still commonly used, was a tube serrated at the edge and with a pin in the centre. The strap was used like the string in spinning a top to make the movement of the instrument as rapid as possible and so diminish the pain for the patient. According

day after the bone has been laid bare before excising; for all cases are treated more safely before the inflammatory reaction. Therefore, whenever possible at the same sitting, the skin is to be incised, and the bone exposed, and freed from all that is diseased. And much the most dangerous case is in the breast-bone, for even if the operation has been successful, complete healing scarcely ever results.

3. Now bone is excised in two ways; if the damaged part is very small, with the modiolus, which the Greeks call *χοινεϊκίς*;<sup>a</sup> if more extensive by means of trepans. I will describe the use of both. The modiolus is a hollow cylindrical iron instrument with its lower edges serrated; in the middle of which is fixed a pin which is itself surrounded by an inner disc. The trepans are of two kinds; one like that used by smiths, the other longer in the blade, which begins in a sharp point, suddenly becomes larger, and again towards the other end becomes even smaller than just above the point. When the disease is so limited that the modiolus can include it, this is more serviceable; and if the bone is carious, the central pin is inserted into the hole; if there is black bone, a small pit is made with the angle of a chisel for the reception of the pin, so that, the pin being fixed, the modiolus when rotated cannot slip; it is then rotated like a trepan by means of a strap. The pressure must be such that it both bores and rotates; for if pressed lightly it makes little advance, if heavily it does not rotate. It is a good plan to drop in a little rose oil or milk, so that it may rotate more smoothly; but if too much is used the keenness of

to Paulus Aegineta (VI. 90) it was not approved in his day, and only the trepan was used.

## CELSUS

hebetat. Ubi iam iter modiolò pressum est, medius clavus educitur, et ille per se agitur; dein cum sanitas inferioris partis scobe cognita est, modiolus removetur. At si latius vitium est quam ut illo  
 4 comprehendatur, terebra res agenda est. Ea foramen fit in ipso fine vitiosi ossis atque integri; deinde alterum non ita longe, tertiumque; donec totus is locus, qui excidendus est, his cavis cinctus sit; atque ibi quoque quatenus terebra agenda sit, scobis significat. Tum excissorius scalper ab altero foramine ad alterum malleolo adactus id, quod inter utrumque medium est, excidit; ac sic ambitus similis ei fit,  
 5 qui in angustiorem orbem modiolò inprimitur. Utrò modo vero id circumductum est, idem excissorius scalper in osse corrupto planissimam quamque testam † laesit,<sup>1</sup> donec integrum os relinquatur. Vix umquam nigrities, interdum caries per totum os perrumpit, maximeque ubi vitiata calvaria est. Id quoque [signi]<sup>2</sup> specillo significatur, quod depressum in id foramen, quod infra solidam sedem habet, [et]  
 6 ob id renitens aliquid invenit, et madens exit. Si pervium invenit, altius descendens inter os et membranam nihil oppositum invenit, educiturque siccum: non quo non subsit aliqua vitiosa sanies, sed quo[niam] ibi ut in latiore sede diffusa sit. Sive autem nigrities, quam terebra detexit, sive caries, quam specillum ostendit, os transit, modioli quidem usus fere supervacuum est, quia latius pateat necesse est, quod tam

<sup>1</sup> *The text as it stands cannot be translated. Marx would read testulam eximat for testam laesit, and this is translated.*

<sup>2</sup> signi del *Targa*, signo specilli *Constantinus*, vitii, *V. d. Linden*, signi specillo *Marx*.

the instrument is blunted. When a way has been cut by the modiolus, the central pin is taken out, and the modiolus worked by itself; then, when the bone dust shows that underlying bone is sound, the modiolus is laid aside. But if disease is too extensive for the modiolus to cover, the operation must be carried out by the trepan. With this a hole is made exactly at the margin of the diseased and sound bone, then not very far off a second, and a third, until the whole area to be excised is ringed round by these holes; and here also the bone dust shows how deep the trepan is to go. Next the excising chisel is driven through from one hole to the other by striking it with a mallet, and cuts out the intervening bone, and so a ring is made like the smaller one cut by the modiolus. And in whichever way the circle has been made, the same excising chisel should cut away from the corrupted bone every scale-like layer until sound bone is left. Black bone hardly ever penetrates the whole thickness of the bone, but caries sometimes does so, and especially when the cranium is diseased. A test of this is also made by means of the probe, which when inserted into a cavity which has solid bone underneath finds some resistance because of this and is wet when it comes up. If it finds a clear way, as it goes deeper between bone and membrane, it encounters no resistance and comes up dry; not because there is no harmful sanies within, but because this is spread over a wider area. If bone is diseased right through, whether it be black bone exposed by the trepan, or caries discovered by a probe, the use of the modiolus is generally out of place, because what goes down so deep must be more widely opened up.

## CELSUS

7 alte processit. Terebra vero ea, quam secundo loco (1) posui, utendum; eaque ne nimis incalescat, subinde in aquam frigidam demittenda est. Sed tum maiore cura agendum est, cum iam aut simplex os dimidium perforatum est, aut in duplici superius: illud spatium ipsum, hoc sanguis significat. Ergo tum lentius ducenda habena suspendendaque manus sinistra est et saepius attollenda, et foraminis altitudo consideranda, ut, quandoque qui perrumpatur, sentiamus, neque periclitemur, ne mucrone cerebri membrana laedatur; ex quo graves inflammationes cum periculo mortis oriuntur. Factis foraminibus, eodem modo media saepta, sed multo circumspectius, excidenda sunt, ne forte angulus scalpri eandem membranam violet; donec fiat aditus, per quem membranae custos inmittatur: meningophylaca Graeci vocant. Lammina aenea est, prima paulum resima, ab exteriori parte levis; quae demissa sic, ut exterior pars eius cerebro propior sit, subinde ei subicitur quod scalpro discutiendum est; ac, si excipit eius angulum, ultra transire non patitur; eoque et audacius et tutius scalprum malleolo medicus subinde ferit, donec undique excisum os eadem lammina levatur, tollique sine ulla noxa cerebri potest. Ubi totum os eiectum est, circumradendae levandae

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<sup>a</sup> VIII. 1. 1.

<sup>b</sup> *μηνιγγοφύλαξ*, "the guardian of the membrane," called *membranae custos*, VIII. 4. 17. The instrument is still used for the same purpose.

Then the trepan which I described second is to be used; and in order that it may not get too hot, it should be dipped repeatedly into cold water. But particular care must be taken when we have bored half through a bone consisting of a single layer,<sup>a</sup> or through the upper layer of a bone of two layers; in the former the actual distance bored, in the latter the appearance of blood is the indication. Therefore the strap is then worked more gently and the left hand held up and moved away more often, and the depth of the borehole is to be examined in order that we may perceive just when the bone is being broken through anywhere, and not run the risk of injuring the cerebral membrane by the point; which causes severe inflammation with danger of death. When boreholes have been made, the intervening partitions are to be excised in the same way but much more carefully, lest the corner of the chisel injure the aforesaid membrane; until a sufficient opening has been made to insert a guard of the membrane which the Greeks call meningophylax.<sup>b</sup> This consists of a plate of bronze, its end slightly concave, smooth on the outer side; this is so inserted that the smooth side is next the brain, and is gradually pushed in under the part where the bone is being cut through by the chisel; and if it is knocked by the corner of the chisel it stops the chisel going further in; and so the surgeon goes on striking the chisel with the mallet more boldly and more safely, until the bone, having been divided all round, is lifted by the same plate, and can be removed without any injury to the brain. When all this bone has been removed, the margins of the opening must be filed down

## CELSUS

- daeque orae sunt, et, si quid scobis membranae insedit, colligendum. Ubi superiore parte sublata relicta inferior est, non orae tantum sed os quoque totum levandum est, ut sine noxa postea cutis increseat, quae aspero osse nascens protinus non  
10 sanitatem, sed novos dolores movet. Patefacto cerebro qua ratione agendum sit, dicam, cum ad fracta ossa venero (4. 8, 9). Si basis aliqua servata est, superinponenda sunt medicamenta non pingua, quae recentibus vulneribus accommodantur; supraque inponenda lana sucida oleo atque aceto madens. Ubi tempus processit, ab ipso osse caro increscit, eaque factum manu sinum complet. Si quod etiam os adustum est, a parte sana recedit, subitque inter integram atque emortuam partem caruncula, quae quod apscessit expellat; eaque fere, quia testa tenuis et angusta est, squama [id est lepis] a Graecis nominatur.
- 11 Potest etiam evenire, ut ex ictu neque findatur os neque perfringatur, sed summum tamen collidatur exaspereturque; quod ubi incidit, radi et levari satis est. Haec quamvis maxime fiunt in capite, tamen ceteris quoque ossibus communia sunt, ut ubicumque idem incidit, eodem remedio sit utendum. At quae fracta, fissa, forata, collisa sunt, quasdam proprias in singulis generibus, quasdam communes in pluribus curationes requirunt; de quibus protinus dicam, initio ab eadem calvaria accepto.

4. Igitur ubi ea percussa, protinus requirendum

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<sup>a</sup> *i.e.* the irregular cancellous bone of the diploe upon the outer aspect of the inner table.

<sup>b</sup> P. 509.

<sup>c</sup> *λεπίς* as in I. 168; II. 173.

smooth, and if any bone dust is sticking to the membrane it is to be removed. When the outer table has been removed, and the inner table left, it is not only the margins but also all the bone <sup>a</sup> which is to be smoothed down, in order that skin may grow over it subsequently without harm; for when it grows over rough bone there is never sound healing, but it causes new pains. What is to be done when the brain is exposed, I will describe when I come to fractures.<sup>b</sup> If some of the inner table has been preserved, medicaments which are not greasy, such as are fitted for recent wounds, are to be applied, and over that, unscoured wool soaked in oil and vinegar. In course of time flesh grows up from the bone and fills up the hollow made by the surgery. Also if any bone has been cauterized it separates from the healthy part, and between the sound and dead bone granulations form to throw off what has separated; and this is usually a thin and small splinter, which the Greeks call a scale.<sup>c</sup>

It may possibly even happen as the result of an injury, that bone, although neither fissured nor fractured, yet has its surface indented and roughened; when this happens scraping and smoothing suffice. These conditions, although mostly occurring in the head, are found also in the other bones, so that whenever the same thing happens the same procedure is to be followed. But for bones which are fractured, fissured, perforated or crushed, some special treatment is required, suited for particular cases, and some general measures which apply to the majority; of these I will proceed to treat, beginning with the said cranium.

4. Therefore after a blow on the head first we

## CELSUS

est, num bilem homo is vomuerit, num oculi eius occaecati sint, num obmutuerit, num per nares auresve sanguis ei fluxerit, num conciderit, num sine sensu quasi dormiens iacuerit: haec enim non nisi osse fracto eveniunt; atque ubi inciderunt, scire licet necessariam sed difficilem curationem esse. Si vero etiam torpor accessit, si mens non constat, si nervorum vel resolutio vel distentio secuta est, verisimile est etiam cerebri membranam esse violatam; 2 eoque in angusto magis spes est. At si nihil horum secutum est, potest etiam dubitari, an os fractum sit; et protinus considerandum est, lapide an ligno an ferro an alio telo percussus sit, et hoc ipso levi an aspero, mediocri an vastiore, vehementer an leviter, quia quo mitior ictus fuit, eo facilius os ei restitisse credibile est. Sed nihil tamen melius est quam certiore id nota explorare. Ergo qua plaga est, demitti specillum oportet, neque nimis tenue neque acutum, ne, cum in quosdam naturales sinus inciderit, opinionem fracti ossis frustra faciat; neque 3 nimis plenum, ne parvulae rimulae fallant. Ubi specillum ad os venit, si nihil nisi leve et lubricum occurrit, integrum id videri potest; si quid asperi est utique qua suturae non sunt, fractum os esse testatur. A suturis se deceptum esse Hippocrates memoriae prodidit, more scilicet magnorum virorum

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<sup>a</sup> This refers especially to Hippocrates, *Epidemics*, V. 27, 28 (Littre), where the case about which he was mistaken is described. Celsus usually includes under the single term *sutura* fissures due to injury (which he sometimes calls *rimae*, VIII. 3. 5 and 16) as well as the natural sutures of the skull:

must enquire whether the patient has had bilious vomiting, whether there has been obscurity of vision, whether he has become speechless, whether he has had bleeding from the nose or ears, whether he fell to the ground, whether he has lain senseless as if asleep; for such signs do not occur unless with fractured bone; and when they are present, we must recognize that treatment is necessary but difficult. If in addition there is also stupor, if the mind wanders, if either paralysis or spasm has followed, it is probable that the cerebral membrane has also been lacerated; and then there is little hope. But if none of these signs follows the injury, it is not even certain whether the bone is broken: and the first thing then to consider is whether he was struck by a stone or club or sword or other weapon, and whether such a weapon was blunt or pointed, medium or heavy, used with much or little force; for the lighter the blow, the more easily we may conclude that the bone has resisted it. But the best plan is to make certain by exploration. Accordingly a probe should be introduced into the wound; it should be neither very fine nor pointed, lest it enter one of the natural sutures and give rise to a false belief in a fracture of bone; neither should it be too thick lest small fissures be missed. When the probe comes into contact with bone, if nothing but what is smooth and slippery is met with, it can be seen that the bone is intact; if any roughness is met with, at least where there are no sutures, it is a sign that the bone is fractured. Hippocrates,<sup>a</sup> with great men's love of truth in great matters, has described how he had

Hippocrates distinguished the former (*ἔδραι*) from the latter (*ράφαί*).

## CELSUS

- 4 et fiduciam magnarum rerum habentium. Nam levia ingenia, quia nihil habent, nihil sibi detrahunt: magno ingenio, multa que nihilo minus habituro, convenit etiam simplex veri [erroris] confessio prae- cipueque in eo ministerio, quod utilitatis causa pos- teris traditur, ne qui decipiantur eadem ratione, qua quis ante deceptus est. Sed haec quidem alioqui memoria magni professoris ut interponeremus effecit.
- 5 Potest autem sutura eo nomine fallere, quia aequae aspera est; ut aliquis hanc esse, etiamsi rima est, existimet eo loco, quo subesse hanc verisimile est. Ergo eo nomine decipi non oportet, sed os deoperire tutissimum. Nam neque utique certa sedes, ut supra (1. 2) posui, suturarum est, et potest idem et naturaliter commissum et ictu fissum esse iuxta
- 6 aliquid fissum habere. Quin aliquando etiam, ubi ictus fuit vehementior, quamvis specillo nihil invenitur, tamen aperire commodius est. Ac si ne tum quidem rima manifesta est, inducendum super os atramentum scriptorium est, deinde scalpro id dera- dendum: nigritiem enim continet, si quid fissum est. Solet etiam evenire, ut altera parte fuerit ictus, et os altera fiderit. Itaque si graviter aliquis per- cussus est, si mala indicia subsecuta sunt, neque ea parte, qua cutis discussa est, rima reperitur, non incommodum est parte altera considerare, num qui locus mollior sit et tumeat, eumque aperire, siquidem
- 7 ibi fissum os reperietur. Nec tamen magno negotio cutis sanescit, etiamsi frustra secta est. Os fractum, nisi si succursum est, gravibus inflammationibus ad-

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<sup>a</sup> VIII. 1. 2.

<sup>b</sup> Indian ink, cf. Hippocrates, *Head Wounds*, XIV. 47.

been deceived by sutures. For shallow minds, because they have nothing, never belittle themselves; such a sincere confession of the truth befits a great mind which will still have many titles to greatness, and especially in performing the task of handing down knowledge for the advantage of posterity, that no one else may be deceived again by what has deceived him. But my regard for the memory of a great teacher has somehow led me into this digression. Now a suture may possibly deceive just because it is rough too; so that although there is really a fissure, yet we may take it to be a suture, where it is likely that there is one. Therefore we must not be deceived just by this; the safest way is to lay bare the bone. For as I have stated above,<sup>a</sup> sutures are not always in the same position, and a natural union of bone and a fissure from injury may coincide, or the fissure may be close by. Therefore sometimes when the blow was severe, although nothing is detected by the probe, it is still best to open the place up. And if even then no fissure is visible, ink<sup>b</sup> is to be applied over the bone, then it is to be scraped with a chisel; for a fissure will retain the blackness. It may even happen that the blow may have been upon one part of the head, and fracture at another. Thus if anyone has been heavily struck and bad signs have followed, and no fissure has been found in the part where the scalp has been wounded, it is worth while to examine whether some other part is softer and swollen, and to lay it open; then perhaps fissured bone may be found there. Even if it be uselessly incised, the scalp heals without much trouble. A fractured bone unless it is treated causes severe inflammations,

## CELSUS

ficit, difficiliusque postea tractatur. Raro sed aliquando tamen evenit, ut os quidem totum integrum maneat, intus vero ex ictu vena aliqua in cerebri membrana rupta aliquid sanguinis mittat, isque ibi concretus magnos dolores moveat, . . . oculos<sup>1</sup> quibusdam obcaecet. Sed fere contra id dolor est et eo loco cute incisa pallidum os reperitur; ideoque id quoque os excidendum est.

8 Quaecumque autem de causa curatio haec necessaria est, si nondum satis cutis patefacta est, latius aperienda est, donec quicquid laesum est in conspectu sit. In quo ipso videndum est, ne quid ex ima membranula, quae sub cute calvariam cingit, super os relinquatur, siquidem ea scalpro terebrive lacerata vehementes febres cum inflammationibus excitat; itaque eam commodius est ex toto ab osse  
9 deduci. Plagam, si ex vulnere est, talem necesse est habeamus, qualem acceperimus: si manu facienda est, ea fere commodissima est, quae duabus transversis lineis litterae X figuram accipit; tum deinde a singulis procedentibus lingulis cutis subsecatur. Inter quae si sanguis fertur, spongia subinde in aceto tincta cohibendus est, occupandusque est obiectis linamentis et caput altius excitandum. Neque id ullum metum, nisi inter musculos qui tempora continent, adfert: sed ibi quoque nihil tutius fit.

10 In omni vero fissio fractove osse protinus antiquiores medici ad ferramenta veniebant, quibus id exciderent: sed multo melius est ante emplastra

<sup>1</sup> *Marx adds aut before oculos.*

and is treated afterwards with greater difficulty. Rarely, but now and then, it happens, however, that whilst the bone remains whole and sound, yet within the skull a blood-vessel in the cerebral membrane has been ruptured by the blow and some blood has escaped, and this having formed a clot, causes great pains, or sometimes obscures vision. But generally the pain is directly over the clot, and when the scalp at that point is incised, the bone is found to be pallid; if so, that bone also is to be cut out.

But for whatever cause this treatment is necessary, if the scalp has not been laid open sufficiently, it must be incised more widely until the injury is well in view. In doing so we must see that none of the fine inner membrane covering the skull, under the scalp, remains over the bone; for whenever this is lacerated by the chisel or trepan it causes severe fevers with inflammations, and so it is better to raise it wholly off the bone. If there is a cut as part of the wound we must take it as it is; if we have to make it, the best incision is generally that which is formed by two lines in the shape of the letter X; next the scalp is raised by cutting under each of the little tongues. When doing this if bleeding takes place it must be checked by the application of a sponge saturated with vinegar from time to time, also it must be absorbed by swabs of dry lint and the head must be raised higher. There need be no anxiety unless it comes from among the muscles covering the temples; but there also this is the safest method of dealing with it.

In every case of a fissured or fractured bone, the older practitioners resorted at once to the instruments for cutting out the fragments. But it is much

## CELSUS

- experiri, quae calvariae causa componuntur. Eorumque aliquod oportet ex aceto mollitum per se super fissum fractumve os inponere; deinde super id aliquanto latius quam vulnus est eodem medicamento inlitum linteolum, et praeterea succidam lanam aceto tinctam; tum vulnus deligare et cotidie resolvere,
- 11 similiterque curare usque ad diem quintum, a sexto die etiam vapore aquae calidae per spongiam fovere, cetera [ex] eadem facere. Quod si caruncula increscere coeperit et febricula aut soluta erit aut brevior et cupiditas cibi reverterit, satisque somni accedet, in eodem medicamento erit perseverandum. Procedente deinde tempore, emolliendum id emplastrum adiecto cerato ex rosa facto, quo facilius carnem producat: nam per se reprimendi vim habet.
- 12 Hac ratione saepe rimae callo quodam implentur estque ea ossis velut cicatrix; et latius fracta ossa, si qua inter se non cohaerebant, eodem callo glutinantur estque id aliquanto melius velamentum cerebro quam caro, quae exciso osse increscit. Si vero sub prima curatione febris intenditur brevesque somni et idem per somnia tumultuosi sunt, ulcus madet neque alitur, et in cervicibus glandulae oriuntur, magni dolores sunt, cibique super haec fastidium increscit, tum demum ad manum scalprumque veniendum est.
- 13 Duo vero sub ictu calvariae pericula sunt, ne vel findatur os vel medium desidat. Si fissum est, possunt orae esse compressae, vel quia altera super

better first to try the plasters which are prepared for the cranium. One of these dissolved in vinegar is to be put upon the fissured or fractured bone by itself; next over this, a little overlapping the wound, lint steeped in the same, and over this unscoured wool sprinkled with vinegar; then the wound is bandaged and the dressing changed daily, and so treated up to the fifth day; on the sixth day also the wound is steamed by means of a sponge, then dressed as before. And if granulation begins, and the feverishness either subsides or lessens, and appetite returns, and there is sufficient sleep, we should persevere with the same applications. Next as time goes on, the plaster is to be softened by the addition of the cerate made with rose oil that it may cause the flesh to grow more readily; for by itself it has a repressant action. Under this treatment fissures are often filled up by some callus which forms a sort of scab in the bone; and if the fragments are more widely separated, any that are not in contact also become fastened together by the same callus, and this is a better covering for the brain than the flesh which grows up after bone has been excised. But if under this first treatment fever becomes intensified and sleep short and disturbed by dreams, while the wound discharges and does not heal, and the glands in the neck on each side swell, and there is great pain, and in addition a growing aversion to food, then at length we must resort to surgery with the chisel.

A blow on the cranium involves two dangers: either a split bone or a depressed fracture. If the bone is split, the edges may remain in close contact, either because one margin overrides the other, or

alteram excessit, vel etiam quia vehementer se rursus commiserunt. Ex quo evenit, utumor ad membranam quidem descendat, exitum vero non habeat ac sic eam iritet et graves inflammationes moveat. At ubi medium desedit, eandem cerebri membranam os urget interdum etiam ex fractura quibusdam velut  
 14 aculeis pungentibus. His ita succurrendum est, ut tamen quam minimum ex osse dematur. Ergo si ora alteri insedit, satis est id quod eminent, plano scalpro excidere; quo sublato iam rima hiat quantum curationi satis est. At si orae inter se conprimuntur, a latere eius interposito digiti spatio terebra foramen faciendum est; ab eoque scalper duabus lineis ad rimam agendus ad similitudinem † c litterae<sup>1</sup> sic, ut vertex eius a foramine, basis a rima sit:  
 15 quod si rima longius patet, ab altero foramine rursus similis sinus fieri debet. Et ita † nihil latens<sup>2</sup> in eo osse cavum est abundeque exitus datur intus laedentibus. Ne si fractum quidem os desedit, totum excidi necesse est. Sed sive totum perfractum est et ab alio ex toto recessit sive circumpositae calvariae inhaeret exigua parte, ab eo, quod naturaliter se  
 16 habet, scalpro dividendum est. Deinde in eo, quod desedit, iuxta rimam, quam fecimus, foramina addenda sunt; si in angusto noxa est, duo; si latius patet, tria; saeptaque eorum excidenda; et tum scalper utrimque ad rimam agendus sic, ut lunatum sinum faciat imaque pars eius intus ad fracturam,

<sup>1</sup> *V. d. Linden's emendation of V for c is translated.*

<sup>2</sup> *The text as it stands is corrupt. Marx would read: et ita nihil nocebit umor descendens quia late patens in eo osse etc., "and so the moisture as it collects will do no harm, because the hollow part in that bone is well opened out, and, etc."*

because they have become closely interlocked again. Hence it follows that humour collects on to the cerebral membrane but has no means of exit, and so irritates it, exciting severe inflammation. But when there is a depressed fracture, the bone presses on the cerebral membrane and sometimes also sharp points like needles from the fractured bone cause irritation. Cases like this require assistance, with as little loss of bone as possible. Therefore if one edge overlies the other, it is sufficient to cut away the overlying edge with a flat chisel; when this is removed a gap is left wide enough for treatment. But when the fractured edges have become interlocked, a hole should be made with a trepan at a finger's breadth to one side; and from this two cuts should be made with the chisel to the fissure, in the form of the letter V, with the apex at the hole and the base at the fissure; but if the fissure is a long one, similar cuts should be made from a second hole. And thus there is no concealed cavity in that bone, and a way out is given freely to all harmful material within. Even when the fractured bone is depressed, it need not all be excised. But whether completely broken off and separated from the rest, or still attached by a small portion to the skull around, the fragment should be separated by the chisel from the sound bone. Next, in the depressed fragment, close to the groove which we have just made, holes are to be bored as well; two when the damage is of small extent, three when larger, and the intervening partitions must be cut through. Next the chisel is to be so used on each side of the said groove, that a crescent-shaped gap is made with its convexity on the side of the fragment, and its horns directed

## CELSUS

- cornua ad os integrum spectent. Dein, si qua labant et ex facili removeri possunt, forfice ad id facta colligenda sunt, maximeque ea, quae acuta mem-  
17 branam infestent. Si id ex facili fieri non potest, subicienda lammina est, quam custodem eius membranae esse proposui (3. 8); ut super, quicquid spinosum est et intus eminent, excidatur; eademque lammina, quicquid deorsum insedit, attollendum. Hoc genus curationis efficit, ut qua parte fracta ossa tamen inhaerent, solidentur; qua parte abrupta sunt, sine ullo tormento sub medicamento tempore excidant; spatiumque inter haec satis illa magnum ad extrahendam saniem relinquatur; plusque in osse propugnaculi cerebrum habeat, quam habiturum fuit  
18 eo exciso. His factis, ea membrana acri aceto respersenda est, ut, sive aliquid sanguinis ex ea profuit, cohibeatur, sive intus concretus cruor remanet, discutiatur. Tum idem medicamentum eodem modo, qui supra (10) positus est, mollium ipsi membranae inponendum est; ceteraque eodem modo faciendae sunt, quae ad linteolum inlitum et lanam succidam pertinent; conlocandusque is loco [in] tepido; curandum cotidie vulnus, bis etiam aestate.
- 19 Quod si membrana per inflammationem intumuerit, infundenda erit rosa tepida; si usque eo tumebit, ut super ossa quoque emineat, coercebit eam bene trita lenticula vel folia vitis contrita, et cum recenti vel buturo vel adipe anserina mixta; cervixque molliri debebit liquido cerato ex irino facto. At si

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<sup>a</sup> P. 500, note *b*.

<sup>b</sup> This condition is called *hernia cerebri*, although actual brain substance is not necessarily included in the swelling, cf. Hippocrates III. 38, 40 (*Head Wounds*, XV. 33, XVII. 14).

towards the intact bone. Then if there are any detached fragments which can be easily removed, they are to be seized with forceps made for the purpose and particularly the pointed fragments which are irritating the membrane. If this cannot be done easily, the plate which I have suggested as a guard of this membrane is to be passed underneath<sup>a</sup> in order that all pointed fragments which project inwards may be cut away over the plate, and any depressed bone is to be raised by means of the same plate. This method of treatment ensures that fragments still attached become consolidated; and detached fragments come away in course of time under the dressing without any pain; and by that treatment there is left a gap in the skull large enough for the extraction of matter; and the brain is better protected by leaving the bone than if it had been excised. After this, that membrane should be sprinkled with strong vinegar, in order that any bleeding from it may be checked, or any collection of clot which remains inside may be broken up. Then the same plaster, softened as described above, should be put on the membrane itself; and the rest of the dressing as before, ointment on lint, and unscoured wool; the patient should be kept in a warm room; the wound dressed daily, even twice a day in summer.

But if the membrane<sup>b</sup> swells up through inflammation, it is to be bathed with tepid rose oil; if it swells so as to project even above the level of the skull, well-ground lentils or crushed vine leaves, mixed either with fresh butter or goose-grease, will control it; and the neck should be anointed with liquid cerate containing iris oil. But if it shall ap-

## CELSUS

parum pura membrana videbitur, par modus eius emplastro et melli miscendus erit, idque super infundendum; eiusque continendi causa unum aut alterum linamentum iniciendum, et super linteolo, cui emplastrum inlitum sit, contegendum. Ubi [plus] pura membrana est, eadem ratione adiciendum emplastro ceratum, ut carnem producat.

- 20 Quod ad abstinentiam vero et primos posterioresque cibos potionesque pertinet, eadem, quae in vulneribus (V. 26. 25) praecepi, servanda sunt, eo magis, quo periculosius haec pars adficitur. Quin etiam, cum iam non solum sustineri sed aliis quoque oportebit, tamen erunt vitanda, quaecumque mandanda sunt; item fumus et quicquid excitat sternumentum. Spem vero certam faciunt membrana mobilis ac sui coloris, caro increscens rubicunda, facilis motus
- 21 maxillae atque cervicis. Mala signa sunt membrana immobilis, nigra vel livida vel aliter coloris corrupti; dementia, acris vomitus, nervorum vel resolutio vel distentio; caro livida, maxillarum rigor atque cervicis. Cetera, quae ad somnum, cibi desiderium, febrem, puris colorem attinent, eadem, quae in ceteris vulneribus, vel salutaria vel mortifera sunt. Ubi bene res cedit, incipit ab ipsa membrana vel si os eo loco duplex est inde quoque caro increscere; eaque id, quod inter ossa vacum est, replet: nonnumquam
- 22 etiam super calvariam excrescit. Quod si incidet, inspergenda squama aeris est, ut id reprimat cohibeatque. Ea carni superdanda, quae ad cicatricem perducant. Omnibusque ea locis commode inducitur excepta frontis ea parte, quae paulum super id est,

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<sup>a</sup> Pp. 89, 91.

pear that the membrane is not clean, equal parts of its special medicament and of honey are to be mixed together and poured on, and to keep this in place one or two pads of lint must be put on, and over all linen upon which some of the medicament has been smeared. When the membrane is clean, a cerate to form flesh is to be added to the medicament and similarly applied.

As regards abstinence and the food and drink at first and later, the same course is to be adopted as I prescribed for wounds,<sup>a</sup> and all the more because the danger is greater when this part is affected. And even when the time has come not only to sustain but also to build up the patient, still anything requiring mastication should be avoided; and also smoke and anything which provokes sneezing. But there is good hope when the membrane is movable and of normal colour, when the flesh growing up is a bright red, and when the jaw and neck move with ease. Bad signs are: the membrane immobile, black or livid or any other unwholesome colour; delirium, acrid vomiting, paralysis or spasm; livid flesh, rigor of jaw and neck. As for other signs—sleep, appetite, fever, colour of the pus—the indications as to recovery or death are the same as in the case of other wounds. When things are going well, flesh grows up from the membrane itself and from the bone as well if it is in two layers, so that the space between the bones becomes filled up; sometimes it even grows out above the skull. If this occurs copper scales are to be dusted on in order to repress and control it. Also applications to induce a scar must be laid on the flesh. And this is readily brought about everywhere except on the forehead a little above the eye-

## CELSUS

quod inter supercilia est: ibi enim vix fieri potest, ut non per omnem aetatem sit exulceratio; quae linteolo medicamentum habente contegendast. Illa utique capite fracto servanda sunt, ut, donec iam valida cicatrix sit, vitentur sol, ventus, frequens balineum, maior vini modus.

5. In naribus vero et os et cartilago frangi solet, et quidem modo adversa, modo a latere. Si adversa ambo fracta sunt alterumve ex iis, nares desidunt, difficulter spiritus trahitur: si a latere os fractum est, is locus cavus est; si cartilago, in alteram partem nares declinantur.

Quicquid in cartilagine incidit, excitanda ea leniter est aut subiecto specillo aut duobus digitis utrimque compressis; deinde in longitudinem implicata linamenta et molli pellicula cincta circumсутaque intus adigenda sunt; aut eodem modo compositum aliquid ex arido penicillo; aut grandis pinna cummi vel fabrili glutine inlita et molli pellicula circumdata,  
2 quae desiderere cartilaginem non sinat. Sed si adversa ea fracta est, aequaliter utraque naris implenda est: si a latere, crassius esse debet ab ea parte, in quam nasus iacet, ab altera tenuius id quod inseritur. Extrinsecus autem circumdanda habena est mollis, media inlita mixtis inter se similia et turis fuligine; eaque ultra aures ducenda et fronti duobus capitibus adglutinanda est: id enim corpori quasi gluten inhaerescit et, cum induruit, nares commode continet.  
3 Sin quod intus inditum est laedit, sicut maxime fit,

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<sup>a</sup> *i.e.* when a wound exposes the frontal sinus. For the frontal sinus see pp. 475 and 495, and for such a wound p. 501.

brows; <sup>a</sup> for there it is almost impossible to avoid a lifelong wound which has to be kept covered by medicated lint. It should be the rule for all cases in which the skull has been fractured, that until the scar is firm, the patient should avoid sun, wind, frequent baths, and the free use of wine.

5.<sup>b</sup> In the nostrils again either the bony or cartilaginous part may be broken, and that either in front, or to one side. If both are broken across, or one of them, the nose sinks in and the breath is drawn through with difficulty; if bone on one side is broken, there is a depression; if cartilage, the nose is bent to the opposite side.

Whatever occurs in the case of the cartilage, it must be gently raised either by passing a probe under it or by compressing with a finger on each side; then a roll of folded linen with thin leather sewn on over it is introduced; or some sort of dry pad similarly shaped; or a large quill smeared with gum or joiner's glue, and wrapped round with soft thin leather, which will prevent the cartilage from sinking in again. But if broken across, both nostrils are to be filled equally; if on one side, the nostril on the side to which the nose is bent should be filled with a thicker roll, the other nostril with a thinner one. Outside also a strap of soft leather, the middle smeared with a mixture of fine flour and incense soot, is applied, and it must be carried back behind the ears and fastened to the forehead by its two ends.<sup>c</sup> The flour and incense when dried sticks to the skin like glue and keeps the nose in place. If what has been inserted causes

<sup>b</sup> For injuries to the nose, cf. Hippocrates III. 264 *et seq.*, 402 (*Joints*, XXXV.-XXXIX., *Mochlikon*, II.).

<sup>c</sup> In order to hold up the tip of the nose.

## CELSUS

ubi interior cartilago perfracta est, excitatae nares eadem tantummodo habena continendae sunt; deinde post quattuordecim dies id ipsum demendum est. Resolvitur autem aqua calida, eaque tum is locus cotidie fovendus.

Sin os fractum est, id quoque digitis in suam sedem reponendum est; atque ubi adversum id 4 ictum est, utraque naris inplenda est; ubi a latere, ea, in quam os impulsum est; inponendumque ceratum, et paulo vehementius deligandum est, quia callus eo loco non ad sanitatem tantummodo, sed etiam ad tumorem increscit. A tertio die fovendum id aqua calida est, tantoque magis, quanto propius esse sanitati debet. Quod si plura erunt fragmenta, nihilo minus extrinsecus singula in suas sedes digitis erunt compellenda; inponendaque extrinsecus eadem habena, et super eam ceratum; 5 neque ultra fascia adhibenda est. At si quod fragmentum undique resolutum cum ceteris non glutinabitur, intelletur quidem ex umore, qui multus ex vulnere feretur, volsella vero extrahetur; finitisque inflammationibus, inponetur aliquod medicamentum ex iis, quae leniter reprimunt.

6 Peius est, ubi aut ossi aut cartilagini fractae cutis quoque vulnus accessit. Id admodum raro fit. Si incidit, illa quidem nihilo minus eadem ratione in suas sedes excitanda sunt: cuti vero superinponendum emplastrum aliquod ex iis, quae recentibus vulneribus accommodata sunt: sed insuper nullo vinculo deligandum est.

irritation, as happens mostly when the septal cartilage inside is fractured, the nostrils are to be raised and kept in place by the strip of leather alone; then this too is removed at the end of a fortnight after loosening with warm water, and afterwards every day the nose should be fomented with the same.

But if the bone is broken, this also is put back into position by the finger; and when the injury is in front, both nostrils are plugged; when on one side, the nostril on the side towards which the bone has been displaced. Cerate is to be applied, and the part bound fairly tightly, because in this position callus grows not only sufficiently to cause union, but even into a tumour. From the third day the nose is to be fomented with hot water, more especially as it begins to unite. Even if there are several fragments, each is to be forced into place by the fingers applied outside, and the strip in the same way is to be put on outside, and a cerate over it, and no additional bandage. But if any fragment has become completely separated and will not unite with the rest, this will be recognized by the fluid which is discharged freely from the lesion; then the fragment should be extracted by means of a forceps; when the inflammatory reaction is at an end, some medicament from among the mild repressants is applied.

The case is worse when there is an external wound as well as a fracture, whether of bone or cartilage. This only occurs rarely. If it does happen, the fragments are to be replaced into position in the same way, while the skin is dressed with one of the plasters suitable for recent wounds; but no bandage must be put over it.

## CELSUS

6. In aure quoque interdum rumpitur cartilago. Quod si incidit, antequam pus oriatur, inponendum glutinans medicamentum est: saepe enim suppurationem prohibet et aurem confirmat. Illud et in hac et in naribus ignorari non oportet, non quidem cartilaginem ipsam glutinari, circa tamen carnem increescere solidarique eum locum.—Itaque si cum cute cartilago rupta est, cutis utrimque suitur.

2 Nunc autem de ea dico, quae cute integra frangitur. In ea vero si iam pus natum est, aperienda altera parte cutis et ipsa cartilago contra lunata plaga excidenda est; deinde utendum est medicamento leniter supprime, quale Lycium est aqua dilutum, donec sanguis fluere desinat; tum inponendum linteolum cum emplastro sic, ut pingue omne vitetur, et a parte posteriore lana mollis auri subicienda est, quae quod est inter hanc et caput compleat; tum ea leniter deliganda est, et a tertio die vapore, ut in naribus posui (5. 4), fovenda. Atque in his quoque generibus abstinentia primi temporis necessaria est, donec inflammatio finiatur.

7. Ab his ad maxillam venturus indicanda quaedam puto communiter ad omnia ossa pertinentia, ne saepius eadem dicenda sint. Omne igitur os modo rectum ut lignum in longitudinem finditur, modo frangitur transversum, interdum oblicum; atque id ipsum nonnumquam retusa habet capita, nonnumquam acuta. Quod genus pessimum est, quia neque

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<sup>a</sup> For injuries to the ear, cf. Hippocrates III. 274, 404 (*Joints*, XL., *Mochlikon*, III.).

<sup>b</sup> This excision of cartilage allowed pus to escape and avoided a visible puckered scar on the ear; such scars mark present-day professional boxers.

6. In the ear<sup>a</sup> also the cartilage is sometimes ruptured. If this happens, before suppuration has supervened, an agglutinating medicament should be put on; for this often prevents suppuration, and cures the ear. As in the case of the nose, it must not be overlooked that the cartilage itself does not agglutinate, but flesh grows round it and so the place becomes consolidated. Hence, if the skin is torn along with rupture of the cartilage, the skin on both sides is to be stitched. But I speak now of a case where the cartilage is broken, but the skin intact. Now in that case if suppuration supervenes, the skin on the other side is to be laid open and a crescent-shaped piece of cartilage cut out beneath;<sup>b</sup> then a mild styptic such as lycium dissolved in water is put on until bleeding ceases; next lint smeared with a plaster without any grease is applied and soft wool to fill the space between the ear and the head; then the ear is lightly bandaged, and from the third day the ear is steamed as in the case of the nose (5. 4). In these kinds of injuries also fasting is necessary at first until inflammation has ceased.

7.<sup>c</sup> As I am going to pass on from the above to the lower jaw I think I ought to point out certain matters pertaining to fractures in general, so as not to have to say the same things too often. Any bone, then, may be split, either in a straight line as a log of wood is cleft lengthwise, or across, sometimes obliquely; and in the latter case, the fractured ends are sometimes blunted, sometimes pointed. The last is the

<sup>c</sup> For fractures and displacements, cf. Hippocrates III. 94 ff. (*Fractures*, 1 ff.); for fractures of the lower jaw, Hippocrates III. 256 ff. (*Joints*, XXXII.-XXXIV.); for union of fractures, Hippocrates III. 112 (*Fractures*, VII.).

## CELSUS

facile committuntur, quae nulli retuso innituntur, et  
carnem vulnerant, interdum nervum quoque aut  
musculum: quin etiam aliquando plura fragmenta  
2 fiunt. Sed in aliis quidem ossibus ex toto saepe  
fragmentum a fragmento recedit: maxillae vero  
semper aliqua parte etiam vexata ossa inter se  
cohaerent. Igitur inprimis digitis duobus utrimque  
prementibus et ab ore et ab cute omnia ossa in  
suam sedem compellenda sunt; deinde, si trans-  
versa maxilla fracta est (sub quo casu fere dens  
super proximum dentem excedit), ubi ea in suam  
sedem conlocata est, duo proximi dentes aut, si hi  
3 labant, posteriores inter se seta deligandi sunt. Id  
in alio genere fracturae supervacuum est, cetera  
eadem facienda sunt: nam linteolum duplex madens  
vino et oleo superiniciendum cum eadem simila et  
eadem turis fuligine est; deinde aut fascea aut  
mollis habena media in longitudinem incisa, ut utrim-  
que mentum complectatur et inde capita eius supra  
4 caput adducta ibi deligentur. Illud quoque ad omnia  
ossa pertinens dictum erit, famem primum esse  
necessariam; deinde a die tertio umidum cibum,  
sublata inflammatione paulo plenior, eumque  
qui carnem alat: vinum per omne tempus esse  
alienum; deinde tertio die resolvi debere, foveri per  
spongiam vapore aquae calidae, eademque quae  
primo fuerunt superdari: idem die quinto fieri et  
donec inflammatio finiatur, quae vel nono die vel  
5 septimo fere solvitur. Ea sublata, rursus ossa esse

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\* Cf. VIII. 5. 2.

worst because two ends are not brought together easily when they have nothing blunt to rest against, and they lacerate the flesh, sometimes also sinews and muscles; indeed sometimes there are several fragments. Now in other bones one fragment often separates from another completely; but in the case of the jaw the pieces of bone even when injured are always in contact with one another at some point. Begin then by applying pressure with the two thumbs in the mouth and two fingers on the skin outside, and force all the fragments into position; next, if the lower jaw has been broken across, in which case generally one tooth stands higher than its neighbour, when it has been put back into position tie together with horsehair the two adjacent teeth, or if these are loose, teeth further away. In other varieties of this fracture, the binding is superfluous, but what follows is the same for all: a double fold of linen soaked in wine and oil is to be put on, smeared with fine flour and incense as before;<sup>a</sup> then over this a bandage or strip of soft leather has a slit made in the middle to enclose the chin on each side and thence the ends are carried to the top of the head and tied there. What follows applies to fractures in general: fasting is a necessity at first; then from the third day a fluid diet, and when the inflammation has subsided a somewhat fuller diet to build up the strength; wine is wrong throughout; then on the third day the bandage is removed, and the part fomented with steam by means of a sponge, and the bandage reapplied as before; the same thing is to be done again on the fifth day and so on until the inflammation has ceased, which is generally by the ninth or the seventh day. The inflammation gone,

## CELSUS

tractanda, ut, si quid fractum loco suo non est, reponatur: neque id esse solvendum, nisi duae partes eius temporis, intra quod quaeque ossa confervent, transierint. Fere vero inter quartum decimum et unum et vicensimum diem sanescunt maxilla, malae, iugulum, pectus, latum os scapularum, costae, spina, coxarum os, tali, calx, manus, planta: inter vicensimum et tricensimum diem crura, brachiaque: inter septimum et vicensimum et quadragensimum umeri et femina. Sed in maxilla illud quoque adiciendum 6 est, quod umidus cibus diu adsumendus est. Atque etiam cum tempus processit, in lagano similibusque aliis perseverandum est neque quicquam edendum<sup>1</sup> *duri*, donec ex toto maxillam callus firmarit; itemque utique primis diebus habendum silentium.

8. 1. Iugulum vero si transversum fractum est, nonnumquam per se rursus recte coit et, nisi movetur, sanari sine vinctura potest: nonnumquam vero, maximeque ubi motum est, elabitur. Fereque id, quod a pectore est,<sup>2</sup> . . . id, quod ab umero est, in posteriorem partem inclinatur. Cuius ea ratio est, quod per se non movetur, sed cum umeri motu consentit<sup>3</sup> . . . itaque eo subsistente sub id umero agitur. Raro vero admodum in priorem partem iugulum inclinatur, adeo ut magni professores numquam se

<sup>1</sup> *The sentence est . . . edendum is omitted by some MSS. and editors, and as it stands must be wrong. Marx adds duri, which is translated.*

<sup>2</sup> *Marx would add in priorem after quod a pectore est, and this is translated.*

<sup>3</sup> *Marx would add: id vero quod a pectore est immobile est, and this is translated.*

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<sup>a</sup> For fractures of the clavicle, cf. Hippocrates III. 230-244 (*Joints*, XIII.-XVI.).

the bones must be examined again, and if the fractured ends are not in place, they are reset; after which the bandaging should not be dispensed with until two-thirds of the time has elapsed which such bones take to unite. Bones generally reunite as follows: between the fourteenth and twenty-first days the lower jaw, cheek-bones, clavicle, sternum, blade-bones, ribs, spine, hip-bone, astragalus, heel-bone, and the bones of the hands and feet; between the twentieth and thirtieth days the bones of the leg and forearm; between the twenty-seventh and fortieth days the upper arm and thigh. But in the case of the lower jaw, there is this addition, that fluid food has to be taken for a longer period. And even after time has elapsed the patient must continue to eat pancakes and such-like, and must not eat anything hard until the formation of callus has rendered the lower jaw quite firm; also, at any rate for the first days, the patient should not speak.

8. Now if the clavicle<sup>a</sup> has been broken across, it sometimes unites correctly by itself, and unless moved can be cured without being bandaged; but sometimes, and especially when it has been moved, it slips out of place. And generally the fragment on the side of the breast is bent forwards, that on the side of the shoulder backwards. The reason is that the bone has no independent movement, but moves with the shoulder, while the part attached to the breast is immovable; therefore while this remains stationary, the shoulder-fragment is displaced below it by the movement of the shoulder. But so seldom does the clavicle<sup>b</sup> incline forwards that great teachers have recorded that they have

<sup>b</sup> That is the pectoral fragment of the clavicle.

## CELSUS

- B vidisse memoriae mandarint. Sed locuples tamen eius rei auctor Hippocrates est. Verum ut dissimilis uterque casus est, sic quaedam dissimilia requirit. Ubi ad scapulas iugulum tendit, simul dextra manu plana propellendus in posteriorem partem umerus est, et illud in priorem adtrahendum. Ubi ad pectus conversum est, ipsum quidem retro dandum, umerus autem in priorem partem adducendus ac si is inferior est, non id, quod a pectore est, deprimendum est, quia immobile est, sed umerus ipse adtollendus erit:
- C at si superior est, id, quod a pectore est, inplendum lana et umerus ad pectus deligandus est. Si acuta fragmenta sunt, incidi contra cutis debet: ex ossibus ea, quae carnem vulnerant, praecidenda, tum retussa ossa committenda sunt. Si quod ab aliqua parte eminet, opponendum ei triplex linteolum est in vino et oleo tinctum. Si plura fragmenta sunt, excipienda sunt ea ex ferula facto canaliculo eodemque intus
- D incerato, ne fascea diducatur; quae iugulo composito circumdanda est saepius potius quam valentius; quod ipsum quoque in omnibus ossibus fractis perpetuum est. A dextro vero iugulo, si id fractum est, ad alam sinistram, a sinistro ad dextram † rursusque<sup>1</sup> sub ala sua fasciari debet. Post haec si iugulum ad scapulas inclinatum est, brachium ad latus; si in partem priorem, ad cervicem deligandum est supinusque homo conlocandus. Cetera

<sup>1</sup> *Marx adds ea porrigi after dextram and os after rursusque.*

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<sup>a</sup> Cf. Hippocrates III. 242 (*Joints*, XV.).

<sup>b</sup> For this meaning of *umerus*, cf. Appendix, p. 598.

<sup>c</sup> The *canaliculus* or gutter-splint (*σωλήν*), made of canes (*ferulae*) was like the rattan cane splint formerly used in India

never seen it. However, the authority of Hippocrates<sup>a</sup> is ample on this matter. But as the two cases are different, so they require different treatment. When the clavicle points towards the blade-bones, the shoulder is to be forced backwards with the palm of the right hand, and simultaneously the clavicle must be brought forwards. When the clavicle has been turned towards the chest it must be directed backwards, and the shoulder is to be drawn forwards, and if the shoulder is lower, the breast-fragment is not to be pressed down, for it is immobile, but the shoulder must be raised. And if the shoulder is higher the breast-fragment is to be covered with wool, and the arm<sup>b</sup> bandaged to the chest. If the fragments have pointed ends, the skin over them should be incised, and the splinters which are injuring the flesh cut off from the bones, after which the blunted ends are to be brought together. If any part of the clavicle projects it should be covered with three layers of linen soaked in wine and oil. If the fragments are numerous, they must be fixed with a gutter-splint<sup>c</sup> made of cane smeared on its inner side with cerate so that it does not slip under the bandage. The turns of the bandage when the clavicle is fixed should be many, rather than tight, and this should be the rule in the case of other fractured bones. If the right clavicle is fractured, the bandage must be carried from it to the left armpit, if the left clavicle, to the right armpit, then back under the armpit of the fractured side. After this, if the clavicle is inclined towards the shoulder-blade, the forearm is bandaged to the side; if it points forwards, the forearm is bandaged to the neck and the patient kept on his back. All the rest of

## CELSUS

eadem facienda, quae supra (7. 4 *seqq.*) comprehensa sunt.

2 Sunt vero plura ossa fere immobilia vel dura vel cartilaginosa, quae vel franguntur vel forantur vel conliduntur vel finduntur, ut malae, pectus, latum os scapularum, costae, spina, coxarum os, tali, calx, B manus, planta. Horum omnium eadem curatio est. Si supra vulnus est, id suis medicamentis nutriendum est; quo sanescente, rimas quoque ossis, aut si quod foramen est, callus implet. Si cutis integra est et os laesum esse ex dolore colligimus, nihil aliud quam quiescendum, inponendumque ceratum est et leniter deligandum, donec sanitate ossis dolor finiatur.

9. 1. Proprie quaedam tamen de costa dicenda sunt; quia iuxta viscera est, gravioribusque periculis is locus expositus est. Haec quoque igitur interdum sic finditur, ut ne summum quidem os sed interior pars eius, quae rara est, laedatur, interdum sic, ut eam totam is casus perruperit. Si tota fracta non est, nec sanguis expuitur nec febricula sequitur, nec quicquam suppurat, nisi admodum raro, nec dolor magnus est: tactu tamen is locus leniter indolescit. B Sed abunde est eadem, quae supra (8. 2) scripta sunt, facere, et a media fascea incipere deligare, ne in alterutram partem haec cutem inclinet. Ab uno vero et vicensimo die, quo utique os esse debet glutinatum, id agendum cibus uberioribus est, ut corpus quam plenissimum fiat, quo melius os vestiatur,

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<sup>a</sup> VIII. 7. 4.

<sup>b</sup> For rib injuries, cf. Hippocrates III. 306 ff. (*Joints*, XLIX, L.).

<sup>c</sup> Sect. 2 B.

the treatment is the same that was described above.<sup>a</sup>

But there are several bones almost immobile whether hard or cartilaginous, which can be either fractured or bored into or crushed or split; such are the cheek-bones, breast-bone, shoulder-blade, ribs, spine, hip, ankle-bones, heel-bone, bones of the palm and sole. All these are treated in a similar way. If there is a wound over the fracture, it is to be dressed with the appropriate medicaments; as the wound heals callus also fills fissures in the bone or any perforation. If the skin is intact and we gather from the pain that the bone is injured, there is nothing else to do but to rest, apply a cerate and a light bandage until the pain is ended by the healing of the bone.

9.<sup>b</sup> There is, however, something special to be said of the rib, because it is near the viscera, and that region is exposed to greater danger. A rib then is sometimes split so as not to injure the upper bone, but only the thin structure on its inner side; sometimes it is completely broken across. If the fracture is incomplete, blood is not expectorated, and fever does not follow, nor is there suppuration except very rarely, nor great pain; nevertheless there is some tenderness to touch, but it is quite enough to do what has been described above,<sup>c</sup> and to begin the bandaging from the middle of the bandage that it may not displace the skin to either side. Then after twenty-one days, by which time the bone ought to have formed a firm union, a fuller diet is to be administered in order to fatten the body as much as possible, so as to cover the bone better, for the bone there whilst still tender is

## CELSUS

quod illo loco tenerum adhuc iniuriae sub tenui cute  
C expositum est. Per omne autem tempus curationis  
vitandus clamor, strictior quoque<sup>1</sup> . . ., tumultus, ira,  
motus vehementior corporis, fumus, pulvis, et quic-  
quid vel tussim vel sternumentum movet; ne spiri-  
tum quidem magnopere continere expedit. At si  
tota costa perfracta est, casus asperior est: nam et  
graves inflammationes et febris et suppuratio et  
saepe vitae periculum sequitur: et sanguis spuitur.  
D Ergo, si vires patiuntur, ab eo brachio, quod super  
eam costam est, sanguis mittendus est: si non  
patiuntur, alvus tamen sine ullo acri ducenda est,  
diutiusque inedia pugnandum. Panis vero ante  
septimum diem non adsumendus, sed una sorbitione  
vivendum; inponendumque ei loco ceratum ex lino  
factum, cui cocta quoque resina adiecta sit; aut  
Polyarchi malagma, aut panni ex vino et rosa et  
oleo; superque inponenda lana sucida mollis et duae  
E fasceae a mediis orsae minimeque adstrictae. Multo  
vero magis omnia vitanda, quae supra (C) posui,  
adeo ut ne spiritus quidem saepius movendus sit.  
Quod si tussis infestabit, potio sumenda erit vel ex  
trixagine vel ex ruta vel ex [herba] stoechade vel  
ex cumino et pipere. Gravioribus vero doloribus  
urgentibus cataplasma inponi quoque conveniet vel  
ex lolio vel ex hordeo, cui pinguis fici tertia pars sit  
adiecta; et id quidem interdium superiacebit: noctu  
vero idem aut ceratum aut malagma aut panni, quia  
F potest cataplasma decidere. Ergo cottidie quoque  
resolvetur, donec iam cerato aut malagmate pos-

<sup>1</sup> *Marx adds vox after quoque.*

liable to injury owing to the thinness of the skin. But during the whole course of recovery the patient must avoid shouting or even straining the voice, noise, anger, violent bodily movements, smoke, dust, and anything that causes a cough or sneeze; it is not even advisable to hold the breath for long. But if a rib has been broken right across the case is more severe; for grave inflammations follow and fever and suppuration and often danger to life: and blood is expectorated. If therefore the strength allows, blood should be let from the arm on the side of the injury; if strength does not allow of this the trouble is, however, to be countered by a clyster that will not irritate, and by a low diet for a long while. Bread is not allowed before the seventh day, but only broth; and locally a cerate is to be applied made of linseed, to which boiled resin is added; or the poultice of Polyarchus,<sup>a</sup> or cloths soaked in wine, rose oil and olive oil; and over that soft undressed wool, then two bandages beginning from the middle and loosely bound on. But it is more important to avoid all the things mentioned above, so much so that even breathing should not be hurried. If cough is persistent, a draught of germander or rue or French lavender<sup>b</sup> or of cumin and pepper should be taken. But if more severe pain comes on a plaster of darnel or of barley meal is also to be applied, to which is added a third of a ripe fig; and this will lie upon the place by day; but at night, as the plaster may become displaced, use the same cerate or poultice or cloths as above. Therefore too the dressing must be taken off every day until we find the cerate or poultice suffi-

<sup>b</sup> So called because it came from the islands of Hyères (Στοιχάδες).

## CELSUS

- sumus esse contenti. Et decem quidem diebus extenuabitur fame corpus, ab undecimo vero alii incipiet; ideoque etiam laxior quam primo fascia circumligabitur; fereque ea curatio ad quadragesimum diem perveniet. Quod si metus erit suppurationis, plus malagma quam ceratum ad digerendum G proficiet. Si suppuratio vicerit, neque per quae supra scripta sunt discuti potuerit, omnis mora vitanda erit, ne os infra vitietur: sed qua parte maxime tumebit, demittendum erit candens fermentum, donec ad pus perveniat; idque effundendum. Si nusquam caput se ostendet, ubi maxime pus subsit, sic intellegimus: creta Cimolia totum locum inlinemus et siccare patiemur: quo loco maxime umor in ea perseverabit, ibi pus proximum erit H eaque uri debet. Si latius aliquid abscedet, duobus aut tribus locis erit perforandum. Demittendum erit linamentum aut aliquid ex penicillo, quod summum lino sit devinctum, ut facile educatur. Reliqua eadem, quae in ceteris adustis, facienda sunt. Ubi purum erit ulcus, aliud corpus debet, ne tabes pernicioosa futura id malum subsequatur. Nonnumquam etiam levius ipso osse adfecto et inter initia neglecto, non pus sed umor quidam muccis similis intus coit, mollescitque contra cutis; in qua simili ustione utendum est.
- 2 In spina quoque est quod proprie notemus. Nam si id, quod ex vertebra excedit, aliquo modo fractum est, locus quidem concavus fit, punctiones autem in

<sup>a</sup> II. 154, note.

<sup>b</sup> Celsus definitely omitted as too dangerous an operation the methods of forcibly reducing spinal dislocation described in detail by Hippocrates III. 278 ff., 434 (*Joints*, XLI.-XLVIII., *Mochlikon*, XXXVI A, XXXVII A). Modern treatment follows the milder methods described by Celsus here and in chapter 14, rather than those of Hippocrates.

cient. And for ten days the patient may be thinned down by hunger, from the eleventh day he may begin nourishing food; and with that the bandages may be applied round even more loosely than at first; and generally this treatment will continue till the fortieth day. But if there is danger of suppuration, the poultice will be more likely to disperse it than the cerate. If the suppuration gains way, and the treatment above described fails to disperse it, there must be no delay lest the bone underneath become diseased; but where there is most swelling, the red-hot cautery is to be applied until it reaches pus; and that is to be let out. When no pointing of the swelling is evident, we may learn where the pus is chiefly deposited as follows. We smear the whole region with pipe-clay and allow it to dry; the spot where it remains moist the longest marks the neighbourhood of the pus, and there the cautery should be applied. If the suppuration is widely spread, two or three places must be perforated by the cautery. We should then introduce a strip of linen, or some kind of tent<sup>a</sup> bound round with a thread so that it can be easily withdrawn. The rest of the treatment is as in other cauterizations. When the ulceration has cleaned, then the patient should be well fed, lest this disease be followed by what may become fatal wasting. Sometimes even when the bone has been only slightly affected but neglected at first, not pus but a humour somewhat like mucus collects within, and there is a softening under the skin; here also the cautery is to be used.

About the spine there is also something special to note.<sup>b</sup> For if a spinal process has in any way been fractured, there is a depression at that spot, also

## CELSUS

eo sentiuntur, quia necesse est ea fragmenta spinosa esse; quo fit, ut homo in interiorem partem subinde nitatur. Haec noscendae rei [causa] sunt: medicamentis vero isdem opus est, quae prima parte huius capitis (I D *seqq.*) exposita sunt.

10. 1. Similes rursus ex magna parte casus curationesque sunt umeri et femoris: communia etiam quaedam umeris, brachiis, feminibus, cruribus, digitis: siquidem ea minime periculose media franguntur. Quo propior fractura capiti vel superiori vel inferiori est, eo peior est: nam et maiores dolores adfert et difficiliter curatur. Ea maxime tolerabilis est simplex transversa; peior, ubi multa fragmenta atque ubi obliqua; pessimum, ubi eadem acuta sunt.
- B Nonnumquam autem fracta in his ossa in suis sedibus remanent; multo saepius excidunt aliudque super aliud effertur: idque ante omnia considerari debet et sunt notae certae. Si suis sedibus sunt, mota resonant, punctionisque sensum repraesentant; tactu inaequalia sunt. Si vero non adversa sed obliqua iunguntur, quod fit ubi loco suo non sunt, membrum id altero iam erit brevius et musculi eius tument.—
- C Ergo si hoc depresum est, protinus id membrum oportet extendere: nam nervi musculique intenti per ossa contrahuntur neque in suum locum veniunt, nisi illos per vim aliquis intendit. Rursus, si primis diebus id omissum est, inflammatio oritur; sub qua et difficile et periculose vis nervis adhibetur: nam

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<sup>a</sup> Cf. section I D.

<sup>b</sup> For fracture of the long bones (humerus and femur), cf. Hippocrates III. 7, 4 (*Surgery*, XV., XVI.), and for fractures with wounds, cf. Hippocrates III. 148 ff. (*Fractures*, XXIV.-XXXII.).

pricking pains are felt in it, because such fragments are necessarily spiky; this consequently makes the patient lean forwards. These are the signs of the condition; but the same medicaments are required as have been mentioned in the early part of this chapter.<sup>a</sup>

10. Similar again in great part are accidents to the upper arm and thigh and their treatment;<sup>b</sup> there are also some points common to the arms, forearms, thighs, legs and digits, since there is least danger when the middle of the bone is fractured. The nearer the fracture is to either the upper or the lower end the worse it is; for they are at once more painful and more difficult to treat. The least troublesome is the simple transverse fracture; the multiple and the oblique are worse; the worst are those where the fragments are pointed. Now sometimes the fractured bones in these cases remain in their places; but much more often they slip out and overlap each other; this is the first question to be decided, and the signs are unmistakable. If the fragments are in contact, they make a sound when moved and produce a stabbing sensation; they are not level to the touch. But if they are in touch not directly but obliquely, which happens when the fragments are not in their place, that limb will be shorter than the other, and its muscles swell up. Therefore if this has been noted, the limb ought to be stretched at once; for the sinews and muscles which the bones keep on the stretch are contracted, and do not come into their proper place unless someone forces them into position. Moreover if this is not done at first, inflammation sets in; during which it is both difficult and dangerous to employ force to

## CELSUS

distentio nervorum vel cancer sequitur, vel certe, ut mitissime agatur, pus. Itaque si antea reposita ossa non sunt, postea reponenda sunt. Intendere autem digitum vel aliud quodque membrum, si adhuc tenerum est, etiam unus homo potest, cum alteram partem dextra, alteram sinistra prendit: valentius membrum duobus eget, qui in diversa contendunt. Si firmiores nervi sunt, ut in viris robustis maximeque eorum feminibus et cruribus evenit, habenis quoque vel linteis fasceis utrimque capita articulorum deliganda, et per plures in diversa ducenda sunt. Ubi paulo longius quam naturaliter esse debet membrum vis fecit, tum demum ossa manibus in suam sedem compellenda sunt, indiciumque ossis repositi est dolor sublatus et membrum alteri [parti] aequatum. . . .<sup>1</sup> involvendum duplicibus triplicibusve pannis et in vino et oleo tinctis, quos linteos esse commodius est. Fere vero fasceis sex opus est. Prima brevissima adhibenda, quae circa fracturam ter voluta, sursum versum feratur et quasi in cocleam serpat; satisque est eam ter hoc quoque modo circumire. Altera dimidio longior, eaque, si qua parte os eminent, ab ea; si totum aequale est, undelibet super fracturam debet incipere priori adversa deorsumque tendere, atque iterum de fractura reversa in superiore parte ultra priorem fasciam desinere. Super has iniciendum latiore linteo ceratum est, quod eas contineat; ac si qua parte os eminent, triplex ea pannus obiciendus eodem vino et oleo madens. Haec tertia fascia

<sup>1</sup> *Marx supplies* tum id.

the sinews; for either spasm or gangrene follows, or, even if the case goes very favourably, suppuration. Therefore if the fragments have not been replaced before the inflammation, this must be done after. Now a finger or any other limb that is still supple can be stretched by one man alone, when he takes one end with his right, the other with his left hand: a stronger limb requires two men to pull in opposite directions. If the sinews are more resistant, as in powerful men, especially in their thighs and legs, leather straps or linen bands are to be put round each end of the joints, and pulled in opposite directions by several persons. When by force the limb has been made a little longer than it should be, then at length the bones must be pushed back into their place by the hands. A sign of the replacement is that the pain disappears, and the limb becomes equal to the other. Then cloths folded over two or three times and dipped in both wine and oil are wrapped round the part, and it is best for these to be of linen. Generally six bandages are needed. The first, a very short one, is to make three turns over the fracture in the form of a spiral carried upwards; three such turns are sufficient. The second bandage, half as long again, should begin over any projection if there is one; if the bone is quite smooth, it may begin anywhere over the fracture, in an opposite direction to the first bandage, and go downwards, then back over the fracture to end above the first bandage. Over these two bandages is spread a cerate on a broader layer of lint in order to hold the bandages in place; and if at any point bone projects, a triple layer of wool, soaked in wine and oil, is put over it. The foregoing are surrounded by

## CELSUS

comprehendenda sunt, quartaque sic, ut semper insequens priori adversa sit, et tertia tantum inferiore parte, tres in superiore finiantur. Atque satius est saepius circuire quam adstringi: siquidem id, quod adstrictum est, alienatur et canero oportunum est: articulum autem quam minime vincire opus est, sed si iuxta hunc os fractum est, necesse est.

H Deligatum vero membrum in diem tertium continendum est; eaque vinctura talis esse debet, ut primo die nihil offenderit, non tamen laxa visa sit, secundo laxior, tertio iam paene resoluta. Ergo tum rursus id membrum deligandum, adiciendaque prioribus quinta fascia est: iterumque quinto die resolvendum est, et sex fasceis involvendum sic, ut tertia et quinta infra, ceterae supra finiantur. Quotiescumque autem solvitur membrum, calida aqua fovendum.

I Sed si iuxta articulum fractura est, † die<sup>1</sup> instillandum vinum est, exigua parte olei adiecta, eademque omnia facienda, donec adeo inflammatio solvatur vel tenuius quoque quam ex consuetudine id membrum fiat. Quod si septimus dies non dedit, certe nonus exhibet; tum facillime ossa tractantur. Rursus ergo si parum eommissa sunt, committi debent: si qua fragmenta eminent, in suas sedes reponenda

K sunt; deinde eodem modo membrum deligandum, ferulaeque super adcommodandae sunt, quae fixae circumpositaeque ossa in sua sede contineant; et in quam partem fractura inclinat, ab ea latior valentiorque ferula inponenda est. Easque omnes contra

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<sup>1</sup> *Marx reads subinde for die, and this is translated.*

<sup>a</sup> *i.e.* first, second and fourth.

a third bandage, and then by a fourth, the turns always following a direction the reverse of the bandage underneath. The third bandage ends below, the other three<sup>a</sup> above the fracture. It is better to make the turns of the bandage numerous rather than tight, for a part which is constricted is damaged and disposed to gangrene; now a joint should be bandaged as little as possible, but this is necessary if the bone is fractured close to it. The limb should be kept bandaged until the third day: and it ought to be so bandaged that on the first day, whilst it does not hurt, yet it should not seem to be slack; on the second day it should be slacker, and on the third almost loose. Then the limb must be bandaged again, and a fifth bandage added to the others; on the fifth day the bandaging should be undone, and the limb wrapped in six bandages, put on so that the third and fifth bandages finish below, the others ending above. And, whenever the limb is uncovered, it is to be fomented with hot water. But if the fracture is near a joint, from time to time wine with the addition of a little oil is to be dropped upon it, and the same treatment is continued until the inflammation has subsided or the limb has become even a little smaller than ordinary. This occurs by the seventh, or certainly by the ninth day; then the bones are easily manipulated. Therefore if not yet in place, they should be put back; if any fragments project, they must be pushed back into position; then the limb is to be bandaged as before, and over the fracture splints are arranged above so as to hold the fragments firmly in position; and the broader and stronger splint is put on the side to which the fractured ends tend to deviate. All these

## CELSUS

articulum esse oportet resimas, ne hunc laedant, nec ultra astringi quam ut ossa contineant; et cum spatio laxentur, tertio quoque die paulum habenis L suis coartari; ac si nulla prurigo, nullus dolor est, sic manere, donec duae partes eius temporis, quo quodque os confervet, compleantur: postea levius aqua calida fovere, quia primo digeri materiam opus est, tum evocari. Ergo cerato quoque liquido id leniter est unguendum, perfricandaque summa cutis est; laxiusque id deligandum est. Tertio quoque die solvendum sic, ut remota calida aqua cetera eadem fiant: tantummodo singulae fasciae, quotiens resolutae fuerint, subtrahantur.

2 Haec communia sunt, illa propria: siquidem umerus fractus non sic ut membrum aliud intenditur, sed homo conlocatur alto sedili, medicus autem humiliore adversus. Una fascia brachium amplexa ex cervice ipsius, qui laesus est, id sustineat; altera ab <sup>1</sup> † altera parte super caput data ibi accipit nodum; tertia vincto imo umero deorsum demittitur, ibi B quoque capitibus eius inter se vinctis. Deinde ab occipitio ipsius minister sub ea fascea, quam secundo loco posui, porrecto, si dexter umerus ducendus est dextro, si sinister sinistro brachio demissum inter femina eius, qui curatur, baculum tenet: medicus super eam fasceam, de qua tertio loco dixi, plantam inicit dextram si sinister, sinistram si dexter umerus

<sup>1</sup> *Marx conjectures alae for altera.*

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<sup>a</sup> VIII. 7. 5.

<sup>b</sup> For fractures of the upper arm (humerus), cf. Hippocrates III. 114, 194 (*Fractures*, VIII., XLVI.); accompanied by a wound, III. 178 (*Fractures*, XXXV., XXXVI.).

splints should all be bent opposite to a joint so as not to injure it, and they should not press more than is requisite to hold the fragments in place; and since after a while they become loose, every third day the straps keeping them in place are tightened; if there is no itching, or pain, they are kept on for two-thirds of the time which it takes for such a fractured bone to unite;<sup>a</sup> after that the part is fomented lightly with hot water, for the diseased matter must be first dissolved, then extracted. For this reason there should also be gentle inunction with liquid cerate, and superficial rubbing; and the bandaging should be looser. Every third day this bandage is removed, and omitting the hot fomentations, the same treatment is carried out. except that at each change there is one bandage less.

The foregoing treatment is general, the following applies to particular fractures. If the upper arm<sup>b</sup> is fractured, extension is not made as in other limbs, but the patient is seated on a high stool, whilst the surgeon faces him on a lower one. One bandage about the patient's neck is to serve as a sling to support the forearm; another is looped under the armpit<sup>c</sup> and is knotted over the head; a third surrounding the lower end of the humerus is carried down and has its ends tied together below. Then an assistant behind the patient stretches out his right forearm through the second loop, if it is the patient's right humerus which is to be extended, his left if it is the left, and grasps a stick placed upright between the patient's thighs. At the same time the surgeon puts his right foot in the third loop I have described, if the left arm is being

<sup>a</sup> Translating Marx's conjecture.

## CELSUS

curatur; simulque alteram fasciam minister attollit, alteram premit medicus; quo fit ut leniter umerus  
C extendatur. Fasceis vero, si medium aut imum os fractum est, brevioribus opus est; si summum, longioribus, ut ab eo sub altera quoque ala per pectus et scapulas porrigantur. Quae . . .<sup>1</sup> Protinus vero brachium, cum deligatur, sic inclinandum est idque efficit, cum ante fascias quoque sic figurandum sit, ne postea suspensum aliter atque cum deligabatur, umerum inclinet. Brachioque suspenso ipse quoque umerus ad latus leniter deligandus est; per quae fit, ut minime moveatur ideoque ossa sic se habeant,  
D ut aliquis composuit. Cum ad ferulas ventum est, extrinsecus esse earum longissimae debent, a lacerto breviores, sub ala brevissimae. Saepiusque eae resolvendae sunt, ubi in vicinia cubiti umerus fractus est, ne ibi nervi rigescant et inutile brachium efficiant. Quotiens solutae sunt, fractura manu continenda, cubitus aqua calida fovendus est et molli cerato perfricandus; ferulaeque vel omnino non inponendae contra eminentia cubiti, vel aliquanto breviores sunt.

3 Ac si brachium fractum est, in primis considerandum est, alterum os an utrumque comminutum sit; non quo alia in eiusmodi casu curatio admovenda

<sup>1</sup> *After quae something has fallen out, which Marx restores: imponendae erunt ubi ossa erunt composita, et brachium ex cervice suspensum ita ut moveri nequeat.*

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<sup>a</sup> Marx adds: "should be put on when the bones have been set, and the forearm hung in a sling from the neck so that it cannot move."

<sup>b</sup> For fractures of the forearm, cf. Hippocrates III. 94 ff. (*Fractures*, I.-VII.). The commonest type is a fracture of the olecranon process by a fall on the point of the elbow; the

treated, his left foot if the right. And at the same time the assistant lifts one loop up while the surgeon presses the other down, the result being that the humerus is gently extended. Now the bandages, if the middle or lower part of the bone is broken, are shorter, but longer for the upper part, so that they may stretch thence under the opposite armpit too, over the chest and blade-bones. And they . . .<sup>a</sup> But from the first the forearm during the bandaging must be flexed thus, and, since it must be put so even before the bandaging, this ensures that it cannot later, when in the sling, bend the upper arm from the position in which it was while being bandaged. And when the forearm is in a sling, the upper arm too is to be loosely bandaged to the side; this causes it to be moved as little as possible, and so the bones keep in the position in which they have been set. When it is the time for applying the splints, the longest should be placed externally, shorter ones over the biceps muscle in front, the shortest under the armpit. And when the fracture is near the elbow joint, the bandage must be taken off more frequently, or the sinews will become fixed, and the forearm rendered useless. Whenever the bandages are removed, the site of the fracture should be held by the hand, the elbow fomented with warm water, and rubbed with liquid cerate. The splints should not be applied at all over the bony points of the elbow, or should be somewhat shorter.

And if the forearm<sup>b</sup> is fractured, the first thing to consider is whether one or both bones are broken; not that a different treatment is to be adopted, but treatment for avoiding fixation of the elbow joint is correctly described by Celsus.

## CELSUS

sit, sed primum, ut valentius extendatur, si utrumque os fractum est, quia necesse est minus nervos contrahi altero osse integro eosque intendente; deinde, ut curiosius omnia in continendis ossibus fiant, si  
B neutrum alteri auxilio est: nam ubi alterum integrum est, plus opis in eo quam in fasciis ferulisque est. Deligari autem brachium debet paulum pollice ad pectus inclinato, siquidem is maxime brachii naturalis habitus: [sit] idque involutum mitella commodissime excipitur, quae latitudine ipsi brachio, perangustis capitibus collo inicitur. Atque ita commode brachium ex cervice suspensum est, idque paulum supra cubiti alterius regionem pendere oportet.

4 <sup>1</sup> . . . Quod si ex summo cubito quid fractum sit, glutinare id vinciendo alienum est: fit enim brachium immobile. Ac si nihil aliud quam dolori occursum est, idem qui fuit eius usus est.

5 In crure aequae ad rem pertinet alterum saltem os integrum manere. Commune vero ei femorique est quod, ubi deligatum est, in canalem coniciendum est. Is canalis et inferiore parte foramina II habere debet, per quae, si quisumor excesserit, descendat; et a planta moram, quae simul et sustineat eam et delabi non patiatur; et a lateribus cava, per quae loris datis morae quaedam crus  
B femurque, ut collocatum est, detineant. Esse etiam is debet a planta, si crus fractum est; circa poplitem,

<sup>1</sup> *Marx notes that chapters are here omitted on fractures of the radius and middle or lower ulna.*

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<sup>a</sup> See Appendix, p. 599, and note *a* on *cubitus*.

<sup>b</sup> For fractures of the leg, cf. Hippocrates III. 120 ff., 164 and 446 (*Fractures*, X.-XVIII., XXX., and *Mochlikon*, XLII.).

first in order that there should be more forcible extension if both bones are fractured, because the tendons necessarily contract less when one bone is unbroken and keeps them on the stretch, secondly that greater care may be taken in setting the bones when the fellow bone affords no aid; for when one bone is intact, it is of more assistance to the other which is fractured than are bandages and splints. Now when applying the bandage to the forearm the thumb should be turned somewhat towards the chest, for this is the most natural position for the forearm; and after applying the bandage to the forearm it is most comfortable placed in a sling, the broader part of which encloses the forearm, whilst its tapering ends are knotted round the neck. And thus the forearm is comfortably slung from the neck, and it should hang a little above the level of the opposite elbow.

. . . But if there is any fracture at the top of the ulna,<sup>a</sup> fixation by a bandage is wrong, for it renders the forearm immobile. And if nothing is done except for the relief of pain, the limb will become as useful as before.

In the case of the leg<sup>b</sup> it is equally important that one bone at least should be sound. One thing is common to fractures of leg and thigh, that after being bandaged the limb is laid in a gutter-splint. This splint should have two holes near the lower end, by which any fluid that has formed may run off; and there should be a stay for the sole of the foot both to support it and stop it from slipping backwards; and at the sides are slots so that when straps are passed through these, a kind of stay holds the leg and thigh as they have been set. If the leg is fractured, the splint should start from the sole; if the

## CELSUS

si femur, usque ad coxam; si iuxta superius caput femoris, sic, ut ipsa quoque ei coxa insit. Neque tamen ignorari oportet, si femur fractum est, fieri brevius, quia numquam in anticum statum revertitur, summisque digitis postea cruris eius insisti: sed multo tamen foedior debilitas est, ubi fortunae negligentia quoque accessit.

6 Digitum satis est ad unum surculum post inflammationem deligari.

7 His proprie ad singula membra pertinentibus, rursus illa communia sunt: primis diebus fames; deinde tum, cum iam increscere callum oportet, liberalius alimentum; longa a vino abstinentia; fomentum aquae calidae, dum inflammatio est, liberale; ubi ea desit, modicum; tum etiam longior ulterioribus ex liquido cerato membris et mollis tamen unctio. Neque protinus exercendum id membrum, sed<sup>1</sup> . . . ad antiquos usus reducendum est.

B Gravius aliquanto est, cum ossis fracturae carnis quoque vulnus accessit, maxumeque si id musculi femoris aut umeri senserunt: nam et inflammationes multo graviores et promptiores caneros habent. Ac femur quidem, si ossa inter se recesserunt, fere praecidi necesse est. Umerus vero quoque in periculum venit, sed facilius conservatur. Quibus periculis etiam magis id expositum, quod iuxta

C ipsos articulos ictum est. Curiosius igitur agendum est, et musculus quidem, per mediam plagam transversus praecidendus; sanguis vero, si parum fluxit, mittendus; corpus inedia extenuandum.

<sup>1</sup> *Adding paulatim after sed.*

thigh, from about the ham up to the hip; if the fracture is near the head of the thigh, the hip should be included as well. It must not be overlooked, however, that if the thigh-bone is fractured it becomes shorter, for it never returns to its former state, and that afterwards the patient treads on the tips of the toes of that leg; but the disablement is much uglier when neglect is added to misfortune.

For a finger, it is enough to bandage it to a single strip of wood when the inflammation is over.

While these instructions are for individual bones, the following are general for all. For the first days fasting; next a more liberal diet as soon as the callus should be forming; abstinence from wine for a long time; free fomentation with hot water while there is inflammation; more sparing when it has subsided, then long continued but gentle inunction with liquid cerate, for the extremities of the fractured limb. And the limb should not be exercised too soon but brought back to its former use gradually.

The case is rather more grave, when there is a flesh wound as well as a fracture, and especially when muscles of the thigh and upper arm are involved: for they are liable to more severe inflammations and also have a greater tendency to gangrene. And in the case of the thigh-bone, if the fragments have separated from one another, amputation is generally necessary. The upper arm also is liable to this danger, but is more easily preserved. And these dangers are greater if the fracture is close to joints. We must therefore act with greater caution, and the muscle crossing the wound should be cut through. If there has been little haemorrhage, blood should be let; the patient

## CELSUS

Ac reliqua quidem membra lentius intendenda, et lenius in iis ossa in suam sedem reponenda sunt: in his vero neque intendi nervos neque ossa tractari satis expedit; ipsique homini permittendum est, ut sic ea collocata habeat, quemadmodum minime  
D laedunt. Omnibus autem his vulneribus inponendum primo linamentum est vino madens, cui rosae paulum admodum adiectum sit, cetera eadem. Deligandaque fascis sunt aliquanto quam vulnus latioribus, laxius scilicet quam si ea plaga non esset: quanto facilius et alienari et occupari cancro vulnus potest . . .<sup>1</sup> numero potius fasciarum id agendum est, ut  
E laxae quoque aequae contineant. Quod in femore umeroque sic fiet, si ossa forte recte concurrerint: sin aliter se habebunt, eatenus circumdari fascia debet, ut inpositum medicamentum contineat. Cetera eadem, quae supra (1 H *seqq.*) scripsi, facienda sunt, praeterquam quod neque ferulis neque canalibus, inter quae vulnus sanescere non potest, sed pluribus tantummodo et latioribus fasceis opus est: ingerendumque subinde in eas est calidum oleum et vinum, magisque in . . .<sup>2</sup> primo fame  
F utendum; . . . est alienum; vulnus calida aqua fovendum, frigusque omni ratione vitandum; et transeundum ad medicamenta, quae puri movendo sunt; maiorque vulneri quam ossi cura agenda: ergo cottidie solvendum nutriendumque est. Inter quae si quod parvulum fragmentum ossis eminent,

<sup>1</sup> *Marx adds*: tanto minus adstringendum est, cf. 1 G.

<sup>2</sup> *Marx adds*: prima inflammatione. Et . . . and inserts vinum after videndum.

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<sup>a</sup> *i.e.* the thigh and upper arm, cf. Hippocrates III. 180 (*Fractures*, XXXVI.).

must be made thin by a low diet. In all other limbs there must be gradual extension and a rather gentle replacement of the bones in position; but in these<sup>a</sup> it is inexpedient to stretch the sinews; nor should the bones be handled; and the patient is to be allowed the posture he finds least painful. Now upon all wounds of this kind there is to be applied first lint soaked in wine to which a little rose oil has been added; the other remedies are as before. The bandages<sup>b</sup> should be somewhat wider than the wound, slacker perhaps than if there is no wound; the more easily a wound can be harmed, and attacked by gangrene, the less tightly it should be bandaged. Rather by having a number of bandages we must arrange that, although loose, they afford equal support. This will be the treatment for the thigh-bone or upper arm if the fragments are in good line; but if they are not so, the bandaging is applied only so far as to keep the medicaments in place. The rest of the treatment is the same as described before<sup>c</sup> except that no cane nor gutter-splints are put on, under which it is impossible for a wound to heal, but only plenty of wide bandages, which likewise are kept well soaked with warm oil and wine, especially in the first inflammation. And the diet at first must be low; wine is improper; the wound is to be fomented with hot water, and chill avoided in every way; and we should pass on to medicaments which induce suppuration, the treatment being directed rather to the wound than to the fracture; consequently the bandage must be removed every day and the wound dressed. In this treatment when a small fragment of

<sup>b</sup> Cf. Hippocrates III. 64 ff. (*Surgery*, VIII.-XII.).

<sup>c</sup> VIII. 10. 4.

## CELSUS

id si retusum est, in suam sedem dandum; si acutum, ante acumen eius, si longius est, praecidendum; si brevius, limandum et utrumque scalpro levandum; G tum ipsum recondendum est. Ac si id manus facere non potest, vulsella, quali fabri utuntur, inicienda est recte se habenti capiti ab ea parte, qua sima est, ut ea parte, qua gibba est, eminens os in suam sedem compellat. Si id maius est membranulisque cingitur, sinere oportet eas sub medicamentis resolvi, idque os, ubi iam nudatum est, abscidere; quod maturius scilicet faciendum est. Potestque ea ratione et os coire et vulnus sanescere, illud suo tempore, hoc prout se habet.

H Nonnumquam etiam in magno vulnere evenit, ut fragmenta quaedam velut emoriantur neque cum ceteris coeant; quod hic quoque ex modo fluentis umoris colligitur. Quo magis necessarium est saepius ulcus resolvere atque nutrire. Sequitur I vero, ut id os per se post aliquot dies excidat. Cum iam misera antea condicio vulneris sit, tamen id interdum manus . . .<sup>1</sup> diutiusque facies. Saepe enim integra cutis osse abrumpitur, protinusque prurigo et dolor oritur. Quae solvere, si accidit, maturius oportet, et fovere aqua per aestatem frigida, per hiemem egelida; deinde ceratum myrteum inponendum. At interdum fractura quibusdam velut aculeis

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<sup>1</sup> *Marx sees a considerable omission, such as: poterit sanare. Quodsi in eiusmodi vulneribus inflammatio dolorque oritur, membrum aqua frigida fovendum, and this is translated.*

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\* Morgagni (*Ep. V.*) discusses this passage. The bone which is in correct position served as a fulcrum against which the forceps was applied as a lever to put back the displaced fragment.

bone projects, if it is blunt, it is pushed back into place; if it is pointed, the projection, if long, is cut off before replacing it; if short, it is filed off; and in either case it is smoothed down with a chisel, and then pushed back. And if this cannot be done with the hand, pinchers,<sup>a</sup> such as smiths use, must be applied on the concave side to the end of the bone which is in a correct position in order that the convex side may force the projecting bone into place. If the projecting fragment is larger, and covered with small membranes, it is best to leave these to be loosened by medicaments, and then to cut off the bone as soon as it is laid bare; of course this is to be done soon. By this method the bones may join and the wound also may heal, the former in due time, the latter as circumstances permit.

It happens also occasionally in the case of a large wound that some fragments die, so to speak, and fail to unite with the rest of the bone; this as usual can be learnt from the character of the discharge. It is then particularly necessary to loosen the bandage and dress the wound more often. It generally happens that after some days such bone comes away by itself. Although the condition of the wound is bad before, nevertheless surgery can sometimes <cure it. But if in wounds of this kind pain and inflammation occur, the limb must be bathed in cold water,> and you will have to do this for some time. For often the sound skin is broken by a fragment of bone, and at once irritation and pain occur. When this happens the wound must be unbandaged at once, and fomented in summer with cold water, in winter with lukewarm water, then the myrtle cerate must be put on. But at times the fracture irritates

## CELSUS

carnem vexat: quo [a] prurigine et punctionibus cognito, aperire id medicus eosque aculeos praecidere necesse habet. Reliqua vero curatio in utroque hoc casu eadem est, quae ubi ictus protinus . . .<sup>1</sup> intulit.

K Puro iam ulcere cibus hic quoque utendum est carnem producentibus. Si brevius adhuc membrum est et ossa loco suo non sunt, eo paxillus tenuis quam levissimi generis inter ea demitti debet sic, ut capite paululum supra ulcus emineat; isque cottidie plenior adigendus est, donec par id membrum alteri fiat; tum paxillus removendus; vulnus sanandum est; cicatrix inducta fovenda frigida aqua est, in qua myrtus, hedera, aliaeve similes verbenac decoctae sint; inlinendumque medicamentum est quod siccet; et magis etiam hic quiescendum, donec id membrum confirmetur.

L Si quando vero ossa non confervuerunt, quia saepe solutum, saepe motum, in aperto deinde curatio est: possunt enim coire . . .<sup>2</sup> Si vetustas occupavit, membrum extendendum est, ut aliquid laedatur: ossa inter se manu dividenda, ut concurrendo exasperentur, ut, si quid pingue est, eradatur totumque id quasi recens fiat, magna tamen cura habita, ne nervi musculive laedantur.

M Tum vino fovendum est, in quo malicorium decoctum sit; inponendumque id ipsum [corium] ovi albo mixtum: tertio die resolvendum fovendumque aqua,

<sup>1</sup> *Marx inserts vulnus.*

<sup>2</sup> *Marx suggests adding facta quiete.*

the flesh by projections like needle-points: as soon as this is known by the itching and pricking, the surgeon is obliged to expose and cut off these points. The rest of the treatment is in either case the same as when a blow caused the wound in the first instance.

When the wound is clean in these cases too food must be given that makes flesh grow. If the limb is still too short, and the bones are not in place, a thin wedge, as smooth as possible, should be inserted between the fractured ends, so that the head of the wedge projects a little out of the wound; every day it is driven inwards a little until by this means the limb becomes like the other; then the wedge is taken out and the wound left to heal; to encourage it to heal the limb is fomented with a cold decoction of myrtle, ivy or similar vervains; a desiccating medicament is smeared on; and special care must be taken to keep the limb at rest until there is firm union.

But if at any time the bones have not united, because they have often been unbandaged and moved about, then the treatment is obvious; keep them still and they may unite. If the fracture is of long standing, the limb is stretched in order to reproduce the injury to some extent; the fractured ends must be separated by manipulation, so that when allowed to come into contact they rub one another; thus any fatty tissue is rubbed off, and the whole thing is like a fresh fracture; great care, however, must be taken that sinews and muscles are not injured. Then the limb is to be fomented with a decoction of pomegranate bark and wine; and this, mixed with white of egg, is used as a dressing; it is changed on the third day, and the

## CELSUS

in qua verbenae, de quibus supra (K) dixi, decoctae sint: quinto die idem faciendum, ferulaeque circumdandae. Cetera et ante et post eadem facienda, quae supra (1 K) scripsi.

N Solent tamen interdum transversa inter se ossa confervere, eoque et brevius membrum et indecorum fit; et si capita acutiora sunt, adsiduae punctiones sentiuntur. Ob quam causam frangi rursus ossa et derigi debent. Id hoc modo fit. Calida aqua multa membrum id fovetur, et ex cerato liquido perfricatur intenditurque. Et inter haec medicus pertractans ossa, ut adhuc tenero callo, manibus ea diducit, compellitque id, quod eminent, in suam sedem; et, si parum valuit, ab ea parte, in quam os se inclinat, ei involutam lana regulam obicit; atque ita deligando adsuescere iterum vetustae sedi cogit. Nonnumquam autem recte quidem ossa coierunt, superincrevit vero nimius O callus, ideoque locus is intumuit. Quod ubi incidit, diu leviterque id membrum perfricandum est ex oleo et sale et nitro, multumque aqua calida salsa fovendum; et inponendum malagma quod digerat, adstrictiusque alligandum; holeribusque et praeterea vomitu utendum, per quae cum carne callus quoque extenuatur. Confertque aliquid eo sinapi quod cum ficu in alterum par membrum inpositum . . .<sup>1</sup> donec id paulum erodat eoque evocet materiam. Ubi his tumor extenuatus est, rursus ad ordinem vitae revertendum est.

<sup>1</sup> *Marx supplies deligatur.*

limb fomented with the decoction of vervains mentioned above; on the fifth day this is repeated and splints placed round it. The rest of the treatment before and after this is the same as described above.

But sometimes the bones unite with one another sideways, and the limb is then shorter and misshapen; and if the ends are at all pointed, sharp prickings are felt. On this account the bones should be re-fractured and put straight. It is done in this way: the limb is fomented freely with hot water, smeared with a liquid cerate, then stretched. And meanwhile the surgeon handles the bones, and as the callus is still soft, separates the ends, and forces the projecting piece into place; and if he is not strong enough to do this, he puts a ruler wrapped in wool over the projecting bone; and by bandaging it like this forces the bone back to its original place. But occasionally, though the fragments are in correct apposition, too much callus develops and there is a swelling over the fracture. When this happens the limb should be gently rubbed for a long while with oil containing salt and soda, and then fomented freely with hot water and salt; and a poultice should be applied as a dispersive, besides firmer bandages; use a diet of green vegetables, and an emetic besides, which reduces the callus together with the flesh. And it is of advantage in this condition to apply mustard mixed with a fig to the corresponding limb until it causes irritation and draws away the diseased matter.<sup>a</sup> When by this means the swelling has been reduced, return is made to the ordinary course of life.

<sup>a</sup> With the idea that the corresponding parts of opposite limbs sympathize.

## CELSUS

11. Ac de fractis quidem ossibus hactenus dictum sit. Moventur autem ea sedibus suis duobus modis: nam modo quae iuncta sunt inter se dehiscunt, ut cum latum scapularum os ab umero recedit, et in brachio radius a cubito, et in crure tibia a sura; interdum [a saltu] calcis os a talo, quod raro tamen fit: modo articuli suis sedibus excidunt. Ante de prioribus dicam.

2 Quorum ubi aliquid incidit, protinus is locus cavus est, depressusque digitus sinum invenit; deinde gravis inflammatio oritur, atque in talis praecipue: siquidem febres quoque et caneros et nervorum vel distentiones vel rigores, qui caput scapulis adnectunt, movere consuevit. Quorum vitandorum causa facienda eadem sunt, quae in ossibus omnibus laesis [aliquid ubi incidit, protinus is locus] proposita sunt (7. 4), ut dolor tumorque per ea tollantur. Nam diducta ossa numquam rursus inter se iunguntur, et ut aliquid decoris eo loco, sic nihil usus amittitur.

3 Maxilla vero et vertebra omnesque articuli, cum validis nervis comprehendantur, excidunt aut vi expulsi, aut aliquo casu nervis vel ruptis vel infirmatis, faciliusque in pueris et adolescentulis quam in robustioribus. Hique elabuntur in priorem . . .<sup>1</sup> in

<sup>1</sup> *Marx would add* : et in posteriorem, in interiorem.

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<sup>a</sup> Chapters 11–24 deal with dislocations. Celsus does not use the technical term *membra luxata* for dislocated limbs, though this is found in earlier and later writers (cf. Cato, *R.R.* 157. 4, and Seneca, *Ep.* 104. 18). *Excidere* is the word generally used by Celsus to describe a dislocation, though *delabi* and *elabi* also occur. *Luxare* is found once in Celsus, cf. VII. 1. 1 and note. For the description of dislocations in

11. So much for the discussion of fractured bones. Turning to dislocations,<sup>a</sup> these are of two kinds: for at times bones which are conjoined gape asunder, as when the shoulder-bone recedes from the clavicle, and, in the forearm, the radius from the ulna, or in the leg the tibia from the fibula; sometimes [after a jump] the heel-bone from the ankle, though this is rare; at times joints slip out of position. I will speak of the former first.

Now when anything of this sort happens, there is a depression at once on the spot, and when the finger is put into this a gap is felt; after this severe inflammation arises, particularly at the ankle; indeed this is often a cause of fevers also and gangrene and spasms of the sinews or rigors, which bend back the head to the shoulder-blade.<sup>b</sup> To avoid these things the same is to be done as was laid down for bone injuries in general,<sup>c</sup> so that pain and swelling may be thereby relieved. For bones so separated never again unite, and even if the appearance of the limb is somewhat impaired its usefulness is not.

Since all joints, including the jawbone and vertebrae, are held in place by strong sinews, they are displaced either by force or after some accident which has ruptured or weakened the sinews, and this occurs more readily in boys and youths, than in the more robust. And these joints slip out

Hippocrates, cf. III. pp. 212, 218, 344, 386 (*Joints*, VIII., IX., LXI., LXXIX.).

<sup>b</sup> Such symptoms, due to a wound infected with tetanus micro-organisms, while not a direct complication of a dislocation, might easily accompany it in cases where there was a wound as well, and were ascribed by Celsus to the dislocation rather than to the wound. Cf. vol. I. p. 376 (IV. 6. 1).

<sup>c</sup> VIII. 7. 4.

## CELSUS

exteriorem partem, quidam omnibus modis, quidam certis. Suntque quaedam communia omnium signa, quaedam propria sunt cuiusque: siquidem semper ea parte est tumor, in quam os prorumpit; ea sinus, 4 a qua recessit. Et haec quidem in omnibus deprenduntur, alia vero in singulis; quae, simul atque de quoque dicam, proponenda erunt. Sed ut excidere omnes articuli [non]<sup>1</sup> possunt, sic non omnes reponuntur. Caput enim numquam . . .<sup>2</sup> compellitur, neque in spina vertebra, neque ea maxilla, quae, utraque parte prolapsa, antequam reponeretur, inflammationem movit. Rursus si qui nervorum vitio prolapsi sunt, compulsi quoque in suas sedes iterum excidunt. Ac quibus in pueritia exciderunt neque repositi sunt, minus quam ceteri 5 crescunt. Omniumque, quae loco suo non sunt, caro emacrescit, magisque in proximo membro quam ulteriore, ut puta, si umerus loco suo non est, maior in eo ipso fit quam in brachio, maior in hoc quam 6 in manu macies. Tum pro sedibus et pro casibus, qui inciderunt, aut maior aut minor usus eius membri relinquitur; quoque in eo plus usus superest, eo minus id extenuatur. Quicquid autem loco suo motum est, ante inflammationem reponendum est: si illa occupavit, dum conquiescat, non laeessendum: ubi finitast, temptandum in iis membris, quae id patiuntur. Multum autem eo confert et corporis 7 et nervorum habitus. Nam si corpus tenue, si humidum est, si nervi infirmi, expeditius os reponitur:

<sup>1</sup> non was deleted by Constantine.

<sup>2</sup> Marx adds: in suam sedem.

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<sup>a</sup> VIII. 13.

<sup>b</sup> Cf. Hippocrates III. 320, 330 (*Joints*, LIII., LVI.).

forwards, backwards, inwards, outwards, some in all directions, some in certain only. And there are some signs which are common to all, some special to each: there is always a swelling in the part into which the bone has ruptured, and a hollow whence the bone has receded. These signs are found in all, but others only in some cases; these I will describe when speaking of each separately. But while it is possible for all joints to slip out, yet not all can be replaced. For the head is never forced back into position,<sup>a</sup> nor is a spinal vertebra, nor a jawbone which has been dislocated forwards on both sides, and has become inflamed before it has been replaced. Again, any joints which have slipped owing to a lesion of their sinews, even when forced back into position slip out again. Also when joints have been dislocated in childhood, and have not been replaced, there is less growth than elsewhere.<sup>b</sup> The flesh of all which are out of place wastes, and in the near more than in the distant part of the limb; for instance, if the upper arm-bone is not in its place, the wasting is more there than in the forearm, more in the forearm than in the hand. Again, according to the site and character of the accidents, more or less use of the limb is retained; and the more use is retained, the less does it waste. Now every dislocation ought to be replaced before there is inflammation; but if this has set in already, the limb is not to be disturbed until after it subsides: only when it has ended should replacement be attempted in the limbs which allow of it. But for this much depends upon the general constitution of the patient and his sinews. For if his body is slender, and humid, if sinews are weak, the bone is readily replaced; but

## CELSUS

sed ut primo facilius excidit, ita postea minus fideliter continetur. Quae contraria his sunt, melius continent: sed id, quod expulsum est, difficulter admittunt.—Oportet autem ipsam inflammationem levare super sucida lana ex aceto inposita: a cibo, si valentioris articuli casus est, triduo, interdum etiam quinque diebus abstinere; bibere aquam calidam, dum sitim finiat; curiosiusque haec facere is ossibus motis, quae validis plenisque musculis continentur: si vero etiam febris accessit, multo 8 magis; deinde ex die quinto fovere aqua calida; remotaque lana ceratum inponere ex cyprino factum, nitro quoque adiecto, donec omnis inflammatio finiatur. Tunc [in]frictionem ei membro adhibere; cibus uti bonis; uti vino modice; iamque ad usus quoque suos id membrum promovere, quia motus ut in dolore pestifer, sic alias saluberimus corpori est. Haec communia sunt, nunc de singulis dicam.

12. Maxilla in priorem partem propellitur, sed modo altera parte, modo utraque. Si altera, in contrariam partem ipsa mentumque inclinatur; dentes paribus non respondent, sed sub is, qui secant, canini sunt. At si utraque, totum mentum in exteriorem partem promovetur; inferioresque dentes longius quam superiores excedunt; intentique 2 super musculi apparent.—Primo quoque tempore autem homo in sedili collocandus est sic, ut minister a posteriore parte caput eius contineat, vel sic, ut

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<sup>a</sup> Dislocations of lower jaw or mandible, Hippocrates III. 252, 256, 404 (*Joints*, XXX., XXXI., *Mochlikon*, IV.). For *maxilla*, cf. Appendix, p. 595, note a.

just as the bone slips out more easily in the first instance, so the replacement is less secure. With an opposite type of constitution the replacement is more lasting but there is more difficulty in restoring that which has been put out of position. The inflammation should be relieved by applying greasy wool saturated with vinegar: there should be abstinence from food, in the case of the stronger joints, for three days, sometimes even for five: warm water is drunk, enough to relieve thirst; this regimen must be followed more strictly after dislocation of bones which are held in place by strong and large muscles; far more strictly indeed if fever supervenes; then after the fifth day there should be hot-water fomentation; when the wool is removed, a cerate must be applied made with cyprus oil with the addition of soda, until all inflammation has ended. Then the limb is to be rubbed, good food given and wine in moderation; and now also the natural use of the limb is to be encouraged; because though movement when it gives pain is harmful, it is otherwise most beneficial to the body. After these generalities, I will now speak of particular cases.

12. The lower<sup>a</sup> jaw is displaced forwards, sometimes on one side, sometimes on both. If on one side, it inclines with the chin to the opposite side, the teeth do not correspond with their fellows, but the canine are under the incisors. But if on both sides, the whole chin is moved forwards, and the lower teeth stick out beyond the upper ones; and the muscles above appear tense. As soon as possible the patient is to be seated on a stool, with an assistant behind holding his head, or with his

## CELSUS

iuxta parietem is sedeat, subiecto inter parietem et caput eius scorteo pulvino duro, eoque caput eius per ministrum urgeatur, quo sit immobilius. Tum medici digiti pollices linteolis vel fasceis, ne delabantur, involuti in os eius coiciendi, ceteri extrinsecus  
3 admovendi sunt. Ubi vehementer maxilla adprehensa est, si una parte procidit, concutiendum mentum et ad guttur adducendum est. Tum simul et caput adprehendendum, et excitato mento maxilla in suam sedem compellenda, et os eius comprimendum est sic, ut omnia paene uno momento  
4 fiant. Sin utraque parte prolapsa est, eadem omnia eadem facienda, sed aequaliter retro maxilla agenda est. Reposito osse, si cum dolore oculorum et cervicis iste casus incidit, ex brachio sanguis mittendus est. Cum omnibus vero, quorum ossa mota sunt, primo liquidior cibus conveniat, tum his praecipue, adeo ut sermo quoque frequenti motu oris per nervos laedat.

13. Caput duobus processibus in duos sinus summae vertebrae demissis super cervicem contineri in prima parte (1. 11, 12) proposui. Hi processus interdum in posteriorem partem excidunt; quo fit, ut, qui nervi sunt sub occipitio, extendantur, mentum pectori adglutinetur, neque bibere is, neque loqui possit, interdum sine voluntate semen emittat; quibus celerrime mors supervenit. Ponendum autem

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<sup>a</sup> VIII. 1. 11, 12, 13. In chapters 13 and 14 Celsus treats of spine displacement, cf. Hippocrates III. 278 *et seqq.*, also 434 (*Joints*, XLI.-XLVIII., *Mochlikon*, XXXVI. a, XXXVII. a).

back against a wall and a hard leather cushion between the wall and the back of his head, against which his head is firmly pushed by the assistant, to keep it from moving. Then the surgeon's thumbs, which have been wrapped round with strips of linen or bandages so that they may not slip, are inserted into the mouth whilst the fingers are applied outside. When the jaw has been grasped firmly, if it has slipped forwards to one side, the chin is to be pressed downwards towards the throat with a jerk. Then simultaneously the head is firmly held, and the chin being raised the jaw is forced back to its place, and the mouth is closed so that all this is done almost with one movement. If it has been dislocated on both sides all the same movements are to be done except that the jaw is forced straight backwards. When the bone is in its place, if the accident has been attended with pain in the eyes and neck, blood is to be let from the arm. For all patients with dislocated bones, a more liquid diet is proper at first, but especially in this case, since even talking, as it causes constant movement of the mouth by means of the sinews, is harmful.

13. As I stated in the first part,<sup>a</sup> the head is held by two processes, inserted into two cups in the highest vertebra. These processes sometimes slip out backwards; with the result that the sinews under the occiput<sup>b</sup> are stretched, and the chin fixed to the chest; the man cannot drink or speak, and sometimes has involuntary emission of semen; upon these symptoms death very quickly supervenes. Now I

<sup>a</sup> For dislocations of shoulder, cf. Hippocrates III. 200 *et seq.*, also 406, and frontispiece (*Joints*, I.-XII., *Mochlikon*, V.).

hoc esse credidi, non quo curatio eius rei ulla sit, sed ut res indicii cognosceretur et non putarent sibi medicum defuisse, si qui sic aliquem perdidissent.

14. Idem casus manet eos, quorum in spina vertebrae exciderunt: id enim non potest fieri, nisi et medulla, quae per medium, et duabus membranulis, quae per duos a lateribus processus feruntur, et nervis qui continent, ruptis. Excidunt autem et in posteriorem partem et in priorem et supra saeptum  
 2 transversum et infra. In utram[que] partem exciderint, a posteriore parte vel tumor vel sinus † donec.<sup>1</sup> Si super saeptum id incidit, manus resolvuntur, vomitus aut nervorum distentio insequitur, spiritus difficulter movetur, dolor urguet et aures obtusae sunt. Si sub saepto, femina resolvuntur, urina subprimitur, interdum etiam sine voluntate prorumpit. Ex eiusmodi casibus, ut tardius quam ex capitis, sic tamen intra triduum homo moritur.  
 3 Nam quod Hippocrates dixit, vertebra in exteriorem partem prolapsa primum hominem collocandum esse et extendendum, tum calce aliquem super ipsum os debere consistere, et id intus inpellere, in iis accipiendum, quae paulum excesserunt, non is, quae toto loco mota sunt. Nonnumquam enim nervorum inbecillitas efficit, ut, quamvis non exciderit vertebra, tantum parvum tamen aut . . .<sup>2</sup> in priorem partem promineat. Id non iugulat: sed ab interiore parte ne contingit quidem † posse:<sup>3</sup> ab exteriore si

<sup>1</sup> *Marx reads indicat for donec.*

<sup>2</sup> *Marx following Targa would insert: in posteriorem aut before in priorem.*

<sup>3</sup> *The text is corrupt. v. d. Linden suggests propelli for posse; Marx following Targa would read after quidem—propellere: ne contingi quidem potest and this is translated.*

thought this condition should be described, not that there is any treatment for it, but that it may be recognized by these indications, and that those who have lost someone in this way may not deem the medical man to have been at fault.

14. The same fate awaits those whose spinal vertebrae have been dislocated; for this cannot happen without rupture of the marrow in the middle of them, and of the two little membranes which pass out between the two processes at the side, and of the sinews which hold them together. But the vertebrae may slip out both backwards and forwards, above the diaphragm or below it. The direction of the displacement is indicated either by a swelling or by a hollow at the back. If it happens above the diaphragm, there is paralysis of the arms, and vomiting or spasm follow, breathing is difficult, pain is severe, and hearing blunted. If below the diaphragm, the lower limbs are paralysed, the urine is suppressed, or sometimes is passed involuntarily. From such accidents the man dies more slowly than when the head is displaced, yet within three days. As for what Hippocrates said, that when a vertebra has been displaced backwards, the man is to be laid on his face, and stretched out, while an assistant presses his heel upon the displaced bone and pushes it inwards, that procedure is only to be adopted when the bone has slipped out a little, not if there is a total displacement. For occasionally weakness of the sinews causes a vertebra, although not displaced, to project a little, either backwards or forwards. This is not a fatal accident, but we cannot press upon a vertebra from within; it cannot even be touched; and if it is pressed upon from outside,

## CELSUS

propulsum est, plerumque iterum redit, nisi, quod admodum rarum est, vis nervis restituta est.

15. Umerus autem modo in alam excidit, modo in partem priorem. Si in alam delapsus est, cubitus recedit a latere; rursum iuxta eiusdem partis aurem cum umero porrigi non potest, longiusque altero id brachium est. At si in priorem partem, summum quidem brachium extenditur, minus tamen quam naturaliter; difficiliusque in priorem partem quam in posteriorem cubitus porrigitur.

2 Igitur si in alam umerus excidit, et vel puerile adhuc est corpus vel molle, certe inbecillius nervis intentum est, satis est conlocare id in sedili; et ex duobus ministris alteri imperare, ut caput lati scapularum ossis leniter redducat, alteri ut brachium extendat: ipsum posteriore parte residentem † renum<sup>1</sup> sub ala eius † coire; simulque et illa os . . . et altera manu brachium eius ad latus impellere.

3 At si vastius corpus nervive robustiores sunt, necessaria est spatula lignea, et quae crassitudinem duorum digitorum habet, longitudine ab ala usque ad digitos pervenit; in qua summa capitulum est rotundum, leniter cavum, ut recipere particulam aliquam ex capite umeri possit. In ea bina foramina tribus locis sunt inter se spatio distantibus, in quae  
4 lora mollia coiciuntur. Eaque spata fascia involuta, quo minus tactu laedat, ad alam brachio derigitur sic, ut caput eius summae alae subiciatur; deinde

<sup>1</sup> *The text here is corrupt. Marx would read alteram manum for renum and coicere for coire; below, he adds susum after os, and his suggestion is translated.*

it generally slips back again, unless, as very rarely happens, the strength of the sinews is renewed.

15. Passing to the humerus,<sup>a</sup> it is sometimes put out into the armpit, sometimes forwards. If it is dislocated into the armpit, the elbow stands out from the side; again, this elbow, together with the upper arm, cannot be raised to the level of the ear on the same side, and that forearm is longer than the other. But if forwards, the upper forearm can be stretched out, but not to its full extent; and it is more difficult to stretch out the elbow forwards than backwards.

So if the upper bone has slipped out into the armpit and the patient is still young or supple, at any rate if the sinews are not very powerful, it is sufficient to have him held on a stool; one of the two assistants is directed to press gently upon the head of the blade-bone, while the other stretches the forearm; then the surgeon seated behind thrusts one hand into the patient's armpit, presses the bone up with this hand, and with the other presses the elbow to the side. But for a more powerful patient, with stronger sinews, a wooden board is required, two fingers thick, and long enough to reach from the armpit to the fingers; the upper end is rounded and slightly hollowed to admit a small part of the head of the humerus. In three places in this, with a space between, are two slots through which soft straps are passed. And this board, covered with bandage to avoid injury by contact, is so applied from the forearm to the armpit, that its upper end is put under the armpit: it is then tied to the limb by its

<sup>a</sup> Here = head of the upper arm-bone. For the various meanings of humerus, cf. Appendix, p. 593, note *b*.

## CELSUS

- loris suis ad brachium deligatur, uno loco paulum infra umeri caput, altero paulum supra cubitum, tertio citra manum; cui rei protinus intervalla 5 II VI quoque foraminum aptata sunt. Sic brachium deligatum super scalae gallinariae gradum traicitur, ita altae, ut consistere homo ipse non possit; simulque in alteram partem corpus demittitur, in alteram brachium intenditur; eoque fit, ut capite ligni caput umeri inpulsum in suam sedem modo cum sono, modo sine hoc compellatur. Multas alias esse rationes scire facile est uno Hippocrate lecto, sed non alia magis usu comprobata est.
- 6 At si in partem priorem umerus excidit, supinus homo collocandus est; fasciaque aut habena media ala circumdanda est, capitaque eius post caput hominis ministro tradenda, brachium alteri; praecipendumque, ut ille habenam, hic brachium extendat. Deinde medicus caput quidem hominis<sup>1</sup> sinistra debet repellere; dextra vero cubitum cum umero attollere et os in suam sedem compellere; faciliusque id in hoc casu quam in priore revertitur.
- 7 Reposito umero lana alae subicienda est; si interiore parte os fuit, ut ei opponatur; si in priore, ut tamen commodius deligetur. Tum fascia primum sub ala obvoluta caput eius debet comprehendere; deinde per pectus ad alteram alam, ab eaque ad scapulas, rursusque ad eiusdem umeri caput tendere;

<sup>1</sup> *Constantine suggests humeri for hominis.*

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<sup>a</sup> For this use of a ladder, cf. Hippocrates, III. 209 (*Joints*, VI.).

straps, one just below the head of the humerus, the second a little above the elbow, the third short of the wrist, to which purpose the two spaces between the six holes are adapted. The limb so fixed is passed over a rung of a poultry ladder <sup>a</sup> at such a height that the patient himself cannot stand firmly; and whilst his body is allowed to sink down to one side, the limb is stretched on the other side; and thus it comes about that the top of the humerus is forced upwards into place by the top of the board, sometimes with, sometimes without a sound. It is easy to learn that there are many other methods by reading Hippocrates alone, but no other has met with more approval in practice.

But if the humerus is put out forwards, the man is laid on his back and a bandage or a leather strap passed under his armpit, the ends of which are handed to one assistant behind the man's head and his forearm to another assistant; and it must be arranged that the former pulls the strap, the latter the forearm. Then the surgeon should thrust back the man's head with his left hand, whilst with his right he raises the elbow together with the upper arm and forces the bone back into place; and reduction is easier in this case than in the previous one.

When the bone has been replaced, the armpit is filled with wool; if the bone had moved backwards, to prevent it from slipping back; if forwards, to make the bandaging more effective. Then the bandage must first pass under the armpit and control the head of the bone, then stretch across the chest under the opposite armpit, next over the shoulder-blades and again back to the head of the same arm-bone,

## CELSUS

saepiusque eadem ratione circumagi, donec bene id teneat. Vincitur hac ratione umerus commodius continetur, si adductus ad latus sic quoque fascia deligatur.

16. In cubito autem tria coire ossa umeri et radii et cubiti ipsius, ex iis, quae prima parte huius voluminis (1. 19) posita sunt, intellegi potuit. Si cubitus, qui adnexus umero est, ab hoc excidit, radius, qui adiunctus est, interdum trahitur, interdum subsistit. In omnes vero quattuor partes excidere cubitus potest: sed si in priorem prolapsus est, extentum brachium est neque recurvatur; si in posteriorem, brachium curvum est neque extenditur, breviusque altero est; interdum febrem vomitumque bilis movet; si in exteriorem interioremve, brachium porrectum est, sed paulum in eam partem, a qua os recessit, recurvatum.—Quicquid incidit, reponendi ratio una est; neque in cubito tantum sed in omnibus quoque membris longis, quae per articulum . . .<sup>1</sup> longa testa iunguntur: utrumque membrum in diversas partes extendere, donec spatium inter ossa liberum sit; tum id os, quod excidit, ab ea parte, in quam prolapsum est, in contrariam impellere. Extendendi tamen alia atque alia genera sunt, prout aut nervi valent, aut ossa huc illucve se dederunt. Ac modo manibus solis utendum est, modo quaedam alia adhibenda. Ergo si in priorem partem cubitus prolapsus est, extendi

<sup>1</sup> *Marx supplies cum.*

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<sup>a</sup> VIII. 1. 19, 20. For dislocations and fracture above the elbow, cf. Hippocrates III. 184 *et seqq.*—244 *et seqq.*, 356, 410

and it is to be carried round several times in the same way until the bone is well held. The bone when bandaged in this way is held in place more comfortably if it is also bandaged close to the side.

16. From what was said at the beginning of this book, it can be understood how the three bones, humerus, radius and ulna, meet together at the elbow.<sup>a</sup> If the ulna which is connected to the upper arm slips away from it, the radius which is joined to the ulna is sometimes dragged with it, sometimes remains in position. The ulna can slip out in all four directions: but if it is dislocated forwards, the forearm is extended and cannot be flexed; if backwards, the forearm is flexed and cannot be extended, and it is shorter than on the opposite side; sometimes this causes fever and bilious vomiting. If the ulna has been dislocated outwards or inwards, the forearm is stretched but a little bent towards the part from which the bone has receded. Whatever has happened, there is one method of treatment which holds good not only for the ulna but also for all long bones which are connected at their articulation by a long head. Each limb is to be pulled in opposite directions until there is a gap between the bones. Then the bone which has fallen out of place is forced into the opposite direction from the position into which it has slipped. The methods of extension, however, are various according to the strength of the sinews, and the direction in which the bones have given way. And sometimes only the hands are used, sometimes other means have to be applied. Thus if the ulna has slipped for-

(*Fractures*, XXXVIII.-XLV.; *Joints*, XVII.-XXV., LXVI.; *Mochlikon*, VII.-XXV.).

## CELSUS

per duos manibus, interdum etiam habenis adiectis, satis est; deinde rotundum aliquid a lacerti parte ponendum est, et super id repente cubitus ad  
4 umerum inpellendus est. At in aliis casibus commodissimum est eadem ratione brachium extendere, quae fracto cubito<sup>1</sup> supra (10. 4) posita est, et tum ossa reponere. Reliqua eadem curatio est, quae in omnibus: celerius tantum et saepius id resolvendum est, multa magis aqua calida fovendum, diutius ex oleo et nitro ac sale perfricandum. In cubito enim celerius quam in ullo alio articulo, sive extra remansit sive intus revertit, callus circumdatur; isque si per quietem increvit, flexus illius postea prohibet.

17. Manus quoque in omnes quattuor partes prolabitur. Si in posteriorem partem excidit, porrigi digiti non possunt; si in priorem, non inclinantur; si in alterutrum latus, manus in contrarium [id est aut ad pollicem aut ad minimum digitum] convertitur. Reponi non difficillime potest. Super durum locum et renitentem ex altera parte intendi manus, altera brachium debet sic, ut prona sit, si in posteriorem partem os excidit; supina,  
2 si in priorem; si in interiorem exterioremve, in latus. Ubi satis nervi diducti sunt, os, quod in alterutrum latus procidit, manibus in contrarium repellendum est. At is, quae in priorem postero-

<sup>1</sup> humero *Constantine*.

<sup>a</sup> VIII. 10. 2 D.

<sup>b</sup> VIII. 10. 4, and note. For the meanings of *cubitus*, cf. p. 599, note *a*, but the use in the two meanings is awkward here; see critical note.

<sup>c</sup> For dislocations and fracture at the wrist and in the hand, cf. Hippocrates, III. 248 *et seqq.* (*Joints*, XXVI.–XXIX.),

wards, extension by two hands, at times aided by straps, is sufficient; then some round object is to be put in front of the biceps <sup>a</sup> and the ulna suddenly flexed over it towards the upper arm. But in other forms of displacement, it is best to stretch the forearm as described above for fracture of the elbow <sup>b</sup> and then to replace the bones. The rest of the treatment is the same as in all other cases; only the dressing must be taken off more quickly and more often and there must be more plentiful fomentations with hot water, and more prolonged rubbing with oil, <sup>c</sup> and salt. For whether the elbow remains out of place or is put back again, callus forms more quickly round it than round any other joint, and if this callus has grown through resting the joint it prevents flexion afterwards.

17. The hand <sup>c</sup> also may be dislocated in all four directions. If it has slipped out backwards, the fingers cannot be stretched out; if forwards, they do not bend; if to either side, the hand is turned in the opposite direction [either towards the thumb or towards the little finger]. It can be replaced without difficulty. The hand, supported on a hard and resistant object, must be stretched one way, the forearm the other, in such a way that the hand is palm downwards if the bone has slipped out backwards, palm upwards if forwards; if the displacement is inwards or outwards, upon the side. When the sinews are sufficiently stretched, the surgeon's hands push back the bone, in the opposite direction to the side to which it has slipped. Where

when accompanied by wounds, Hippocrates III. 354, 356, 388, 414 (*Joints*, LXIV., LXVII., LXXX., *Mochlikon*, XVI., XVII.).

## CELSUS

remve partem lapsa sunt, super inponendum durum aliquid, idque supra prominens os manu urguendum est, per quod vis adiecta facilius id in suam sedem compellit.

18. In palma quoque ossa interdum suis sedibus promoventur, modo in priorem partem, modo in posteriorem: in latus enim moveri paribus ossibus oppositis non possunt. Signum id solum est omniumque commune: tumor ea parte, in quam os venit; ab ea sinus, a qua recessit. Sed sine intentione digito tantummodo bene pressum os in suam sedem revertitur.

19. At in digitis totidem fere casus eademque signa sunt, quae in manibus. Sed in his extendendis non aequae vi opus est, quom et articuli breviores et nervi minus validi sint. Super mensam tantummodo intendi debent, qui vel in priorem vel in posteriorem partem exciderunt; tum ima palma compelli: at id, quod in latus elapsum est, digitis restitui.

20. Cum de his dixerim, de iis quoque, quae in cruribus sunt, videri possum dixisse: siquidem etiam in hoc casu quaedam similitudo est femori et umero, tibiae et cubito, pedi et manui. Quaedam tamen separatim quoque de his dicenda sunt.

2 Femur in omnes quattuor partes promovetur, saepissime in interiorem, deinde in exteriorem, raro admodum in priorem aut posteriorem. Si in interiorem partem prolapsum est, crus longius altero et vatium est: extra enim pes ultimus spectat;

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<sup>a</sup> For dislocations at the hip, cf. Hippocrates III. 312 *et seqq.*, 366, 386, 416 (*Joints*, LI.-LXI., LXX., LXXIX., *Mochlikon*, XX.-XXV.). The four dislocations are now known as: (i) obturator, (ii) dorsal, (iii) pubic, (iv) sciatic.

the dislocation is forwards or backwards, some hard object is placed upon the hand, and pressed on the projecting bone, and by this additional force the bone is more readily pushed back into place.

18. In the palm also bones are sometimes moved from their places, either forwards or backwards; for they cannot move sideways because of the bones on either side. There is but one sign, and that common to all, a swelling over the displacement, a hollow at the spot from which the bone has receded. But without extension the bone is returned into its place simply by firm pressure with a finger.

19. Now the fingers can be dislocated in almost as many ways as the hand and the signs are the same. But in stretching these less force is required, for the joints are shorter and the sinews less strong. They only need to be stretched out on a table, when the dislocation is forwards or backwards; then reduction is made with the palm of the hand; but when the displacement is to one side, by means of the surgeon's fingers.

20. Since I have described the above, I can be held also to have described displacements in the legs: for in this kind of accident also there is some similarity between the thigh and upper arm, between the tibia and ulna, between the foot and the hand. But there are also some special points to note about the legs.

The thigh-bone<sup>a</sup> may be moved out of place in all four directions, oftenest inwards, next outwards, very rarely forwards or backwards. If it has been dislocated inwards, the leg is longer than the other, and is bowed; for the point of the foot looks outwards;

## CELSUS

si in exteriorem, brevius varumque fit, et pes intus inclinatur; calx ingressu terram non contingit, sed planta ima; meliusque id crus superiusque corpus quam in priore casu fert, minusque baculo  
3 eget. Si in priorem, crus extensum est, inclinarique non potest; alteri cruri ad calcem par est: sed ima planta minus in priorem partem inclinatur; dolorque in hoc casu praecipuus est, et maxime urina sup-  
primitur. Ubi cum dolore inflammatio quievit, commode ingrediuntur, totusque eorum pes incedit. Si in posteriorem, extendi non potest crus, breviusque  
4 contingit. Magnum autem femori periculum est, ne vel difficulter reponatur, vel repositum rursus excidat. Quidam iterum semper excidere con-  
tendunt: sed Hippocrates et Diocles et Phylotimus et Nileus et Heraclides Tarentinus, clari admodum auctores, ex toto se restituisse memoriae prodi-  
derunt: neque tot genera machinamentorum quoque ad extendendum in hoc casu femur Hippocrates, Andreas, Nileus, Nymphodorus, Protarchus, Hera-  
clides, quidam quoque faber repperissent, si id frustra esset. Sed ut haec falsa opinio est, sic illud  
5 verum est: cum ibi valentissimi nervi musculique sint, si suum robur habent, vix admittere; si non habent, postea non continere. Temptandum igitur est: et si tenerum membrum est, satis est habena

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<sup>a</sup> Hippocrates III. 366.

if outwards, the leg becomes shorter and knock-kneed, and the foot is inclined inwards; the heel in walking does not touch the ground, but only the extreme end of the sole; the leg in this case supports the rest of the body better and more uprightly than in the other and there is less need for a stick. If forwards, the leg is extended and cannot be bent; as far as the heel the injured leg is the length of the other one, but the extremity of the sole is less bent forward; and in this case there is marked pain, and very often the urine is suppressed. When the inflammation and pain have subsided, the patients walk fairly and the whole of their foot touches the ground. If backwards, the leg cannot be stretched out, and is shorter; when the patient is standing the heel in these cases too cannot touch the ground. But the great danger with regard to the thigh is that it is difficult to replace, or, after replacement, slips again out of position. Some hold that it always does so; but such renowned authorities as Hippocrates<sup>a</sup> and Diocles and Phylotimus and Nileus and Heraclides of Tarentum have related that they had completely restored such cases; nor would Hippocrates, Andreas, Nileus, Nymphodorus, Protarchus, Heraclides, and a certain smith as well, have invented so many sorts of instruments for making extension on the thigh after this accident, if it had all been of no use. But although that opinion is a false one, there is this truth in it: since the ligaments and muscles there are very strong, if they retain their strength they scarcely allow of replacement; if not, they do not keep in place afterwards. Replacement, then, is to be attempted; and if the limb is weak it is sufficient to stretch it by straps, one from the groin,

## CELSUS

altera ab inguine, altera a genu intendi; si validius, melius adducent, qui easdem habenas ad bacula valida deligarint; cumque eorum fustium imas partes oppositae morae obiecerint, superiores ad se  
6 utraque manu traxerint. Etiamnum valentius intenditur membrum super scamnum, cui ab utraque parte axes sunt, ad quos habenae illae deligantur; qui, ut in torcularibus conversi, rumpere quoque, si quis perseveraverit, non solum extendere nervos et musculos possunt. Collocandus autem homo super id scamnum est aut pronus aut supinus aut in latus sic, ut semper ea pars superior sit, in quam os prolapsus est, et ea inferior, a qua recessit.  
7 Nervis extensis, si in priorem partem os venit, rotundum aliquid super inguen ponendum, subitoque super id genu adducendum est eodem modo eademque de causa, qua idem in brachio fit (16. 3): protinusque,  
8 si complicari femur potest, intus est. In ceteris vero casibus, ubi ossa per vim paulum inter se recesserunt, medicus debet id, quod eminent, retro cogere; minister contra inde coxam propellere. Reposito osse, nihil aliud [novi] curatio requirit, quam ut diutius is in lecto detineatur, ne, si motum adhuc nervis laxioribus femur fuerit, rursus erumpat.

21. Genu vero et in exteriorem et interiorem et in posteriorem partem excidere notissimum est. In priorem non prolabi plerique scripserunt; potestque id vero proximum esse, cum inde opposita patella

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<sup>a</sup> Hippocrates III. 372 (*Joints*, LXXII., LXXIII.), and (for the Hippocratic bench), p. 453.

<sup>b</sup> VIII. 16. 3.

<sup>c</sup> For dislocations of the knee, cf. Hippocrates III. 182, 390, 424 (*Fractures*, XXXVII.; *Joints*, LXXXII., *Mochlikon*, XXVI.).

another from the knee; if stronger, the assistants will have more purchase if they have knotted the straps around strong poles; and if after pressing the lower ends of the poles against firm supports, they have drawn the upper ends towards themselves with both hands. Even more forcible pressure can be exerted by stretching the limb over a bench,<sup>a</sup> at either end of which is a windlass to which the straps are attached; when these are rotated as in a winepress, it is possible, by continuing to do this, even to rupture the ligaments and muscles, and not merely to stretch them. Now the patient is to be laid upon this bench, on his face or back or side, so that that part is always the higher into which the bone has slipped, and that from which it has receded the lower. When the sinews have been stretched, if the bone comes forwards, some round object is placed over the groin and the patient's knee must be pulled back over it with a jerk, in the same way and for the same reason for which this was done in the case of the forearm <sup>b</sup>; as soon as the thigh can be bent up, the bone is in place. In the other cases, when the bones under extension have receded a little from each other, the surgeon should force the projecting part back, whilst an assistant presses the hip in the opposite direction. When the bone is replaced nothing further need be done, but the patient must be kept in bed for a rather long time or the thigh may become displaced again on moving while the sinews are still relaxed.

21. It is very well known that the knee <sup>c</sup> is put out externally and internally and backwards. Many have written that it does not slip out forwards; and this may be very near the truth, for the knee-cap

## CELSUS

ipsa quoque caput tibiae contineat. Meges tamen eum, cui in priorem partem excidisset, a se curatum esse memoriae prodidit.—In his casibus intendi nervi rationibus isdem, quas in femore rettuli, possunt. Et id quidem, quod in posteriorem partem excidit, eodem modo, rotundo aliquo super poplitem inposito adductoque eo crure, reconditur. Cetera vero manibus simul, dum ossa in diversas partes . . .<sup>1</sup> compellentur.

22. Talus in omnes partes prolabitur. Ubi in interiorem partem excidit, ima pars pedis in exteriorem partem convertitur; ubi huic contrarius casus, contrarium etiam signum extat. Si in priorem partem erumpit, a posteriore latus nervos durus et insanus est: manaque his opus est: si in posteriorem, calx paene conditur, planta maior fit. 2 Reponitur autem is quoque per manus, prius in diversa pede et crure diductis. Et in hoc quoque casu diutius in lectulo perseverandum est, ne is talus, qui totum corpus sustinet, parum confirmatis nervis ferendo oneri, cedat rursusque prorumpat. Calciamentis quoque humilioribus primo tempore utendum, ne vinctura talum ipsum laedat.

23. Plantae ossa iisdem modis quibus in manu prodeunt, iisdemque conduntur. Fascia tantummodo calcem quoque debet comprehendere, ne,

<sup>1</sup> *Marx would add diducuntur after partes.*

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<sup>a</sup> Probably there was a separation of the lower epiphysis of the femur in a boy, replaced by flexing the knee.

<sup>b</sup> For dislocations and fracture of the ankle and foot, cf. Hippocrates III. 118, 120, 126, 130, 350, 356, 360, 388, 392, 394, 424 (*Fractures*, IX., XI., XIII., XIV.; *Joints*, LXIII.,

is there right in front and holds the head of the tibia in place. Meges, however, has recorded a case in which he replaced a knee which had slipped forwards.<sup>a</sup> In cases affecting the knee-joint the sinews can be extended by the same means as I have described for the thigh. And when it has slipped out backwards, as described above, a round ball of some kind is placed on the ham, and when the leg is bent up over it, the knee slips back again. In the other cases it is to be replaced by the surgeon's hands while the bones are being drawn apart in opposite directions.

22. The ankle<sup>b</sup> can be dislocated in all four directions. When it slips out inwards, the sole of the foot is turned outwards; when outwards, the contrary sign is exhibited. If the ankle is dislocated forwards, the broad sinew behind<sup>c</sup> is hard and tense, and in those cases manipulation is required; if backwards, the heel is almost hidden and the sole is elongated. But this is also replaced by manipulation, the foot and leg first being stretched in opposite directions. And after this kind of accident also, the patient should stay for a long while in bed, lest the ankle, which sustains the whole weight of the body, should give way and again be displaced if the sinews have not gained strength enough for bearing the weight. At first low shoes should be worn, so that the ankle may not be injured by tight lacing.

23. The bones of the sole of the foot may come out like those of the hand, and are set after the same fashion. Only the bandage should also include the

LXVII., LXVIII., LXXX., LXXXIV., LXXXVII., *Mochlikon*, XXVI.-XXXI.).

<sup>c</sup> The tendon of Achilles.

## CELSUS

cum mediam plantam imumque eius vinciri necesse est, liber talus in medio relictus materiam pleniorē recipiat ideoque suppuret.

24. In digitis nihil ultra fieri debet quam quod in iis, qui sunt in manu, positum est (19). Potest tamen conditus articulus medius aut summus canaliculo aliquo contineri. .

25. Haec facienda sunt in iis casibus, ubi sine vulnere ossa exciderunt. . . <sup>1</sup> Hic quoque et ingens periculum est, et eo gravius, quo maius membrum est, quoque validioribus nervis aut musculis continetur. Ideoque in umeris femoribusque metus mortis est: ac, si reposita eis ossa sunt, spes nulla est; si non reposita, tamen nonnullum periculum est; eoque maior in utroque timor est, quo propius vulnus articulo est. Hippocrates nihil tuto reponi posse praeter digitos et plantas et manus dixit, atque in his quoque diligenter esse agendum, ne praecipitent. Quidam brachia quoque et crura reposerunt; et ne cancri distentionesque nervorum orientur, sub quibus in eiusmodi casu fere mors matura est, sanguinem ex brachio miserunt. Verum ne digitus quidem, in quo minimum ut malum, sic etiam periculum est, reponi debet, aut in inflammatione aut postea, cum iam vetus res est. Sic quoque reposito osse nervi ubi distenduntur, rursus id protinus expellendum est. Omne autem membrum, quod cum vulnere loco motum neque repositum est, sic iacere convenit, ut maxime cubantem iuvat;

<sup>1</sup> Marx suggests that something has fallen out, such as: saepe tamen cum vulnere loco moventur, but often there is a wound as well as a dislocation.

heel, in case, when the middle and front part of the sole have to be bandaged, if the ankle is left unbandaged, too much matter should accumulate there, and lead to suppuration.

24. For the toes the same treatment is required as was laid down for the fingers. But the middle or end joint when replaced may be fixed in some kind of gutter splint.<sup>a</sup>

25. This is the treatment for those cases in which no wound accompanies the dislocation. . . . In these cases too there is not only great danger but it is more serious, the larger the limb, and the more powerful the sinews and muscles controlling it. Hence in the case of the shoulder and hip joints there is risk of death: and if the bones are set, there is no hope at all; if not, there is still some danger, and in either case the nearer the wound is to the joint the greater the cause for anxiety. Hippocrates said that no such dislocation could be replaced safely except those of fingers and toes, and feet and hands, and even in these cases it was best not to be in a hurry. Some have also replaced elbows and knees; and have then let blood at the elbow, lest gangrene and spasm<sup>b</sup> should arise, after which generally in such cases an early death follows. Even a finger, in which the damage and therefore the danger is least, ought not to be reset whilst there is inflammation, or indeed at a later stage when the condition is of long standing. Moreover, when after replacement the sinews become tense, the bone should at once be put out again. Where there is a dislocation and a wound as well, the limb which has not been set should lie in the position easiest

<sup>a</sup> VIII. 8. 1 C; 10. 5 A.

<sup>b</sup> IV. 6. 1, note.

## CELSUS

tantum ne moveatur neve dependeat. In omnique tali morbo magnum ex longa fame praesidium est, deinde ex curatione eadem, quae proposita est 5 (10. 7 D), ubi ossibus fractis vulnus accessit. Si nudum os eminent, impedimento semper futurum est: ideo quod excedit abscidendum est, inponendaque super arida linamenta sunt et medicamenta non pinguia, donec quae sola esse in eiusmodi re sanitas potest, veniat: nam et debilitas sequitur et tenuis cicatrix inducitur, quae necesse est facile noxae postea pateat.

to the patient; only it must not be moved or hang downwards. In every disorder of this kind there is great advantage in prolonged abstinence, and then in the treatment described above for fractured bones when there is also a wound.<sup>a</sup> If bare bone projects, it will always be troublesome; hence the projection is to be sawn away and dry lint and medicaments without lard put on, until what is possible in the way of healing for such a case is arrived at; for weakness of the limb follows and the scar that forms is thin, and this of necessity is afterwards readily subject to injury.

• VIII. 10. 7 D.



## APPENDIX I

### ON THE MEANING OF THE WORD "CANCER" IN CELSUS AND HIS REFERENCES TO MALIGNANT DISEASE

UNDER this term Celsus includes several entirely different diseases. The word "canker" has been used in the translation, as the conditions referred to do not, as far as we can judge, include the disease now generally known as cancer.<sup>a</sup>

He includes under this name :

- (1) Septic and foul ulcerations.
- (2) Erysipelas and Ignis Sacer.
- (3) Gangrene.

(1) In Book V. 26. 31 Celsus describes the general characteristics of septic ulcerations.<sup>b</sup> He had noted early in his work that they occur especially in wounds

<sup>a</sup> The descriptions given by Celsus are not very clear and often apply to more than one disease. so that it is not possible to be certain on this point.

<sup>b</sup> The description is confused by the addition of symptoms of erysipelas and gangrene, which no doubt often complicated such cases. These ulcers arose in injuries of long standing (VIII. 2. 1). The Greek name was *σηπεδών* (Hippocrates IV. 126, 128, *Aphorisms* iii. 16, 21).

## APPENDIX 1

which have been exposed to moisture,<sup>a</sup> and in several passages he refers to the situation or treatment of such wounds.<sup>b</sup>

The condition was a combination of the mortification of living tissue and the putrefaction of dead tissue, which is now known to be set up by the united action of septic and gas-forming organisms.

(2) Erysipelas originally meant a redness of the skin due to an eruption or ulceration, and was used with this general meaning in Greek writers on medicine.<sup>c</sup> The term was used of many conditions and had many synonyms. It gradually became restricted to the disease now called erysipelas and proved to be due to streptococcal infection. Celsus gives a clear description of this disease as one of the varieties of cancer and states that the Greek name for it was erysipelas.<sup>d</sup>

Ignis Sacer.<sup>e</sup> This name has often been used simply as an alternative for erysipelas, but Celsus seems to denote by it an erysipelatous complication of a chronic creeping ulceration, such as the tuberculous ulceration now called lupus.<sup>f</sup> Pliny, how-

<sup>a</sup> See V. 26. 28 D (for the danger of bathing, which changes an ordinary wound into "cancer").

<sup>b</sup> Cancer and especially cancer in obscaenis (σηπεδόνες αιδοίων) II. 1. 7; prescriptions for it, V. 20. 4, 5; VI. 18. 3 A and B.

<sup>c</sup> Hippocrates I. LVIII, 240; II. 46; III. 5.

<sup>d</sup> V. 26. 31 B; later he twice refers to this passage and to the treatment for the disease using the name *erysipelas*. (V. 26. 33 A and 28. 11 B).

<sup>e</sup> Virgil (*Georgics*, III. 553-566) describes under this name an epizootic, which also affected human beings, perhaps anthrax.

<sup>f</sup> V. 28. 4. Medicaments for it are prescribed, V. 22. 7 and 24. 4.

## APPENDIX I

ever, gave the name to herpes zoster (shingles).<sup>a</sup> While Celsus described erysipelas under the heading of "cancer," he spoke of ignis sacer as something different.<sup>b</sup>

(3) Gangrene. The general term "cancer" was applied in Latin to several varieties of gangrene, which the Greeks distinguished by different names.<sup>c</sup> It occurred in wounds complicating fractures and dislocations, or as a consequence of too tight bandaging,<sup>d</sup> or as a spreading gangrene (*phagedaena*)<sup>e</sup> which could only be treated by amputation of the limb involved, or in the mouth perhaps as the result of thrush (*aphtha*).<sup>f</sup>

*Malignant Disease.*—Although in a number of

<sup>a</sup> Pliny, *N.H.* XXVI. 121. In this he has been followed by some other writers on medicine, but herpes does not "creep," and is certainly not the disease referred to by Celsus in V. 28. 4.

<sup>b</sup> V. 22. 7. *Timaeus autem ad ignem sacrum, ad cancrum his utebatur.*

<sup>c</sup> V. 26. 31 B. See also Hippocrates III. 352, 360, 432 (*Joints*, LXIII, LXIX, *Mochlikon*, XXXV).

<sup>d</sup> V. 26. 31 C; VIII. 10. 1 C, G, 7 B, 11. 2; 25. 3.

<sup>e</sup> For Phagedaena and its treatment see V. 26. 34; 28. 3 B; VI. 18. 4; VII. 33.

<sup>f</sup> For Cancrum Oris (*oris cancer*) see VI. 15. 1, where it is described as supervening on ulcers in the mouth; the treatment of these is given in VI. 11. and a dangerous form, said to be often fatal to children, is described under the name of *aphthae*. *Aphthae* are also referred to in Book II. 1. 18 where it is generally assumed that Celsus is speaking of thrush, the popular name of the condition to which the name *Aphtha* is now attached; but under this name he probably included more dangerous varieties of mouth ulceration, which seems to have been a common and fatal form of illness among children; it caused the death of little Canace (*Martial* XI. 91) and perhaps "tore the cheeks of Proca" (*Ovid*, *Fasti* VI. 148).

## APPENDIX I

passages Celsus clearly refers to superficial malignant disease, his name for it is *carcinoma* or *carcinode*. In the principal passage about it <sup>a</sup> he starts by saying that it is not very dangerous unless interfered with by injudicious treatment, but goes on to mention a more dangerous form which he describes as *cacoethes* (κακοήθεις), malignant, using the Greek adjective which is often applied to the disease by Hippocrates.<sup>b</sup> For this variety alone he suggests operative treatment though he gives no details.<sup>c</sup>

He goes on to refer to several varieties of local superficial cancer or rodent ulcer using the terms *carcinode*<sup>d</sup> and *carcinoma*<sup>e</sup> and mentions the disease as occurring on the face, nose, ears, lips, corner of the eye and in the breast; he also speaks of cancerous nasal polypus and carcinoma at the umbilicus.<sup>f</sup>

Celsus says nothing about internal cancer <sup>g</sup>—the κρυπτοὶ καρκίνοι known to Hippocrates and stated by him to be incurable and untreatable.<sup>h</sup>

<sup>a</sup> V. 28. 2 A-F: see also VI. 8. 2 B: when he advises against treatment: *quae (caruncula) fere carcinodes est; itaque attingi non debet*; and VII. 14. 4, *caro quoque carcinomati similis cum periculo tractatur*.

<sup>b</sup> Hippocrates, (*Coac*, 141, 316, 524, 603, Littré, V. 614, 652, 704, 724).

<sup>c</sup> *Tolli nihil nisi cacoethes potest; reliqua (sc. carcinomata) curationibus irritantur* (V. 28 C).

<sup>d</sup> V. 18. 17, 23; VI. 8. 2 B.

<sup>e</sup> V. 28. 2 A, VII. 7. 7.

<sup>f</sup> VII. 14. 1. There is nothing to show whether this was local in origin or had spread outwards from an abdominal organ.

<sup>g</sup> Unless a very uncertain emendation of the text (V. 28. 2 A) is accepted, which makes him refer to cancer of the uterus.

<sup>h</sup> Hippocrates IV. 188 (*Aph.* VI. 38).

## APPENDIX II

### ON THE ANATOMY OF CELSUS

THE eighth book is an epitome, in technical language, of several Hippocratic treatises.<sup>a</sup> The account of Celsus is often confused because he tries to make it brief and his descriptions are not always easy to follow, as the same word is used in different senses.<sup>b</sup> A similar ambiguity still persists in the use of several of these words, and is also found in Greek medical writers.<sup>c</sup>

The subject matter of these chapters is divided as follows :

Sections 1-4. The skull.<sup>d</sup>

Celsus describes correctly the cerebral membrane (*dura mater*), the two tables of bone between which are the frontal air sinuses;<sup>e</sup> the cancellous bone, the diploe; the grooves for arteries and veins. He notes that the sutures of the skull are constant in number and position, except for slight racial and individual variations, and names the following

<sup>a</sup> See Hippocrates, vol. III. (L.C.L.) and Dr. Withington's notes.

<sup>b</sup> e.g. *umerus* = shoulder, upper arm or the bone of the upper arm; *cubitus* = elbow, ulna, forearm; *sura* = calf of the leg, fibula.

<sup>c</sup> For a similar ambiguity in Greek cf. note *a*, p. 599.

<sup>d</sup> *Calvaria*, *κράνιον*, cf. Hippocrates III, 6-12 (*Head Wounds*, I and II).

<sup>e</sup> Cf. pp. 474, 500, 518, note.

## APPENDIX II

sutures; squamosal or temporo-parietal (formed by the temporal bone overlapping the parietal), lambdoid, sagittal, frontal or metopal (which he notes as inconstant); the name of the coronal suture is missing, but this is probably due to a textual corruption.<sup>a</sup> He goes on to mention the *os medium* which was the part of the temporal bone covered by muscles,<sup>b</sup> and the great facial suture consisting of the fronto-zygomatic, fronto-lacrimal, fronto-maxillary and fronto-nasal portions, and finally the naso-maxillary suture consisting of the three divisions—zygomatic-maxillary or malar, median-palatal or inter-maxillary and transverse palato-maxillary.

Sections 5 and 6. Eye, Nose and Ear.

Celsus describes the orbital passages leading through the orbital fissures to the brain and the nasal passages, separated from each other by the vomer and the cartilaginous septum; these connected below with the throat through the naso-pharyngeal respiratory passage, and above with the brain through the ethmoidal channels along which pass the olfactory nerves to supply the sense of smell.<sup>c</sup> In the ear Celsus distinguished the external auditory meatus, the middle ear or tympanic cavity and the internal ear or labyrinth.

Sections 7-10. Zygoma, Jaws, Teeth.

The zygoma (*os iugale*) was so called because it was supported, like an arch or yoke, by the maxillary

<sup>a</sup> Cf. VIII. 1. 2. and critical note.

<sup>b</sup> The term is now applied to the sphenoid and its wings.

<sup>c</sup> Galen (II. 867 ff.) expresses the belief commonly held at the time that the ethmoidal channels also served to introduce air into the brain and to conduct fluid out of it.

## APPENDIX II

or jaw bone. Underneath it was the tempora! fossa, described by Celsus as a "sort of little hollow" near the aural passages. The lower jaw or mandible (*maxilla*)<sup>a</sup> he correctly states to be a single bone after birth,<sup>b</sup> but his description of it as a soft bone is wrong; indeed in the case of some very old skeletons the lower jaw is the only bone which has been preserved. It is tempting to believe with Morgagni<sup>c</sup> that *molle* is a corruption of *mobile*, "movable," as opposed to the upper jaw (*malae*)<sup>a</sup> which is described just below as "immovable" (*immobiles*).

Celsus distinguishes three types of teeth. The incisors (*τομείς*), the eye teeth (canine dentes, *κνιδοόντες*), the teeth for tearing flesh peculiar to the carnivora, and the *maxillares* or "jaw" teeth. Celsus never uses the word *molares* "grinders," nor does he distinguish between the premolars and molars proper, but he mentions that the last four teeth, the so-called wisdom teeth (*scrotini dentes*) are late and irregular in their appearance. He appears to have been the first to state clearly that the milk and permanent teeth grew out of the same root.<sup>d</sup>

<sup>a</sup> The term *maxilla* is applied, in modern anatomy, to one side of the upper jaw: Celsus used *maxilla* for the lower jaw and *malae* (check bones) for the bones of the upper jaw, called by Galen τὰ τῆς ἄνω γένυος.

<sup>b</sup> Hippocrates III. 263 (*Joints*, XXXIV.) believed the bone to be torn across at the symphysis, while Galen (III. 936) regarded the bone as being two. Fallopius points out that in the human child this bone is divisible with a knife up to two years of age (*Observationes Anatomicae* 1561). Vesalius *de Fabrica Humani Corporis* 1543) instanced this statement as a proof of Celsus' knowledge of human anatomy.

<sup>c</sup> Morgagni justifies his conjecture because *mobile* agrees with the statement just below (of the *maxilla*) *sola ea movetur*.

<sup>d</sup> For teething (*dentitio*), cf. also vol. I. p. 94 (II. 1. 18) and vol. III. p. 366 (VII. 12. 1).

## APPENDIX II

### Sections 11-14. The Spine.<sup>a</sup>

Here the description given by Celsus is careful and detailed. Throughout the channels in the transverse processes of the cervical vertebrae the vertebral arteries ascend and the vertebral veins descend. The highest vertebra (the atlas) receives the condyles of the occipital bone in its superior articular pits or fossae, and the second (axis) vertebra articulates by the globular tip of its "tooth" or odontoid process with the dental pit of the atlas. Tendons (*τένοντες* "stretchers") and ligaments combine with muscles at the back of the neck to form the so-called ligament of the nape, while in front there are short and long muscles between the skull and spine. He goes on to describe the intervertebral articular processes controlled by numerous strong ligaments and the discs of fibro-cartilage between the bodies of the vertebrae which act like buffers.

### Sections 14, fin. 15 A. Ribs and Sternum (breast bone).

The ribs articulate with the bodies of the vertebrae by small heads, and with the tips of the transverse processes by tubercles. They are prolonged by bars of cartilage to join the sternum. The sternum begins at the root of the neck and its top part supports the clavicles;<sup>b</sup> at its side are half-moon depressions into which the cartilages of the ribs articulate; its lowest part lies in front of the heart, and it ends in cartilage (the xiphoid process). The five upper ribs articulate with the sternum through

<sup>a</sup> Cf. Hippocrates III. 288 (*Joints*, XLV.).

<sup>b</sup> Celsus does not use the name *manubrium* (handle) now applied to this part of the bone.

## APPENDIX II

their cartilages, the next five (called the *νόθαι*, bastard or false ribs)<sup>a</sup> articulate with one another by means of their cartilages,<sup>b</sup> and the last two (the floating ribs) have the cartilages at their ends embedded in the abdominal wall with which they are associated in movement.

Sections 15, fin. 16. The shoulder blades or blade bones (*scapulae*).<sup>c</sup>

The description given by Celsus is not easy to follow. He starts by mentioning the ridge or spine, the upper margins of which are curved underneath and so form the supra-spinatus fossae. Below its spine the bone is triangular in shape and becomes so thin as to be transparent. At its lower angle, towards the vertebral border, the bone turns into fibro-cartilage.<sup>d</sup> The spine of the scapula (tracing it from the back forwards) is a ridge, low at first, thicker and more pronounced towards the middle, and enlarged at its top end (the acromium process) where it is firmly articulated with the outer end of the clavicle. The spine of the bone is also held in place by the trapezius and other muscles and the costocoracoid ligaments, between the coracoid processes and the ribs; the rest of the bone is unattached and floating.

<sup>a</sup> This name is found in Pausanias 1. 35. 6 *ἐς τὰς ἐλαχίστας πλευράς, καλουμένας δὲ ὑπὸ τῶν ἰατρῶν νόθας*.

<sup>b</sup> Celsus did not comment on the importance of this, which serves, in extraordinary inspiration, to enlarge the lower part of the chest.

<sup>c</sup> Also called from their shape and position *scutula operta* (small hidden shields) or *omoplatae* (Greek *ὠμοπλάται*).

<sup>d</sup> The edge of the blade bone, when dried, is sharp, but in life the fibro-cartilage makes it appear thick and blunt.

## APPENDIX II

Sections 16, fin. and 17. The collar bone, Os Jugulum or Clavicle.<sup>a</sup>

This bone, connecting neck and shoulder is specially liable to fracture owing to its position and curved shape. Celsus notes this and describes how its inner end is inserted into a depression in the side of the manubrium and is held by a ligament down to the first rib, while its outer end articulates with the spine of the scapula, a little below the point of the shoulder, by means of an intra-articular cartilage, which facilitates freedom of movement.<sup>b</sup>

Sections 18-22. Arm and hand.

Here the description of Celsus is clear and correct.

(a) Humerus or upper arm.

He notes that this consisted at each end of cancellous bone, but that its shaft was dense bone, enclosing a marrow cavity. It was slightly convex in front, concave behind. He describes its typical position<sup>c</sup> as that in which the palms of the hands face the thighs, the arm being rotated inwards. The head of the humerus formed a hemisphere, which was firmly held in position against the broad and shallow glenoid fossa by the surrounding muscles and the rim of cartilage which borders the fossa. At the lower end of the bone the trochlea, like a pulley, articulated with the ulna (*cubitus*), and the capitellum, a small globular head, articulated with the radius;

<sup>a</sup> *Claviculum* or key bone, Greek *κλείς* (bolt), Hippocrates III. 234 (*Joints*, XIV.).

<sup>b</sup> See further VII. 8.

<sup>c</sup> At the present day the typical position is with the palms facing forward and the forearm fully supinated.

## APPENDIX II

on either side were the epicondyles, kept in place by muscles and ligaments, and by cartilages which formed linings and rims.

### (b) Radius and ulna or forearm.<sup>a</sup>

Celsus describes how the outer bone of the forearm, the radius, and the ulna, which he always called *cubitus* (the part leant upon), articulated with the humerus, the radius rotating on the ulna at the radial notch, which was embraced by the anular ligament. In the middle of the forearm the radius and ulna were held apart by the interosseous ligament. The broad lower end of the radius articulated directly with the bones of the wrist, the lower end of the ulna articulated at its side with the radius and at its lower end indirectly through an interosseous fragment with the wrist. He notices the styloid process at the end of both radius and ulna.

### Sections 21 and 22. The hand.

In describing the hand Celsus notes that, with very rare exceptions,<sup>b</sup> the number of carpal bones is constant. The navicular or scaphoid bone and the lunate or semilunar bone articulate with the radius. He was the first writer, as far as we know, to state that there were five metacarpal bones connecting the wrist with the fingers, this view is still generally held, but if correct the statement of Celsus that each

<sup>a</sup> Radius = rod, Greek *κερκίς*; the Greek *ώλένη* (ulna), like *cubitus*, means elbow, as well as the bone of the forearm. Cf. Hippocrates III. 189.

<sup>b</sup> These exceptions can now be easily ascertained by means of X-ray photography.

## APPENDIX II

digit had three phalanges is not accurate, as the thumb has only two.<sup>a</sup>

He observed that the nail is formed by the epidermal surface of the skin becoming horny and that it is intimately connected with the deeper layer of the skin which, in its turn, is closely attached to the end of the last phalanx.<sup>b</sup>

### Section 23. The hip bones.

Celsus correctly describes the sacrum, at the end of the vertebral column, with the womb, bladder and rectum protected in its cavity; and its position between the innominate bones, the ilium, which bulges out to form the iliac crest, in front, and the posterior iliac spine at the back; the ischium, which, with the ilium forms the acetabulum or hip joint, and the pubic bone (also called the pecten) which juts forwards from the other two.

### Sections 24, 25 A. The femur or thigh bone.

Celsus correctly notes that the head of the femur is larger than a hemisphere and that the great trochanter points slightly forwards, the lesser trochanter slightly backwards, when the feet are brought together in the typical position. Its shaft is composed of dense bone and encloses a marrow cavity. At its lower end the condyles are separated by the intercondylar fossa and the patella, like a plate, covers the junction between the thigh and the leg. In an

<sup>a</sup> Another view is that the thumb has three phalanges and that it is the first metacarpal which is wanting.

<sup>b</sup> Celsus used the word inner (*interior*) to indicate the end of the phalanx nearer the body (the proximal end) and outer (*exterior*) for that further from the body (the distal end).

## APPENDIX II

adult the patella is entirely composed of bone and is held in place by tendons above, by the ligamentum patellae below and by strong bands of muscle at the sides.

Sections 25-27. The leg bones and feet.

The bones of the leg are called by Celsus *tibia* (shin bone) and *sura* (calf bone). The words are also used, more generally, to describe the shin and calf<sup>a</sup> of the leg respectively. He never uses the name fibula for the calf bone, and it is first used in this sense in much later Latin.<sup>b</sup>

The *talus* (σφυρόν) was the name given by him to the end both of the tibia and fibula; each is now called malleolus (ankle); while the name talus is given to the bone called by Celsus *os transversum talorum*,<sup>c</sup> which articulates with the heel-bone, *os calcis*.<sup>d</sup> Celsus notes that no special description of the foot is necessary, as, anatomically, it corresponds exactly to the hand.

<sup>a</sup> Vol. I. p. 342.

<sup>b</sup> The word *fibula* is only used by Celsus (V. 26. 23 B) when speaking of a pin or clasp for a wound, but the Greek word *περόνη* (originally a brooch, fastening like *fibula*) is used by Hippocrates both of the bone of the calf and of the radius.

<sup>c</sup> Herodotus III. 129, calls the bone *ἀστράγαλος*.

<sup>d</sup> *ὀστέον τῆς πτέρνης*, Hippocrates, III. 122 (*Fractures*, XI).



## LIST OF CHAPTER HEADINGS

### CAPITULA LIBRO V IN COD J PRAESCRIPTA

- I. Asclepiades ex magna parte usum (usu *index*) medicamentorum sustulit (*praef.* 2)
- II. Zenon (*Zeno Jm 1 in indice*) Andrias (*drias J in indice*) Apollonius de facultatibus medicamentorum scripserunt (*praef.* 1)
- III. Quae species sanguinem supprimunt (*deest in marg. capitis*) (I)
- IIII. Quae species glutinat vulnus vel solidat (*glutinant marg. capitis*) (II)
- V. Quae [concoquunt et movent pus] reprimunt (*deest in marg. capitis*) (II *extr.*).
- VI. Quae concoquunt (*concoquunt marg. capitis*) et pus (*pus om marg. capitis*) movent (III).
- VII. Quae aperiunt (IV).
- VIII. Quae purgant (V).
- VIIII. Quae rodunt (*cōmedunt marg. capitis*) (VI).
- X. Quae vehementer exurunt (VII).
- XI. Quae adurunt (VIIII).
- XII. Quae ulceribus crustas (*ulceribus om marg. capitis, cristas in indice m I*) inducunt (IX).
- XIII. Quae resolvunt ulcerum crustas (*crustas resolvit marg. capitis*) (X).
- XIIII. Quae discutiunt ea (*et index*) quae in aliqua parte corporis coierunt (*om marg. capitis*) (XI).

## LIST OF CHAPTER HEADINGS

- XV. Quae evocant vel educunt (XII).  
 XVI. Quae exasperata levent (leviunt *index*) (XIII).  
 XVII. Quae carnem nutriant (XIV).  
 XVIII. Quae molliunt (XV).  
 XVIII. Quae vulnus et cutem purgant (purgat  
*marg. capitis*) (XVI).  
 XX. De mixtionibus medicamentorum (XVII. 1 A).  
 XXI. De ratione ponderum (XVII. 1 C).  
 XXII. Quid inter pastillum et emplastrum intersit  
 (interest *index*) (XVII. 2 A).  
 XXIII. De pastillo (XVII. 2 C).  
 XXIII. De malagmatis (XVIII).  
 XXV. *Ad* (De *in marg. capitis, om index*) calidam  
 podagram (calida podagra *marg.*) refrigerans  
 (refrigerant *index, refrigerandum marg.*) (XVIII. 1).  
 XXVI. De hydropo (hydropico *marg. capitis*)  
 (XVIII. 2).  
 XXVII. De iecore (XVIII. 3).  
 XXVIII. De liene (cura splenis *marg. capitis*)  
 (XVIII. 4).  
 XXVIII. <Quae> Lysias composuit (Quae *addidi* :  
*lemma om capitis marg.*) (XVIII. 5).  
 XXX. De lateribus. <Quae> Apollophanes com-  
 posuit (Quae *addidi*) (XVIII. 6).  
 XXXI. Ad lateris dolorem[s] Andriae compositio  
 (composuit *index*) (XVIII. 7).  
 XXXII. Polyarchion (*ita marg. capitis* : Pobarcion  
*index*) [confectio]. (XVIII. 8: *conf Galen. XIII,*  
 p. 184, 981 K).  
 XXXIII. Mosci confectio (XVIII. 10).  
 XXXIII. Medi confectio (XVIII. 11).  
 XXXV. Pantaeni (*ita index, pantheni marg. capitis*)  
 confectio (XVIII. 12).  
 XXXVI. De struma (XVIII. 13).

## LIST OF CHAPTER HEADINGS

- XXXVII. Andreas (Andrias *index*) de struma (XVIII. 14).
- XXXVIII. Expeditius ad strumas (struma *index*) (XVIII. 15).
- XXXVIII. Arabis (Arabs *index*) cuiusdam ad incipientes strumas (*lemma om in marg. capitis*) (XVIII. 16).
- XL. Ad strumas <et> tubera quae difficile concoquantur (conquoquantur *index*) et ad carcinum (XVIII. 17).
- XLI. Protarchi (Protharci *index*) [contra fanum] (XVIII. 18).
- XLII. Adversus panum (XVIII. 19).
- XLIII. Ad contusam faciem (XVIII. 24).
- XLIII. Anastomotica (Anostomatica *index, totum lemma om marg. capitis*) quae aperiendi vim habent (*habet index*) etiam in strumis (XVIII. 25).
- XLV. Niconis (Nigonis *index*) (XVIII. 26).
- XLVI. Ad ossa Aristogenis (et nervis convenit *add marg. capitis*) (XVIII. 27).
- XLVII. De malagma maxime articulis et nervis conveniente (*in his convenit index: de malagma maxime articulis et ad omnem dolorem in marg. capitis*) (XVIII. 28).  
 Ad articulos et ad omnem dolorem (*ita index: om in marg. capitis*) (XVIII. 28).
- XLVIII. Ad digitos (ad eosdem digitos *marg. capitis*) (XVIII. 28).
- XLVIII. Ad dolores articulorum (*deest in marg. capitis*) (XVIII. 29).
- L. Chryssippi (Crysi *index*) (XVIII. 30).
- LI. Clesipoontis (*ita index: clesypontis marg. capitis*) (XVIII. 31).
- LII. Podagrae eadem (XVIII. 33).

## LIST OF CHAPTER HEADINGS

- LIII. Aristonis (XVIII. 33).  
 LIIII. Theoxeni (Theosini *index*) (XVIII. 34).  
 LV. Numenii (Numadi *index*) (XVIII. 35).  
 LVI. Dexius (Dexios *index*) ad callos qui in pedibus nascuntur (XVIII. 36).  
 LVII. Inter emplastra efficacissima ea quae cruentis statim imponuntur (imponitur *fuit utroque loco*) (XIX).  
 LVIII. Emplastrum barbarum colore nigro (*om in marg. capitis*) (XIX. 1).  
 LVIIII. Emplastrum Coacon colore nigro (XIX. 2).  
 LX. Quos colores emplastris quae species faciant (XIX. 2).  
 LXI. Basilicon colore nigro (XIX. 3).  
 LXII. Smaragdinum [rerum] perviride (XIX. 4).  
 LXIII. Coloris rufi (ruffi *index*) quod vulnera ad cicatricem celeriter perducatur (adducit *index*) (XIX. 5).  
 LXIIII. Colleticon (colliticen *cod utroque loco*) a glutinando (ad glutinandum *cod utroque loco*) dictum (XIX. 6).  
 LXV. Quae capitibus fractis conveniunt, cephalica nominantur (XIX. 7).  
 LXVI. Compositio Philotae ad capitis vulnus (*om in marg. capitis*) (XIX. 7).  
 LXVII. Aliud ad idem viride[m] (*om marg. capitis*) (XIX. 8).  
 LXVIII. De movendo pure (XIX. 9).  
 LXVIIII. [De] tetrapharmacon nigri coloris (*om marg. capitis*) (XIX. 9).  
 LXX. Enneapharmacon (Aenea pharmacon *index*, aenea pharmacon *marg. capitis*) (XIX. 10).  
 LXXI. Iudaei (Lubei *index*) (XIX. 11 B).  
 LXXII. Emplastra epispastica (exipipastica *marg.*

## LIST OF CHAPTER HEADINGS

- capitis*, ex isis (ipsis *m* 2) spastica *index*) (XIX. 12).
- LXXIII. Diadaphnidon quia (qui *cod utroque loco*)  
*bacas lauri accipit dictum (dictum om marg. capitis)*  
 (XIX. 12).
- LXXIII. Aliud ad pus movendum (XIX. 13).
- LXXV. Rypodes ad extrahendum optimum (XIX. 15).
- LXXVI. Hecataeo (haec adeo *cod utroque loco*)  
 (XIX. 16).
- LXXVII. Emplastrum ad idem viride[m] Alexan-  
 drinum (XIX. 17).
- LXXVIII. De emplastris exedentibus (XIX. 18).
- LXXVIII. Aliud quod (qui *cod utroque loco*) exedit,  
 vehementer ossa resolvit, supercrescentem carnem  
 coercet (coercit *index*) (XIX. 19).
- LXXX. Hoc etiam plagis recentibus (*om marg.*  
*capitis*) (XIX. 22).
- LXXXI. Aliud candidi coloris (aliud vocandi di-  
 coloris *marg. capitis*, Ali advocandi dicoloris *inde*)  
 (XIX. 23).
- LXXXII. Quotiens cerussa empl (*i.e.* emplastris?)  
 mittitur, in quibus aqua vel oleum adicitur,  
*ccrussam (cerussa cod)* ex his coquendam (*om*  
*marg. capitis totum lemma*) (XIX. 24).
- LXXXIII. De lentis emplastris (XIX. 25).
- LXXXIII. Alia compositio lenti emplastri (XIX.  
 26).
- LXXXV. Tertia Archagathi (archagathi *cod utroque*  
*loco*) (XIX. 27).
- LXXXVI. De pastillis (XX).
- LXXXVII. Alius (XX. 1 B).
- LXXXVIII. Aliud (XX. 2).
- LXXXVIII. Ad ulcera sordida (XX. 3).

## LIST OF CHAPTER HEADINGS

- XC. Andronis (XX. 4).
- XCI. Polydis paragis convenit nervis cartilagini musculis (XX. 2, 1 A: *legerat Polydi sphragis: lemma falso loco positum*).
- XCII. Ad calculum eiciendum (XX. 6).
- XCIII. De pessariis quae feminis subiciuntur (XXI).
- XCIIII. De evocando (vocando *marg. capitis*) sanguine feminarum (XXI. 1).
- XCV. Vulvae molliendae (XXI. 2).
- XCVI. Boetho (Bocto *index*) auctore (XXI. 3).
- XCVII. Ad inflammationem (inflationem *index*) vulvae (*om margo capitis totum lemma*) (XXI. 4).
- XCVIII. Si infans in vulva decessit (XXI. 5).
- XCVIIII. Hierae compositio (XXII. 3).
- C. Iudaei (*iudae marg. capitis, Lydae index*) (XXII. 4).
- CI. Iollas (*Tollas index, om marg. capitis*) (XXII. 5).
- CII. De membrana quae supra cerebrum est (XXII. 6).
- CIII. Timaci ad ignem sacrum ad cancerum (XXII. 7).
- CIIII. De gargarizatione (*gargarizzazione marg. capitis*) (XXII. 9).
- CV. De antidotis (XXIII).
- CVI. Adversus venena et morsus venenatos (XXIII. 1 B).
- CVII. Aliud ambrosia (*Alutā brosia index*) dicitur (XXIII. 2).
- CVIII. Antidotum Mithridatis (XXIII. 3).
- CVIIII. De acopis (XXIV. 1).
- CX. Aliud evodes dicitur (XXIV. 2).
- CXI. Acopa † liquide nigra dicuntur Graecis (*graece marg. capitis; fuit: liquidaencrista*) (XXIV. 3).
- CXII. Ad sacrum ignem (remedium *add in marg. capitis*) (XXIV. 4).

## LIST OF CHAPTER HEADINGS

- CXIII. De catapotiiis (confectio catapotiorum *marg. capitis*) (XXV. 1).
- CXIII. De iocinere (ad iecur sanandum *marg. capitis*) (XXV. 6).
- CXV. Ad lateris dolores (dolorem *marg. capitis*) (XXV. 7).
- CXVI. Ad thoracis (XXV. 8).
- CXVII. Ad tussim (tussem *index*) Athenionis (athenionid *marg. capitis*) (XXV. 9).
- CXVIII. Si purganda sunt vulnera in faucibus tussientium (XXV. 11).
- CXVIII. Colic[a]e Cassi (XXV. 12).
- CXX. Partu laboranti (*ita index*: intra mulierem si pecus mortuum fuerit aut si secundae tardant (*marg. capitis*) (XXV. 14. 13).
- CXXI. Vocem adiuvat (XXV. 15).
- CXXII. Adversus urinae difficultatem (*om marg. capitis*) (XXV. 16).
- CXXIII. Arteriac[a]e (XXV. 17) vel signa diversorum (diversa *index*) vulnerum (*om index*) (XXVI. 1).
- CXXIII. Quae in corpore vulnera (vulnerata *marg.*) sanari nequeunt (XXVI. 2).
- CXXV. Basis cerebri (XXVI. 2).
- CXXVI. Tutissimum vulnus in carne (XXVI. 3 extr.).
- CXXVII. Vulneris qualitatem figura (figurā *index*) ipsius esse noscendam (XXVI. 5).
- CXXVIII. De corde vulnerato (vulnera *index*) (XXVI. 8).
- CXXVIII. Quibus signis pulmo vulneratus possit (*possi marg. capitis*) agnosci (XXVI. 9).
- CXXX. Iocineris vulnerati inditia (XXVI. 10).
- CXXXI. Inditia renium (renum *marg. capitis*) vulneratorum (XXVI. 11).

## LIST OF CHAPTER HEADINGS

- CXXXII. Liene vulnerato (XXVI. 12).
- CXXXIII. Cum vulva percussa est (XXVI. 13: *om marg. capitis*).
- CXXXIIII. Si stomachus percussus est (XXVI. 15).
- CXXXV. Intestini ieiuni et ventris vulnerati communes notae sunt (XXVI. 16).
- CXXXVI. Medulla in spina si (si in spina *marg. capitis*) icta est (XXVI. 17).
- CXXXVII. Si septum transversum (XXVI. 18).
- CXXXVIII. Si vesica vulnerata est (XXVI. 19).
- CXXXVIII. De sanguine sanie pure e[t] vulneribus emanante (*ita index*: Signa humorum ex vulnere fluentium *marg. capitis*) (XXVI. 20).
- CXL. Sanies hydrus (hydrops *marg.*) vel melitera (melicrato *marg. capitis*) (XXVI. 20 B).
- CXLI. Pus eleodis (*om marg. capitis*) (XXVI. 20 B).
- CXLII. Nunc de hydro (hydrops *marg. capitis*) sanie (saniem *marg. capitis*) (XXVI. 20 B).
- CXLIII. Melitera qualis sit (XXVI. 20 B).
- CXLIII. Eleodes pus quale (qualis *index*) sit (XXVI. 20 C).
- CXLV. Nunc de sanguine qui bonus qui malus sit (XXVI. 20 C).
- CXLVI. Quae sanies bona vel mala est (bona vel mala est *marg. capitis*) (XXVI. 20 D).
- CXLVII. Hydros (hydrops *marg. capitis*) mala (XXVI. 20 E).
- CXLVIII. Tol[er]abilior (XXVI. 20 E).
- CXLVIII. Melitera mala (XXVI. 20 E).
- CL. Melior (XXVI. 20 E).
- CLI. Pus inter omnia optimum (*om marg. capitis*) (XXVI. 20 E).

## LIST OF CHAPTER HEADINGS.

- CLII. Ad perstringendum fluxum sanguinis (*ita marg. capitis* : Perstringendo fluxum sanguinis *index* (XXVI. 21 A) *corrigere* restringendum).
- CLIII. Si restrictio (restricto *index*) sanguine <*m*> non retinet, venarum capita *liganda* (iungenda *index* iungenda sunt *marg. capitis*) (XXVI. 21 C).
- CLIIII. Venarum capita si necesse fuerit adurenda (XXVI. 21 C).
- CLV. Cucurbita adposita sanguinis impetum <*alio*> conferri (*alio addidi* : XXVI. 21 C).
- CLVI. Vulnerato musculo abscisionem ex integro necessariam ut sanetur (XXVI. 22).
- CLVII. De glutinatione vulnerum (*om marg.*) (XXVI. 23 A).
- CLVIII. Suenda vulnera (*om marg.*) (XXVI. 23 A).
- CLVIII. De fibulis (*om. marg. capitis*) (XXVI. 23 B).
- CLX. Recentibus vulneribus spongas cum aceto adponendas (*om marg. capitis*) (XXVI. 23 E).
- CLXI. Spongia cum aqua ac vino (*om marg. capitis*) (XXVI. 23 E).
- CLXII. Spongia ex aqua frigida (*om marg. capitis*) (XXVI. 23 E).
- CLXIII. Sine sebo vulneribus expedire (*om marg. capitis*) (XXVI. 23 F).
- CLXIII. Fascia linea vulnera *liganda* (XXVI. 24).
- CLXV. Qui (Quod *index*) nimis exanguinant (*ita marg. capitis*, exanguinat *index*), vino reficiendi ante (*antea marg. capitis*) *curationem* (aequationem *cod. utroque loco*) (XXVI. 25 B).
- CLXVI. Vulneratis belneum non expedire (XXVI. 28 D).
- CLXVII. Surculum de vulnere tollit si radix arundinis contusa adponatur (apponatur *marg. capitis*) (XXVI. 35 C).

## LIST OF CHAPTER HEADINGS

- CLXVIII. Esse arundinem medicinale (XXVI. 35 C).
- CLXVIII. Nunc de morsibus (remedia diversis morsibus necessaria *marg. capitis*) (XXVII).
- CLXX. Si quando gravis morsus est, cucurbita apponenda (XVII. 1 A).
- CLXXI. Diogeni (diogene *marg. capitis* Diogereq: *index*) (XXVII. 1 A).
- CLXXII. Ad canis rabidi morsum cucurbitam admovendam (admoū *marg. capitis*) (XXVII. 2 A).
- CLXXIII. Defectam balneis personam inebriandam vehementer (XXVII. 2 B).
- CLXXIII. Adversus † omniumq: pene morsus supra legandus (*scribendum*: Adversus omnium anguium venena. Morsus supra ligandus) (XXVII. 3 A).
- CLXXV. Cucurbita extrahenda (extrahi venena *marg. capitis*) (XXVII. 3 A: *excidit* venena).
- CLXXVI. Si cucurbita non fuerit exsugenda (exsucanda *index* exucandam *marg. capitis*) (XXVII. 3 B).
- CLXXVII. De aspidis morsu usus vel casus remedium invenit (XXVII. 4).
- CLXXVIII. De scorpionis morsu (XXVII. 5).
- CLXXVIII. Adversus aranei morsum (XXVII. 6).
- CLXXX. Si cerastes (cerastis *marg. capitis*) vel dipsas vel emorois (emordis *cod utroque loco*) momorderit (XXVII. 7).
- CLXXXI. Ad morsum celidri (*ita index m 2*, ceridri *m 1*, chersydri *marg. capitis*) (XXVII. 8).
- CLXXXII. Ad phalangionis (*ita index* phalangionis *marg. capitis*) morsus quaerenda (morsum succurrenda *index*) remedia (XXVII. 9).

## LIST OF CHAPTER HEADINGS

- CLXXXIII. Cantharidas (Cantaredas *index*) (XXVII. 12) [sive (*ita index* : sine *marg. capitis*)] ustis (XXVII. 13). *Duo lemmata perperam coniuncta.*
- CLXXXIII. Signa et cura (doloris *add marg. capitis*) theriomae (XXVIII. 3).
- CLXXXV. Signa et cura ignis sacri (in igni sacro *marg. capitis*) (XXVIII. 4).
- CLXXXVI. Aliud genus ignis sacri (XXVIII. 4 B).
- CLXXXVII. Syringii ratio in quocunque loco corporis inquirenda (inquirendae *marg. capitis*) (XXVIII. 12).
- CLXXXVIII. De communibus fistulis (XXVIII. 12 A).
- CLXXXVIII. De collyriis *index* colliriis *marg. capitis*) fistularum qualiter fieri debeant (XXVIII. 12 G).
- CXC. Signa clavi et curae (XXVIII. 14 C).
- CXCI. Signa pustularum et curae (XXVIII. 15).
- CXCII. De herpen *pusula* (de herpentu *sula* herpen *marg. capitis ad* XXVIII. 15 BC, De Herpentu *sola index* : *conf* XXVIII. 4 A).
- CXCIII. Herpen : *vide lemma antecedens. In marg. capitis cum priore lemmate coniunctum.*
- CXCIII. De scabie (XXVIII. 16).
- CXCV. Protharci (Protharsi *index*) ad scabiem (XXVIII. 16 C).  
Impetigo (*om index* : XXVIII. 17).
- CXCVI. Tertium impetiginis genus : nigra dicitur (XXVIII. 17 B).
- CXCVII. Quartum genus impetiginis quod curam non recipit (non recipit curam *marg. capitis*) (XXVIII. 17 C).
- CXCVIII. Agria id est fera (XXVIII. 18 A).

## LIST OF CHAPTER HEADINGS

CXCVIII. De vitiligene (De vituli gene *index*) (XXVIII. 19).

CC. Alphos (alphi *marg. capitis*, Alfo *index*) [aurigo] (auligo *cod utroque loco*) (XXVIII. 19 A).

CCI. Melas (*om marg. capitis*) (XXVIII. 19 B).

CCII. Leuce (XXVIII. 19 B).

Expliciuut capitula quinti libri feliciter.

De medicamentis et simplicibus (I.—XVI.) et compositis (XVII.—XXV.) [hisq:]: quemadmodum curentur vulnera. In quo de qualitatibus pigmentorum et de signis (XXVI.) interiora vulnera (XXVI. 35—36). morsus (XXVII.) venena (XXVII. 12). usta (XXVII. 13). carbunculus (XXVIII. 1): carcinomata (XXVIII. 2). Keridima (XXVIII. 3). sacer ignis (XXVIII. 4). ulcus chironium (XXVIII. 5). et hibernum (XXVIII. 6). struma (XXVIII. 7). furunculus (XXVIII. 8). chyma (XXVIII. 9). sanies. abscessus (XXVIII. 11). fistula (XXVIII. 12). favus (XXVIII. 13). agrochordon thymium. myrmetium. clavi (XXVIII. 14). pusulae (XXVIII. 15). scabies (XXVIII. 16). impetigo (XXVIII. 17). papulae (XXVIII. 18). vitiligo (XXVIII. 19).

Artium Aurelii Cornelii Celsi liber X. idem medicinae liber quintus incipit feliciter.

## CAPITULA LIBRO VI PRAESCRIPTA IN J

I. De vitiis diversis praefatio (*om marg. capitis*) (I.—V).

II. Oculorum curatio incipit (VI).

III. De lippitudine (VI. I A).

III. Sanguinem detrahendum (VI. 1 E).

## LIST OF CHAPTER HEADINGS

- V. Recte alvum subduci (VI. 1 E).
- VI. In (an *marg. capitis*) impetu gravi sanguinem tollendum, in levi ventrem ducendum (decucendum *index*) (VI. 1 F).
- VII. Non nimis abstinendum (VI. 1 G).
- VIII. Ad stringendum venas (VI. 1 H).
- VIII. De collyriis incipit (VI. 2).
- X. Dionysi (*dionysius marg. capitis*) (VI. 4).
- XI. Aliud (VI. 5).
- XII. Euelpides (VI. 8).
- XIII. Si quod medicamentum a medico (*medici index*) infundendum, lacrimam (*lacrimum cod utroque loco*) oui aut lac muliebre (*lacte muliebris marg. capitis*) est (VI. 8 B).
- XIII. Cleonis collyrium (*conlyrium index*) (VI. 8 G).
- XV. Oculorum † quid fieret (*quod eduruit scribendum*) excidendum (*excedendum cod utroque loco*) ut dolor cesset (VI. 9 C).
- XVI. De carbunculis oculorum (VI. 10).
- XVII. [E]nilei (*Eniles index*) conlyrium (VI. 11).
- XVIII. Filalithus (*Silalicus index, philalytus marg. capitis*) (VI. 12).
- XVIII. † Dialibanus (VI. 13).
- XX. De pediculis (VI. 15).
- XXI. Dia tu ceratos (*ceratus utroque loco cod*) (VI. 16 C).
- XXII. Euelpides (VI. 17).
- XXIII. Memigmenon (VI. 18).
- XXIII. Zmilion (*zmelion utroque loco cod*) (VI. 18).
- XXV. † Chiron Euelpidis (*euelpides marg. capitis, euelpis index*) (VI. 20).
- XXVI. spherion (*Sperion index*) (VI. 21).
- XXVII. Philaletus (VI. 23).

## LIST OF CHAPTER HEADINGS

- XXVIII. † Spelion (sphe ion *s. s. l marg. capitis*)  
vetustis vulneribus (VI. 23).
- XXVIII. Nomen auctoris Hermon qui conscripsit  
ad (ab *index*) ulcera (ulceribus *cod utroque loco*)  
profutura (VI. 24).
- XXX. Sperion (*om marg. capitis*) (VI. 25). Asclepii  
confectio (*om index*) (VI. 25).
- XXXI. Nomen confectionis zmlon uel Canopitae  
(VI. 25).
- XXXII. Caesianum medicamentum (VI. 27 B).
- XXXIII. P[h]ixinum (per hixianum *marg. capitis*)  
(VI. 28).
- XXXIII. Supra aridam lippitudinem panem ex  
(et *marg. capitis*) vino confectum *imponi* (ripon  
*index* rhiphon *marg. capitis*) dixit (VI. 31 C).
- XXXV. Asclepius ad caliginem } *inverso*  
(VI. 32). } *ordine*
- XXXVI. Dia crocou (VI. 33). } *margo.*
- XXXVII. Ad caliginem nocturnam (VI. 38).
- XXXVIII. Hinc (huic *marg. capitis*) aurium cura  
quaerenda (quaerendi *index*) (VII).
- XXXVIII. Omnia medicamenta auribus strigele  
instillanda (stringile distillanda *index*) (VII. 1 C).
- XL. Si aures pus habent (VII. 2).
- XLI. Quae ulcera oris curant (*curant bis scriptum*  
*in indice*), etiam auribus prosunt (*prosint index m I*)  
(VII. 2 A).
- XLII. Erasistrati (Herasistratus *index*) (VII. 2 B).
- XLIII. Ptolemaei chirurgi (chirurgici *marg. capitis*)  
(VII. 2 B).
- XLIII. Menophili validum (*om marg. capitis*) (VII.  
2 C).
- XLV. Si vero (vero *om index*) vermes in aure[s]  
sint (*sint in aurem index*) (VII. 5).

## LIST OF CHAPTER HEADINGS

- XLVI. Si quando aures clausae sordibus dolorem intus tenent (vetus tenet *marg. capitis*), mel optimum incoctum (coctum *marg. capitis*) in aurem mittendum (VII. 6).
- XLVII. Si aliquis gravius audire coeperit (VII. 7).
- XLVIII. Si sonus cum inflammatione est (VII. 8 D).
- XLVIII. Si in aurem aliquid inciderit (ceciderit *marg. capitis*) (VII. 9).
- L. Si pulex insiluerit (ei fuerit *index*) in aurem (VII. 9).  
In dentium cura quaerendum (*om index*) (IX).  
Si dens exesus est (*om index*) (IX. 5).
- LI. Experimento (experimentum *cod utroque loco*) agrestium cognitum remedium ad dolorem dentium (IX. 7).
- LII. Faucium cura hinc quaerenda (quaerendum *marg. capitis*) (X).
- LIII. De oris ulceribus (XI).
- LIIII. Hinc gingivarum cura (curas *index*) quaerenda (XIII).
- LV. Hinc quaerenda uvae remedia (uvae quaerendae remedium *marg. capitis*) (XIV).
- LVI. Si cancer in os natus fuerit (XV).
- LVII. Si sub auribus parotides (parotides *index*) ortae sint (XVI).
- LVIII. De umbilico prominente (XVII).
- LVIII. De obscenis (XVIII).
- LX. De cole id est (De coleide *marg. capitis*, De colera est *index*) viri membro (membrum *utroque loco cod*) (XVIII. 2).
- LXI. *Eadem* (Ad ea *cod utroque loco*) compositio (comp *marg. capitis*) tonsillis et uvae et naribus (tonxillae uvae naribus *index*) (XVIII. 2 D).
- LXII. De testiculis (XVIII. 6).

## LIST OF CHAPTER HEADINGS

- LXIII. Si vetustior iam durities est (XVIII. 6 A).  
 LXIII. Si ex ictu tument (XVIII. 6 B).  
 LXV. Si ex ictu testiculus ali[i] desit (*om marg. capitis*) (XVIII. 6 B).  
 LXVI. De anu (XVIII. 7).  
 LXVII. De regadiis (XVIII. 7 A).  
 LXVIII. Si quod laesum (*laesus marg. capitis*) est foris est (XVIII. 7 B).  
 LXVIII. Si condiloma (Si condylima sit *index*) (XVIII. 8).  
 LXX. Qualiter anus debet (*debeat marg. capitis*) alligari (XVIII. 8 B).  
 LXXI. Si vetus condiloma (XVIII. 8 C).  
 LXXII. De hemorroidis (*emorruidis index*) (XVIII. 9).  
 LXXIII. Si anus vel os vulvae decidit (*om marg. capitis*) (XVIII. 10).  
 LXXIII. Fungo simile in ano nasci solet (XVIII. 11).  
 LXXV. De ulceribus digitorum (XIX.).  
 Per quae medicamenta succuratur capillis fluentibus (I) porriginibus casi (*scribendum* porrigini sycosi (II, III) areis (IV) varis (V) lenticulis (V) Ephelidi (V) oculis (VI) cuiribus (VII) haribus (VIII) dentibus (IX) tonsillis (X) oris ulceribus (XI) uvae (XIV) umbilico prominenti (XVII) naturalibus partibus (XVIII) digitorum ulceribus (XIX) unguibus scabris (XIX. 3).

### CAPITULA LIBRO VII PRAESCRIPTA IN J

- I. Qualis (Quales *index*) esse chirurgus (*chirurgicus esse marg. capitis*) debet (*praef.* 4).  
 II. De luxatis (I) *om marg.*

## LIST OF CHAPTER HEADINGS

- III. De vulneribus † quae se (se *om index*) ostensa suppurant (II) (*fuit* in quibus se ostendat suppuratio).
- III. Signa curarum bona vel mala (*om marg. capitis*) (III).
- V. Fistularum ratio (IV).
- VI. De fistulis ani (*om marg. capitis*) (IV. 4).
- VII. De telis quae corpori fixa non exeunt (V).
- VIII. De qualitate vulnerum (VI).  
 Ad orziolum (*om index*) (VII. 2).  
 De ungue (*om index*) (VII. 4).
- VIII. Quae vitia nascuntur ex ungue oculorum (oculorum *om marg. capitis*) (VII. 5).
- X. De syringiis (*ita index m 2*, syringis *m 1* syringiis *marg. capitis*) quae nascuntur in angulis oculorum (VII. 7).
- XI. Cura pilorum adulterorum (VII. 8).
- XII. Cura acini (VII. 11).
- XIII. De clavis (VII. 12).
- XIII. De cataractis (VII. 13: conf Bonnet de Gregorii Turon. sermone p. 219, 4).
- XV. Qualiter fluens humor oculorum potest agnosci (curabilis vel incurabilis *add marg. capitis*) (VII. 15).
- XVI. Curae aurium (VIII).
- XVII. Cura polyp[*p*]i (X).
- XVIII. De ozena quid senserint (senserit *cod utroque loco*) (XI).
- XVIII. Diversae oris curae (oris curae diversae *marg. capitis*) (XII).
- XX. Curae uvae (XII. 3).
- XXI. De lingua muta (XII. 4).
- XXII. Si quid sub lingua nascitur quali curatione solvatur (XII. 5).
- XXIII. Cura labiorum (XII. 6).

## LIST OF CHAPTER HEADINGS

- XXIII. De his quae in cervice nascuntur (XIII).  
 XXV. Cura eminentis intestini (XIV).  
 XXVI. Qualiter aqua sit tollenda hydropicis (XV).  
 XXVII. Casus intestini vulnerati vel curae (XVI).  
 De exposito tumore qui diversis casibus evenit super pectinem (XVII). *Ita marg. capitum: in indice hoc modo erratum: Casus intestini vulnerati qui diversis casibus evenit super pectine os, duobus titulis in unum conflatis.*
- XXVIII. De varicibus (XVII. 2).  
 XXVIII. De testiculis (XVIII).  
 XXX. De curis testiculorum (XIX).  
 XXXI. Si cui intestinum descendit (*om marg. capitum*) (XX).  
 XXXII. De omento (XXI).  
 XXXIII. De ramis aegritudinis ipsius (*addendum curatio*) (XXII).  
 XXXIII. De carne quae inter tunicas crescit (XXIII).  
 XXXV. De ramo qui in inguine nascitur (XXIV).  
 XXXVI. Si glans nuda est (XXV. 1).  
 XXXVII. Si glans nudari non potest (XXV. 2).  
 XXXVIII. De fibulis adulescentium (*adulescentum marg. capitum*) (XXV. 3).  
 XXXVIII. De calculis execandis et extrahendis (XXVI. 1 C).  
 XL. Cui aetati calculos (*index*) competenter extrahitur (*extrahit marg. capitum*) (XXVI. 2).  
 XLI. Quod victus (*genus*) necessarium (*necessarius cod utroque loco*) est calculum sublaturis (XXVI. 2 B) (*genus addidi*).  
 XLII. Signa calculorum (XXVI. 3).  
 XLIII. Cura de calculis feminarum (XXVI. 4).  
 XLIII. De (*om marg. capitum*) cancro qui nasci solet dum calculus (*calculos marg. capitum*) negle-

## LIST OF CHAPTER HEADINGS

- genter extrahitur (negligenter abstrahitur  *marg. capitis*) (XXVII).
- XLV. De feminis quibus aut (aut  *om index*) naturaliter virorum coitus prohibetur aut culpa curantis (curantis est  *index*) (XXVIII).
- XLVI. Qua ratione mortuum pecus extrahatur (pecus excutiatum mortuum  *marg. capitis*) (XXIX).  
De cura ani ( *om index*) (XXX. 1).
- XLVII. De tuberculis (XXX. 2).
- XLVIII. Si sanguis per venas fluit (fluit  *marg. capitis*, fluxit  *index*) (XXX. 3).
- XLVIII. Ratio cruris (XXXI).
- L. Cura digitorum (XXXII).
- LI. De cancro vel quibus locis nascatur (nascitur  *marg. capitis*) (XXXIII).
- Quemadmodum manu curentur abscessus (II) fistulae (IV) tela eximantur (V) excidantur tubercula in capite (VI) et quicquid manu curandum est in oculis (VII) naribus (VIII) auribus (VIII) ore (XII) cervice (XIII) ventre (XIV) naturalibus (XXV) cruribus (XXXI) brachiis ( *hoc temere additum videtur*) digitis (XXXII).

## CAPITULA LIBRO VIII PRAESCRIPTA IN J

- |                                      |   |                           |
|--------------------------------------|---|---------------------------|
| I. De expositione capitis (I).       | } | <i> om marg. capitum.</i> |
| II. Expositio naturae aurium (I. 6). |   |                           |
| III. De dentibus (I. 9).             |   |                           |
| III. Expositio spinae (I. 11).       |   |                           |
| V. Expositio costarum (I. 14).       |   |                           |
| VI. Expositio iuguli (I. 17).        |   |                           |
| VII. Humeri (I. 18).                 |   |                           |

## LIST OF CHAPTER HEADINGS

- VIII. Cubitus (I. 20).  
 VIII. Manus (De manibus *marg. capitis*) (I. 21).  
 X. De ima (imma *marg. capitis*) spina (I. 23).  
 XI. De eari[a]e. cura (*curae marg. capitis*) et signa (II. 3).  
 XII. Expositio ferramentorum (III).  
 XIII. Signa capitis vulnerati (IV).  
 XIII. Medicamenta (medicamentum *marg. capitis*) capitis (IV. 19).  
 XV. Curae narium (V).  
 XVI. De auribus (VI).  
 XVII. De ossibus vulneratis (VII).  
 XVIII. De costis (IX).  
 XVIII. De fractis ossibus involuendis } *om marg.*  
 (X. 1 E). } *capitum.*  
 XX. De humero (X. 2).  
 XXI. De luxatis (XI).  
 XXII. De (*om marg. capitis*) cura maxillae (XII).  
 XXIII. De capite (XIII).  
 XXIII. De spina (XIV).  
 XXV. De humero (XV).  
 XXVI. De cubitu (De cubitus *index*) (XVI).  
 XXVII. De manu (XVII).  
 XXVIII. De palma (XVIII).  
 XXVIII. De digitis (XIX).  
 XXX. De cruribus (XX).  
 XXXI. De talo (XXII).  
 XXXII. De ossibus plantae *om marg. capitis* (XXIII).  
 De ossibus eapitis (II) de Maxillarum in quo de  
 varietate fracturarum (tracturarum Cod) (VII)  
 de Jugulo (VIII) in quo de qualitatibus ossuum  
 (VIII. 2) et si eum vulnere vel sine eo fracta (tracte

## LIST OF CHAPTER HEADINGS

Cod.) (VIII. 2) de Costa (coica Cod.) (IX) humero  
(X. 1) femora (temire Cod.) (X) Crure (X. 5) digitis  
(X. 6) in quibus ossa ut manere aut entrahi (X. 1 B)  
et de ligaturis (X. 1 E) *quae scripta sunt tamquam  
initium libri ante.* Superest ea pars. e.q.s.

## PARALLEL PASSAGES IN HIPPOCRATES AND CELSUS

IN the following list references are given to passages in the first seven books of Celsus which correspond with passages in the following works of Hippocrates; *Aphorisms*, *Prognostics*, *Regimen*, *Airs, Breath, Humours*, and *Art* (where the numeration given is that of Hippocrates, vols. I, II, and IV, translated by Dr. W. H. S. Jones, and published in the Loeb Classical Library), and *Prorrhetics*, *Epidemics*, *Diseases*, *Coan Prognostics*, *Affections*, *The Heart*, *The Nature of Man* (where the numeration given is that of Littré's edition). References to Book VIII of Celsus and to the surgical works of Hippocrates (*Head Wounds*, *Surgery*, *Fractures*, *Joints*, *Mochlikon*, which are in vol. III of the edition published in the L.C.L., translated by Dr. Withington) are not given here, as Book VIII is practically an epitome of these Hippocratic treatises, and so the references to them are given in notes at the beginning of the Chapters of Book VIII.

Hippocrates.	Celsus.	Hippocrates.	Celsus.
<i>Aphorisms.</i>		<i>Aphorisms.</i>	
I. 3	I. 1. 3-II. 2. 1	15, 18	I. 3. 34
6	II. 11. 6	16	III. 6. 10
7	III. 6. 12	II. 1	II. 6. 8
9, 11	III. 4. 16; 5. 8	1, 3	II. 4. 2
13	Pr. 72-I. 3. 32	4	I. 3. 2
14	Pr. 20-I. 3. 32	6	II. 7. 21

# PASSAGES IN HIPPOCRATES AND CELSUS

Hippocrates.	Celsus.	Hippocrates.	Celsus.
<i>Aphorisms.</i>		<i>Aphorisms.</i>	
11	I. 2. 8	22, 23	II. 8. 6, 31
13	III. 5. 4	28	II. 8. 19
16	I. 2. 10	29	II. 14. 3
19	II. 6. 18	31	II. 7. 32
20	I. 3. 33	34, 35	II. 6. 7
23	III. 4. 11	36	III. 4. 11
24	III. 4. 13, 14	38, 39	II. 3. 2
25	II. 8. 16, 42	40	II. 5. 2
26	V. 26. 26 A	43	II. 4. 5
28	II. 5. 2	44	II. 7. 27
32	II. 3. 3	46, 48	II. 6. 7
35	II. 3. 1; 4. 3	49	II. 6. 4
37	II. 13. 3	50	II. 6. 7
42	II. 8. 40	51	II. 5. 2
43	II. 8. 43	52, 53	II. 4. 3
44	II. 1. 23	54	III. 7. 2 D
49, 50	I. 3. 2	55	III. 5. 1
53	I. 3. 33	56	II. 5. 2
54	II. 1. 5	57	II. 8. 17-V. 26. 26 A
III. 1	II. 1. 2	58, 60	II. 8. 19
4	I. 3. 37	61	III. 4. 12, 14
5, 17	II. 1. 9, 10, 11	62, 64	III. 24. 1
6	II. 1. 15	68	II. 7. 27
7	II. 1. 12	71	III. 4. 14
8	II. 1. 4	72	II. 4. 8
9	II. 1. 2	75	II. 7. 11
10	II. 8. 24	76	II. 7. 12
11	II. 1. 13	79-81	II. 7. 12, 14
12	II. 1. 14-VI. 6. 1 B, C	82	II. 8. 20
13	II. 1. 15	V. 1	II. 6. 7
14	II. 1. 16	4	II. 8. 42
16	II. 1. 12	5	II. 6. 7
17	II. 1. 10-12	6	IV. 6. 1
18	II. 1. 17	7	II. 8. 11
19	II. Pr. 2	9	III. 22. 8
20	II. 1. 6	10	II. 7. 27, 28
21	II. 1. 7	11	II. 8. 24-III. 22. 3
22	II. 1. 8	12	II. 8. 24
23	II. 1. 9, 13, 17	13	II. 7. 6
24, 25	II. 1. 18-VI. 11. 3	14	III. 22. 14
26	II. 1. 19-IV. 24.	15	II. 7. 19; 8. 3
27	II. 1. 19	16	I. 9. 6
28	II. 1. 20	17, 23, 25	I. 9. 4; II. 1. 12; IV. 26.
29, 30	II. 1. 21	4	
31	II. 1. 22	20, 22, 25	I. 9. 4, 5
IV. 4	I. 3. 19	26	II. 18. 12
11	II. 7. 6	30	II. 6. 8
13	II. 13. 3	31	II. 10. 1
17	I. 3. 20	32, 33	II. 8. 16
21	II. 8. 43	34, 35	II. 7. 16

# PASSAGES IN HIPPOCRATES AND CELSUS

Hippocrates.	Celsus.	Hippocrates.	Celsus.
<i>Aphorisms.</i>		<i>Aphorisms.</i>	
37, 39	II. 8. 41	47	II. 8. 26
40	II. 7. 27	49	IV. 7. 1, 4
50	IV. 27. 1 D	52	II. 8. 17
52	II. 7. 16	71	III. 13. 20
64	III. 22. 10	80	IV. 11. 3
65	II. 7. 17		
66	V. 26. 26 A	<i>Prognostics,</i>	
VI. 8	III. 21. 2	vol. II.	
12	II. 7. 18	II.	II. 6. 1; 8. 25.
13	II. 8. 15	III.	II. 3. 1; 4. 1; 6. 5; 7. 24, 25
15	II. 8. 16	IV.	II. 6. 6
16	II. 8. 22	V.	II. 3. 1; 6. 6; 8. 35.
17	II. 8. 14	VI.	III. 20. 3
18	V. 26. 2	VII.	II. 3. 2; 4. 5; 5. 2; 6. 10; 7. 30, 31
20	II. 7. 21	VIII.	II. 3. 1, 3; 7. 28, 30, 31; 8. 4, 23
21	II. 8. 15	IX.	II. 7. 4; 8. 26
23	II. 7. 19-III. 25. 1	X.	II. 3. 1; 6. 6; 7. 36
26	II. 8. 16	XI.	II. 3. 1; 4. 1
27	II. 8. 27; 10. 12	XII.	II. 3. 4, 5, 6; 4. 9; 6. 12; 8. 35
28-30, 52	IV. 31. 1	XIII.	II. 3. 4; 4. 8; 5. 3; 6. 11; 7. 32; 8. 25
30	II. 8. 10	XIV.	II. 3. 4; 4. 7; 6. 10
31	VI. 6. 1 E	XV.	II. 3. 3; 8. 2, 22-IV. 5. 2
37	IV. 7. 1, 4	XVI.	II. 6. 9; 7. 33; 8. 2, 22
40	II. 8. 17	XVII.	II. 7. 34
42	II. 8. 34	XVIII.	II. 7. 35; 8. 4, 6, 23
43	II. 4. 5; 8. 34	XIX.	II. 7. 26, 31; 8. 5, 23
44	II. 8. 17, 35	XX.	II. 6. 6; 7. 22; 8. 1, 21
48	II. 8. 16	XXI.	II. 7. 8, 30; 8. 36. III. 4. 14. VI. 14. 1. VII. 10. 3
49	IV. 31. 8	XXIII.	II. 7. 26-VII. 12. 3
51, 52	II. 8. 25	XXIV.	cf. XX.
55	IV. 31. 2	<i>Regimen,</i>	
60	IV. 29. 2	vol. I.	
VII. 1, 3, 4	II. 4. 4	I.	I. 3. 34
6	II. 4. 9	IV.	I. 3. 16
9	II. 8. 42	V.	I. 3. 24
10	II. 8. 34. VII. 17. 17 A	VI.	I. 3. 32
11-14	II. 7. 28	vol. II.	
15	IV. 11. 3	LX.	I. 1. 1
16	II. 8. 24	<i>Airs,</i> vol. VI.	
17	II. 7. 17	IV. 45	VII. 17. 1
18-23	II. 7. 23		
25, 26	II. 8. 42		
31	II. 5. 3		
34	II. 5. 3; 7. 16		
37	II. 6. 10. IV. 11. 4		
42	III. 14. 1		
43	VII. <i>Pr.</i> 4		
44	VII. 3. 1		
45	II. 8. 3. IV. 15. 4		
46	VI. 6. 1 E		

# PASSAGES IN HIPPOCRATES AND CELSUS

Hippocrates.	Celsus.	Hippocrates.	Celsus.
<i>Breaths</i> , vol. II.		<i>Coan Prognostics</i> , vol. V.	
1	II. 9. 2	45	III. 4. 14
4	Pr. 15	402	II. 8. 22
6	I. 10.	430	II. 8. 24
12	VII. 15. 1	499	V. 26. 2
<i>Humours</i> , vol. IV.		<i>Affections</i> , vol. VI.	
11	Pr. 20	5	VII. 10
<i>Art</i> , vol. II.		22	VII. 15. 1
4	II. 8. 15	<i>Heart</i> , vol. IX	
13	V. 26. 1 O	12	IV. 6. 2
<i>Prorrhethics</i> , vol. V.		<i>Nature of Man</i> , vol. VI.	
I. 44	II. 7. 24	11 <i>Extra</i>	II. 10. 12
vol. IX.		<i>Haemorrhoids</i> , vol. VI.	
II. 4	II. 7. 11		VII. 30. 2 A
6	II. 8. 8, 9, 20	<i>Fistula</i> , vol. VI.	
7	II. 8. 6, 7, 24, 25		VII. 30. 1 B
8	II. 8. 10, 27	<i>Physician</i> , vol. IX.	
9	II. 8. 11, 29		II. 10. 5
14	II. 4. 7	<i>Ulcers</i> , vol. VI.	
17	II. 7. 10	26	II. 10. 19
18-20	VI. 6. 1	<i>Superfoetation</i> , vol. VIII.	
22	II. 8. 13, 30, 33. IV. 22	18	II. 7. 3
23	II. 8. 12, 14, 32. IV. 23	<i>Gynaecology</i> , vol. VIII.	
24, 30	II. 7. 7-36	I. 7	IV. 27. 1
31	II. 7. 3		
35, 36	II. 7. 20, 21, 28		
38-42	II. 8. 14-40		
<i>Epidemics</i> , vol. V.			
I. 23	Pr. 6		
V. 37, 38	VIII. 4. 3		
<i>Diseases</i> , vol. VI.			
I. 6	V. 26. 1 D		

## INDEX OF PROPER NAMES

### A

- ABELLA (Avella), in Campania, *Abel-lanae nuces* (*corylli*), hazel-nuts, I. 350
- Aesculapius, I. 2
- Africa, I. 234; scalping operations in, III. 354, note
- Agamemnon, I, 2
- Ajax, I, 300
- Albuele (vinum), I. 497
- Alexandria, Alexandrian, *calamus* (see list of *Medicamenta*), II. 56; green plaster, II, 38, 86, 110; surgeons at, II. viii; III. 296; voyage to, I. 328
- Allobroges, I. 497
- Aminaea, I. 444, 497
- Ammonius (Hammonius), an Alexandrian surgeon, fl. 3rd cent. B.C., known as Lithotomos as he was the first to perform the operation of breaking up stone in the bladder, III. 296, 438
- Andrias (Andreas) of Carystus, fl. 3rd cent. B.C., physician to Ptolemy Philopator; wrote on drugs, II. 2; described as an Asclepiad (cf. Galen, XIII. 343), prescriptions of, II. 18, 22, 208; inventor of an instrument for extending a dislocated thigh, III. 578
- Andron of Carystus, prescriptions of, II. 262, 272 (cf. Galen, XII. 984)
- Antigonus, probably A. Gonatas, King of Macedonia, d. 239, I. 312
- Antonius Musa, physician to Augustus, II. ix, lix
- Apollonius, there were many physicians of this name, to several of whom Celsus alludes; (1) A. Empiricus, fl. 3rd-2nd cent. B.C., perhaps = Apollonius Antiochenus. (There were two at Alexandria so named, a father and son, referred to by many writers) I. 6; (2) Apollonius Mys, probably = A. Herophilicus, author of several works who lived at Alexandria in the 1st cent. B.C., II. 2; (3) Two Alexandrian surgeons, perhaps the same as (1) (also referred to by Galen, XIV. 683), III. 296
- Apollonhanes of Seleucia, fl. 200. B.C., a physician at the court of Antiochus the Great, prescription of, II. 18
- Arabian (physician), II. 22
- Archagathus, fl. B.C., 220. The first professional Greek surgeon at Rome, where he introduced the writings of Hippocrates, Herophilus and Erasistratus; his predilection for surgery earned him the name of *Carnifex*. Prescription of, II. 42
- Aristogenes of Onidus, prescription of, II. 28
- Ariston, II. 30
- Asclepiades of Bithynia, c. 124-54 B.C. settled at Rome where he became the fashionable physician of his day and founded a school known as the Asclepiads; he is constantly referred to by Celsus, and also by Cicero, Pliny and other writers, I. 6, 10, 12, 16, 52, 58, 114, 168, 174, 180, 186, 230, 232, 236, 240, 258, 280, 290, 296, 316, 376, 386, 388, 394, 442; prescriptions of, II. xi, 2, 234
- Asclepius, the name of a salve, II. 214, 220
- Asia, I. 232, 458
- Assus (Troad), limestone from which acted as a preservative owing to the salt in it and was therefore used for coffins, II. 8, 218, also I. 458 and note
- Athenion, perhaps the follower of Erasistratus referred to by Soranus, *De Arte Obst.* 210, prescription of, II. 62

## INDEX OF PROPER NAMES

**Attalium** (*emplastrum*), probably called after Attalus Philometor, King of Pergamus, II. 36, 194  
**Attic**, ochre, II. 10, 24  
**Aufidius**, T. Auf. Siculus, I. ix  
**Augustus**, II. ix, lix

### B

**Baiae**, I. 184, 316, 499  
**Boethus**, inventor of a pessary, II, 48

### C

**Caesarianum**, name of a salve, II. 216  
**Campania** (*sertula*), see list of medicamenta s.v. *sertula*  
**Canopus**, salve named after, II. 214, 216  
**Cantabrica herba**, convolvulus, II. 120.  
 See *Medicamentas. v. scammonea*  
**Carystus**, Euboea, I. 6  
**Cassius**, a physician at Rome; possibly C. Iatrosophista or Felix; he wrote a Greek medical work and died shortly before Celsus wrote; the only Latin writer on medicine mentioned by Celsus, 120 (see Galen, XIII. 276, 277 and 286); I. ix, 36, 430; II. 64  
**Cannus**, on the coast of Caria, II. 48  
**Cheiron**, the centaur; a wound called after, II. 138 and note  
**Chrysippus** of Cnidus, fl. 350 B.C.; after visiting Egypt he founded a medical school at Cnidus, the most distinguished pupil of which was Erasistratus; I. 6, 312; his prescription for arthralgia, II. 28  
**Cilicia**, saffron from Mt. Korikos in, II. 56, 220  
**Cimolus**, one of the Cyclades, the soil of which was coloured by iron and copper (*Cimolia terra*), I. 212, 304; II. 4, 102, 124, 184; III. 534  
**Cleon**, an oculist, inventor of an eye salve, II. 194, 200, 204  
**Cleophrantus**, fl. 280 B.C., a Greek physician (also referred to by Pliny and Galen), I. 280  
**Clesiphon**, inventor of a wax poultice, II. 29 and note  
**Cnidus**, berries from, see *Medic. coccum*  
**Colophon**, resin from, II. 36  
**Cotoneum** (*malum*), see *Cydonia*  
**Craton**, prescription of, II. 232, 272

**Crete**, Cretan, birthwort, II. 20; wax, II. 28; wild carrot, II. 56; dittany, II. 64  
**Crustameria**, pears from, I. 204, 494  
**Cutiliae**, springs at, I. 499  
**Cydonia**, a town in Crete; *Cydonium* (*cotoneum*) *malum* = quince; see General Index s.v.  
**Cyprian marjoram**, sampsychnus, II. 10; for *Cyprius cinis*, II. 8, Cyprus ash. See list of *Medicamenta* s.v. *Cyprus*

### D

**Democritus**, of Abdera, the philosopher, fl. 460-370 B.C., I. 4, 114  
**Dexius**, prescription of, II. 30  
**Diocles** of Carystus, fl. 4th cent. B.C. practised in Athens, and was the master of Praxagoras; his anatomical observations were handed down, I. 4, 338, 426; II. 40, 110; *Cyathiscus*, instrument of, III. 318; on dislocation of femur, III. 578  
**Dionysius**, salve of, II. 194; caustic of, II. 286

### E

**Egypt**, I. 16; II. viii, see also Alexandria  
**Empedocles**, of Agrigentum, fl. 504-443 B.C., the philosopher, I. 4  
**Ephesus**, plaster named from, II. 40, 116  
**Epicurus**, fl. 342-270 B.C., the philosopher, I. 314  
**Erasistratus**, of Chios, fl. 3rd cent. B.C., one of the most celebrated anatomists and physicians of antiquity, lived at the court of Seleucus Nicator and later at Alexandria, I. 6, 12, 14, 26, 28, 30, 32, 232, 234, 268, 270, 272, 322, 394, 422, 426, 460; II. viii, 2, 232, 270  
**Eretrian earth** = alum, II. 10, 34, 180  
**Euelplides**, the most famous oculist of his day, recently dead when Celsus wrote (also mentioned by Scribonius Largus, 19-22 and Galen, XII. 767), II. 196, note b, 210, notes a and c, 214, note b, 218  
**Euelpistus**, fl. at Rome 1st cent. B.C. (probably the surgeon referred to by Scribonius Largus, 215), III. 296  
**Euthycleus**, poultice of, II. 28

# INDEX OF PROPER NAMES

## G

- Galen, II. viii  
 Gaul, I. 16; eye treatment in Transalpine G, III. 358; hunters' poison from, II. 114; spikenard from, III. 358  
 Glaucias, fl. 3rd or 2nd cent. B.C., an Empiric, famous for his commentaries on Hippocrates, perhaps the master of Heraclides of Tarentum, I. 6  
 Gnidium (*cocum*) see Cnidus  
 Gorgias, fl. c. 3rd cent. B.C., a surgeon at Alexandria, III. 296; his treatment of hernia, III. 376  
 Greece, I. 4; II. 354  
 Greeks, I. 2, 6, 10, 22, 88 bis, 90, 94 bis, 96 bis, 100, 118, 130, 140, 168, 170, 192, 212 bis, 218, 274, 288, 296, 302, 308, 312 bis, 316, 324 ter, 330, 342, 344, 358, 360, 362, 364, 368, 370, 376, 380, 384, 404, 408, 412, 416, 420, 430, 438, 458  
     II. ix, 6, 8, 12, 14, 16, 18, 24, 26, 28, 32, 34 bis, 36, 38, 40, 42 ter, 46, 82, 98 bis, 100, 104, 112, 118, 128, 132 bis, 158, 162, 164 bis, 166, 170, 180, 182, 200, 206, 216, 222 bis, 224, 250, 254, 256, 258, 268, 274, 276, 280, 284, 288  
     III. 310, 318, 326, 328 bis, 332 bis, 334, 342 bis, 344, 346 ter, 354, 366, 370, 372, 374, 390 bis, 392 ter, 394, 396, 398, 412, 422, 432, 454, 478 bis, 482 bis, 484, 486, 496, 500, 502  
 Greek terms distinguishing different species of sanies and pus, II. 76  
 Greek nut, sweet almond, see General Index *s.v.* almond and *Medicamenta I*, *s.v. nuces*  
 Greek wine, I. 260, 286, 340 bis, 346; varieties of, I. 498

## H

- Hecataeus, plaster of, II. 38, 108  
 Heraclides of Tarentum, fl. 3rd or 2nd cent. B.C., a younger contemporary of Apollonius and Glaucias and like them an Empiric, I. 6, 252, 282; II. 62; III. 334, 578. He wrote commentaries on Hippocrates' works on *Materia Medica* which are quoted by Galen and others  
 Heras of Cappadocia, 1st. cent. B.C., prescription of, II. 53, 139, 249

- Herodicus of Selymbria in Thrace, fl. 5th cent. B.C., said to have been the teacher of Hippocrates and one of the first to use exercise and gymnastics as treatment (cf. Hippocrates, I. xliii, IV. xlvj); II. viii  
 Heron, Alexandrian surgeon, probably fl. 3rd cent. B.C. (III. 297, his method of treating umbilical hernia, III. 379  
 Herophilus of Chalcedon, fl. 4th-3rd cent. B.C., one of the most famous physicians of antiquity, I. 6, 8, 14, 16, 268, 270; II. viii, 2; III. 346  
 Hierax, prescription of, for trachoma, II. 217 (also given by Galen, XII. 775)  
 Hippocrates of Cos, the Father of medicine, b. 460 B.C., I. 4, 8, 12, 16, 26, 36, 84, 236, 238, 268, 270, 338; II. 188; III. 294, 504, 528, 566, 570, 578, 584  
     For list of parallel passages in Hippocrates and Celsus, see App. pp. 624-7 and notes to Book VIII.  
 Homer, I. 3

## I

- Ilyrian, iris, II. 16, 20, 26, 54, 56 bis  
 Indian, spikenard, II. 56, 194, 200  
 Iollas, of Bithynia, contemporary of Heraclides of Tarentum and a writer on *materia medica*, prescription of, II. 52  
 Irenaeus, plaster of, II. 174  
 Italy, Italians, I. 210, 316, 328; II. 120  
 Iudaeus, a Jewish physician (or a proper name), prescription of, II. 36, 52

## L

- Laconian (bath), I. 52, 184, 314.  
     See index *s.v. bath*  
 Lemnian earth, II. 45. See *Medicamenta s.v. alum*  
 Lycian stone, II. 218; for *lycium* (boxthorn juice). See list of *Medicamenta*  
 Lysias, poultice of, II. 18

## M

- Macedonian iris, II. 28  
 Machaon (son of Aesculapius), I. 3  
 Maevianum, name of a pear (called

## INDEX OF PROPER NAMES

- after a man Maevius ?), I. 204, 494
- Medius, poultice of, II. 22
- Meges, of Sidon, fl. 1st cent. B.C., practised as a surgeon in Rome, where he was much esteemed, II. 140, 154; III. 296, 300, 334, 376, 436, 582
- Melos (Milo), one of the Cyclades, alum from, II. 2, 288
- Menemachus, originator of an application for toothache, II. 250
- Menophilus, originator of an application for earache, II. 232
- Metrodorus, of Lampsacus, a distinguished philosopher, pupil and friend of Epicurus; treated for tympanites, I. 314
- Mithridates VI. Eupator (132-63 B.C.), King of Pontus. His antidote, II. 56
- Moschus, poultice of, II. 20
- Musa, Antonius. See Antonius M.
- Myron, prescription of, II. 172, 174
- Mys, see Apollonius
- N
- Nicon, perhaps a physician mentioned by Cicero (*ad Fam.* VII. 20) in 45 B.C., inventor of a poultice, II. 22, 28
- Nileus, eye salve of, II. 201; wrote on dislocations, III. 578
- Numenius, perhaps of Heraclea, 3rd cent. B.C., a pupil of Diocles; his poultice for gout, II. 30; his pessary, II. 48
- Nymphodorus, a Greek surgeon, referred to by Heraclides of Tarentum; inventor of an instrument *glossocomeion* for the reduction of fractures and dislocation, III. 578 (*γλωσσοκομείον*, Galen, III. 573)
- O
- Orestes, I. 300
- P
- Pantaenus, poultice of, II. 22
- Pasteur, II. viii
- Persian (apple) = peach, I. 494; II. 231
- Petron of Aegina, fl. 4th cent. B.C., I. 268, note; II. x.
- Philaethus, salve of, II. 204, 212
- Philinus of Cos, fl. 3rd cent. B.C. reputed founder of the Empiric school, II. viii
- Philip of Epirus, physician to King Antigonus (? Gonatas), I. 314
- Philo, perhaps P. of Tarsus, fl. 1st cent. B.C., author of a famous antidote referred to by Galen and other writers, prescription for his eye salve, II. 194
- Philocrates, plaster of, II. 38, 108
- Philotas, probably P. of Amphissa, fl. last half of 1st cent. B.C., prescription of, II. 34, and note
- Philoxenus (called Claudius Ph. by Galen, XIII. 539, 645), an Alexandrian surgeon of the 1st cent. B.C., III. 294
- Phrygian stone = rock alum (used by dyers in Phrygia, Dioscorides, V. 915)
- Phylotimus (or Philotimus), pupil of Praxagoras and contemporary of Erasistratus, referred to by Galen (XVIII. i. 731, 735), II. 9, 219; he was able to relieve hip dislocation, III. 578
- Plistonicus, fl. 4th or 3rd cent. B.C. also a pupil of Praxagoras, and a well known physician, referred to by Galen, XV. 135, and Pliny, *N.H.* XX. fin.; I. 12
- Podalirius, son of Aesculapius, I. 3
- Polyarchus, poultice of, II. 20; III. 533
- Polyidus, inventor of the pastil "sphragis," II. 45, 87, 235, also given by Galen, XIII. 834
- Pontus, root from (*Pontica radix*) = rhubarb
- Praxagoras of Cos, fl. 4th cent. B.C., a member of the medical sect known as *Dogmatici*, master of Philotimus etc., I. 6, 12
- Protarchus, plaster of, II. 24, 168, 170; III. 578
- Psylli, a North African tribe, II. 114 and note
- Ptolemaeus, the King (uncertain which), II. 55. See Zopyrus, *infra* cf. II. viii.
- an Alexandrian surgeon, prescription of (ear drops), II. 232
- Punic (apple) = pomegranate *q.v.*
- Pythagoras, of Samos, fl. end of 6th cent. B.C., the philosopher, discussion of his theory of numbers, I. 436, note

## INDEX OF PROPER NAMES

### R

Rhaetian wine, from the Rhaetian Alps, N. of Verona, I. 402, 498  
 Rome, I. 16, 44; III. 296

### S

Samos, earth from, II. 204 and note  
 Scandian apples, I. 204, 442, 494  
 Serapion, an Alexandrian surgeon, an empiric, fl. end of 3rd cent. B.C., often referred to by later writers (Galen, X. 142, XIV. 683), I. 6; (?) the author of a remedy for scabies, II. 170  
 Sicilian (saffron), II. 214  
 Signia (mod. Segni, S.E. of Rome), pears from, I. 204, 442, 494; wine from, I. 402, 444, 498 (noted by Pliny, *N.H.* XIV. 6, as an astringent in cases of diarrhoea)  
 Simbrivius (lake), see Sumbruina  
 Sinope, red lead (*minium*) from (brought to S. from caves in Cappadocia). See *Medicamenta* s.v. *minium*  
 Sosagoras, emollient of, II. 29.  
 Sostratus of Alexandria, fl. 1st cent. B.C., a famous surgeon, often referred to by later writers (Athenaeus, *Deip.*, VI. 66, 99), III. 296, 376  
 Sumbruina, springs of (perhaps = Lake Simbrivius in Latium referred to by Tacitus, *Ann.* 14, 22), I. 403, 499  
 Susa (Shushan), unguent made from lilies at, II. 18  
 Syrian oil = nard, I. 378

### T

Tarentum, see Heraclides; pears from, I. 204, 494

Tharrias, a writer on phrenesis, I. 320  
 Themison of Laodicea, a pupil of Asclepiades, fl. 1st cent. B.C., the founder of the sect of the *Methodici*, I. 6, 30, 32, 34, 232, 240, 432; (?) prescription of, II. 230  
 Theodotus, oculist, eye salve of, II. 195, (also given by Galen, XII. 754 and Paulus Aeg. VII. 16)  
 Theoxenus, plaster of, II. 30  
 Timaeus, prescription of, II. 52  
 Tryphon, perhaps of Gortyna in Crete, fl. 1st cent. B.C. who practised as a surgeon in Rome; referred to by Celsus as *Tryphon pater* and by Galen (XIII. 745) as *Τρύφων ὁ ἀρχαῖος*, so there was probably a second of the same name, II. 184; III. 296

### V

Vettonica (*herba*) = betony, found among the Spanish tribe Vettones, II. 120

### Z

Zeno, probably a contemporary of Apollonius the Empiric (3rd cent. B.C.); he paid special attention to *materia medica*, II. 3  
 Zopyrus, a surgeon at Alexandria at the beginning of the 1st cent. B.C. who invented an antidote for Mithridates and for one of the Ptolemies; he is referred to by many writers on medicine, (e.g. Galen. XIV. 150, 205), II. 55, note

## GENERAL INDEX \*

### A

- Abdomen (hypogastrium) I. 100, note, 103, 129, 313, 339, 357, note, 363, 449; II. 77; III. 459; operations on, III. 377-91; rupture of, III. 389; wounds of, I. 23; III. 385; see also *praecordia*
- Abscess, abscession, I. 30, note, 89, note *b*, 127, 129-133, 155, 351, note, 413, 453; II. 7, 17, 19, 21, 25, 145-9; III. 299-307
- Abstinence (fasting), (1) total, I. 19, 23, 49, 51, 73, 79, 183, 233, 225, 235, 277, 283 ff., 299, 313, 399; II. 229  
(2) partial, I. 23, 41, 65, 343; II. 91; III. 517, 587
- Acme, see fever
- Acrochordon (a sort of wart), I. 93, note *b*; II. 161, 163
- Adolescents, I. 39, 65, 95, 119, 189; II. 71
- Aegilops, III. 335, note *b* (see eye)
- Air, I. 45, 265, 305, 411; intestines should not be exposed to, III. 385
- Age, I. 65, 85, 89, 93, 97, 157, 361; II. 71, 409, 427, 569; old age, I. 65, 95, 97, 129, 157; II. 71, 101, 221; III. 349, 425
- Agriculture, I. 3
- Aliments, description of, I. 191-215; appendix on, I. 483 ff.
- Almonds, sweet and bitter, I. 215, 271, 317, 341, 351, 389, 391, 419, 459, 495; external use, II. 9-13, 51, 167, 184, 229, 233, 241, 257; oil, I. 496; see also *Medicamenta I, nuces*
- Alphos, II. 173 and note, 172
- Amphora, I. 311 and note
- Amputation, II. 107; III. 469-71, 549
- Anastomosis, (1) flow of blood, I. 393; see blood (2)  
(2) see pores and II. 6 (*Medicamenta quae stomata aperiunt*)
- Anatomy, (1) methods of studying, I. 15-25, 41  
(2) bones and teeth, III. 475-93; eye, III. 347; genitals, III. 475-93; viscera, I. 355-63; see also III., appendix, 593-601
- Ancylae, II. 29 and note
- Ancyloblepharus, III. 333, note *b*
- Angina, I. 381, note, see also quinsy
- Ankle, III. 491, 601; dislocation of, 583 and note; venesection above, I. 163, 321, II. 279; inflammation at, III. 559
- Anodynes, I. 211; II. 57, 59, 191, see Vol. I. *Medicamenta* (esp. *hyocyamus, mandragora, papaver, solanum*)
- Anointing, see Inunction
- Anus, anatomy of, I. 359, 361; condyloma, II. 283; III. 463; fissures, II. 281; application for, II. 47; III. 463; fistula in ano, III. 311; haemorrhoids, I. 97, 125, 139; II. 47, 285; prolapse, II. 287; surgery, III. 461 ff.
- Ape, bite of, II. 111

\* Food stuffs, herbs and drugs used in prescriptions are included in the list of *Medicamenta* given in the Introduction to Vol. II (*Medicamenta I*), which also contains a list of surgical instruments (*Medicamenta II*), and of weights, measures and symbols.

## GENERAL INDEX

- Aphtha, I. 95 note, II. 257; see also *canem oris*
- Apoplexy, I. 345, note
- Apples, I. 49, 205, 213, 443, for varieties, 494
- Arachnoid membrane (retina), III. 347, note, see eye
- Area Celsi, II. 183, note
- Arm, see forearm and humerus; bleeding from, I. 155-65; exercise of, I. 47, 349
- Arquatus morbus, see jaundice
- Arrow, arrowhead, removal of, III. 317, 319
- Arteries, regarded by Celsus as air passages to all parts of the body, I. 9; unsuitable to hold blood, I. 9, 33; *vena* = an artery in the modern sense, I. 155 ff.; C. notes violent bleeding when an *arteria* is cut, I. 163 and the throbbing of some *venae* (i.e. arteries), I. 105, 157; special arteries (*venae*) referred to are axillary and popliteal, II. 69, brachial, basilic, I. 163; carotid, I. 355, II. 69; spermatic, II. 69; III. 391; temporal (arteriotomy), III. 359
- Arteria aspera, trachea and lungs, I. 73, 355-7; III. 375; for *arteriace*, a remedy, see *Medicamenta I*
- Artichoke, I. 491
- Ascites, see dropsy, especially I. 119, note
- Asp, II. 117, note
- Asparagus, I. 195, 201, 203, 209, 211, 491
- Ass, wild, I. 193, 485; domesticated, milk of, I. 169, 485; II. 123
- Asthma, I. 385, note
- Astringents, I. 37, 65, 209, 433, 445, 453; II. 281; see *Medicamenta*, esp. *alum*, *lycium*, *polygonum*
- Atheromata, III. 323
- Aurata (fish), I. 195, 487
- Autopyrus, whole-meal, I. 193, 489
- Autumn, I. 67, 87, 89, 151, 153; II. 71; III. 333
- Axilla, III. 469, 571
- B
- Bacon, I. 195, note, 197, 485
- Baldness, II. 179-183
- Ball (missile), III. 321; (play with), I. 47, 73, 75, 349
- Bandages, see *Medicamenta II*, *fascia*
- Barley, I. 193, 205, 489; II. 19; barley porridge, *polenta*, I. 307, 423; *putlicula*, I. 197, 203, 209; gruel, I. 173, 197, 201, 203, 407; in a poultice, I. 349; for the tumour called barley-corn (*krithe*), see Eye
- Bass (fish), I. 195, 201, 487
- Baths, I. 43, 49, 53, note, 187-91, 225, 69, 75, 79, 185, note, 187-91, 225, 255, 261, 277-85, 317, 327-331, 347, 367, 373, 375, 399, 403, 415, 423, 429, 441, 451, 457; II. 97, 107, 113, 123, 137, 165, 175, 189, 199, 207, 211, 223, 257, 317; III. 315, 519; see also *solium*
- Beans, I. 193, 201, 490; as a poultice, I. 215; II. 25. The Egyptian bean as a measure of size, II. 57, 63, 65, 121, 161; the embryo tastes like a bitter almond, II. 231, 233
- Beard (disease of), II. 181
- Beef, I. 195, 203, 207, 484; ox gall, 383; spleen, 411; suet, 449
- Beet, I. 195, 201, 203, 209, 341, 417, 491; the leaves as a topical application, II. 103
- Belly, I. 23, 357, 421
- Biceps (*lacetus*), III. 545, note, see also 549, 575 (this is the only muscle to which Celsus gives a name)
- Birds, birding, I. 193, 195, 203, 207, 209, 486; II. 137; birds' blood as a remedy, II. 7, 227
- Bites, II. 41, 111, 121
- Blackbird, I. 209, 486
- Blackberries (bramble), I. 213, 305, 437, 445, 495
- Bladder, anatomy of, I. 361; see also, 121-3, 133, 141, 451; II. 29, 47, 67, 279; III. 425 ff.; wound of, II. 77; see also, calculus; gall bladder, I. 357; inflated bladders, beating with, I. 321, 349; cysts to which the name "bladders" (*vesicae*) was given, III. 325
- Blade bones, see Scapula
- Bleeding, see blood (4) and haemorrhage
- Blindness, see eye; night blindness, II. 225, note

## GENERAL INDEX

- Blood (1) as a remedy, I. 339; II. 7, 227  
 (2) passes from veins to arteries (anastomosis), I. 9, 33  
 (3) Blood and blood clot in urine, I. 123, 393; III. 425, 441, 447; in wounds, II. 85; III. 403, 407; in struma, II. 141; pressing on brain, III. 507, 515  
 (4) Blood-letting, indications for, I. 159; methods of, 155-169, contra-indicated, 155 ff. for blood letting, see also, I. 263, 267; III. 299, 319-321, 329, 337-9, 343, 345, 365, 367, 385, 391-7, 405, 409, 427, 449, 451-455; after bites, II. 103, 113 ff.; relief by haemorrhage, I. 393  
 (5) Suppression of bleeding by drugs, II. 5  
 For blood vessels see arteries, also I. 13, 21; vomit of blood, I. 37; see also haemoptysis, haemorrhage, haematuria  
 Blow, II. 129, 227; III. 349, 389, 503 ff., 511  
 Body, how to make fat or thin, hot or cold, etc., I. 57-63; constricted or relaxed, I. 31; in fever, I. 259.  
 Boil (*furunculus*), II. 143, 159  
 Bolus, see *Medicamenta I*, s.v. *catapotlum*  
 Bougie, see *Medicamenta II*, s.v. *collyrium*  
 Bowels, affected by food, I. 203; see intestine  
 Brain, injury to, II. 69, 75; operations on, III. 493, 497 ff.; for disease of, see insanity; brains as food, I. 197, 203  
 Bread, I. 191, 193, 197, 201, 203, 205, 209, 257, note, 307, 381, 397, 423, 433, 441, 488, 489; II. 137  
 Bream, I. 195, 207, 487  
 Breast, I. 123, 127, 153; treatment with cautery, 331; by cupping under, 449; cancer of, II. 129; III. 592  
 Breath, (1) *spiritus* = *pneuma*, I. 9, note, 171, 355  
 (2) Breathing, I. 11, 21, 23, 25, 101, 311, 345; III. 305  
 Holding breath, III. 379, 381; dyspnoea, I. 21, 97, 103, 111, 127, 131, 151, 341, 385, 409, 425; II. 61, 73; III. 305  
 (3) for *spiritus* = flatulence, see s.v.  
 Bronchocele, III. 375, note  
 Broth, I. 197, 203, 257, 275, 297, 331  
 Bubonocele, III. 399  
 Bulbs, I. 193, 201, 203, 490, 493; II. 5  
 Burns, treatment of, II. 125  
 Butter, I. 333, 433, 439, 485; used externally, II. 11, 13, 271, 275; III. 515
- C
- Cabbage, I. 195, 201, 203, 207, 209, 213, 438, 491  
 Cachexia, I. 97, 159 (*malus habitus corporis*), 325, 329  
 Cacoethes malignant, II. 129, 131, note; III. 592; = Latin *vitiosus*, III. 379, note a  
 Caecum, see intestine  
 Calculus (stone in bladder), I. 123; II. 47; III. 425 ff.; operation for, 427-439; in women, 439-441; after treatment, 441-455; see also bladder  
 Calf (of the leg), I. 343; calf bone (fibula), III. 491, 559, 601  
 Calf (veal), as food, I. 203, 485; veal broth, II. 117; fat in prescriptions, II. 19, 35, 43, 49, 59; III. 445  
 Callus (1) osteophyte, I. 137, 147; uniting fractures, III. 511, 549; coat of an abscess, III. 301; a callous fistula, II. 149, 157; callosity on penis, II. 279; in joints, II. 31; callous ulcer, II. 181  
 Cancer, see carcinoma  
 Cancrum oris, II. 257; III. 591  
 Canker, I. 89, note, 91; II. 47, 53, 67, 97, 99-101, 133, 275-7; III. 449, 493, 549 and App. 589 ff.  
 Canthus, II. 203; III. 333, note; see eye  
 Capers, I. 193, 209, 211, 385, 453, 491  
 Carbuncle, II. 125, 279, note; *carb. oculi* = *stye*, II. 203  
 Carcinoma (carcinode), II. 25, 27, 129-133, 247; III. 337, note a, 379, 589 ff.  
 Cardiacus (*morbis*), I. 299, note b, 302, note, 303-9  
 Caries, II. 151; III. 337, 495, 497, 499

## GENERAL INDEX

- Cataract, see eye
- Catarrh, a running cold, *catastagnus* or *destillatio*, I. 329, 371-5; see also, *gravedo*
- Catheter, see *Medicamenta II*, s.v. *fistula*
- Cautery, I. 191, 319, 331, 379, 415, 455; II. 105, 113, 125, 127, 131 ff., 291; III. 337, 357
- Celery, see *Medicamenta I*, *apium*.
- Cerastes, II. 119, note
- Cheek bones, I. 131; III. 478; fracture of, III. 531, see also jaw (upper)
- Cheese, I. 193, 201, 205, 207, 415, 485; external use, II. 259
- Cheliragra, I. 463-5, see also *podagra*
- Chelydrus, II. 121
- Cherry, I. 173, 205, 209, 493, 494
- Chest, inflammation in, I. 273; pain in, II. 63; see also *praecordia*
- Chicken (broth), I. 247; as a food, see poultry
- Chicory, I. 209, 491
- Child, I. 93, 95, 119, 141, 147, 157; II. 65, 71; III. 381, 409, 415, 425-53; children's diseases, I. 65, 95, 137, 263; III. 439
- Chilblains, II. 139, note
- Cholera, I. 97, 173, note, 421, note
- Chordapsos (intestinal cramp), I. 427
- Circumcision, III. 421
- Cirsocele, III. 397, note, 415
- Clavicle, anatomy of, III. 485, 597, 598; fracture of, 527 ff.
- Clavus, (1) (small tumour on eye), III. 345  
(2) trephine pin, III. 497  
See also corn
- Clibanus (dry oven), I. 185, note, 315
- Clyster, (1) I. 169, 231, 259, 263, 281 ff., 319, 327, 341, 345, 365, 369, 379, 399 ff., 427-9; II. 263; III. 333, 443  
(2) = syringe, see *Medicamenta II*, s.v.
- Coeliacus (*morbus*), perhaps pyloric spasm, I. 425, note
- Cold, I. 39, 45, 51; effect on body, I. 77, 91-3; common cold infection, see *gravedo*; cooling foods, etc., I. 207, 213
- Colic, I. 427, see also intestine; pill for, II. 65; for *colicos* (a medicine), see *Medicamenta I*
- Collyrium, (1) salve, especially eye salve, II. 155, note, 193-7, 201, 217; III. 307  
(2) tent, or bougie, used to probe a fistula, see *Medicamenta II* and II, 155, note
- Colon, anatomy of, I. 359; inflation of, I. 75; disease of, I. 171, 427; see also, intestine
- Coluber, II. 119, note
- Comitialis (*morbus*), I. 333, note; see epilepsy
- Compounding (of medicines), II. 13 ff., 49 ff.; see also Vol. II. Introduction
- Concoction, (1) = digestion, q.v.  
(2) = maturing of abscesses, see abscess; medicine to secure this, II. 7
- Concubitus, I. 39, 43 ff., 67, 69, 77, 97, 323, 335, 349, 373, 383; II. 71; III. 423, 453
- Conditia, I. 49, note
- Condyloma, II. 129, 283; III. 463
- Conjunctivitis, see eye
- Constipation, I. 31, note b, 67, 420, note; constipating foods, I. 209
- Consumption (phthisis), I. 37, 125, 135, 141-5, 183, 325, note
- Convalescence, I. 115, 461
- Corn (callosity on foot, *clavus*), II. 163, note a
- Corvus, (1), a fish, I. 487  
(2), a surgical knife, III. 405
- Coryza, common cold infection, see *gravedo*
- Cough, I. 131, 267, 327, 331 ff., 385, 389-395, 405, 407, 409; II. 63, 65; with haemoptysis, I. 391; after a broken rib, III. 533
- Crane, I. 193, 486
- Cremasters, III. 391, note, 403, 413
- Crisis, I. 237, note
- Crystalline lens, III. 349
- Cucumber, see gourd
- Cubitus, see elbow and ulna
- Cups (for bleeding), I. 165 ff.; dry cupping, I. 167-9, 319, 347, 367, 379, 381, 391, 399, 409, 423, 427, 431, 449; for bites, II. 111-115; III. 299 ff., for bleeding, see blood
- Cyathus, (1) a measure ( $\frac{1}{4}$  sextarius), I. 298, note  
(2) a cup, I. 269, 275, 333; II. 17, 19, 37

## GENERAL INDEX

Cynanche, see angina  
 Cysts, on eyes, see eye; III. 325 ff.; on head, III. 323

### D

Dartos, III. 393, note, 401  
 Dates, I. 49, 195, 201, 205, 211, 213, 389, 445, 493; external use, II. 55  
 Deafness, II. 237, see ear  
 Death, signs of approaching, I. 109, 111, 125; recovery of apparently dead, I. 115  
 Deer, I. 193, 485; marrow of, I. 433, 449; powdered horn of, see *Medicamenta I, cornu cervinum*  
 Defaecation (stool, *alvus*), I. 63; also I. 31, 37, 53, 57, 65, 73, 91, 101, 107, 135, 141, 147, 153, 169, 301; foods that move or confine the bowels, I. 209  
 Delirium, I. 105, 111, 127, 149, 303; II. 229; III. 517; distinguished from insanity, I. 289  
 Dementia, I. 153, 289  
 Dessert, I. 49  
 Diabetes, I. 451, note a  
 Diabrosis, I. 393  
 Diagnosis (*cognitio*), I. 7, 15, 155, 199  
 Diaphragm, I. 23, 131, 357; II. 69, 77; III. 309  
 Diarrhoea, I. 30, note, 37, 125, 137, 139, 147, 421, 441-7 and note; see dysentery  
 Diaphoretics, see sweat  
 Diet, dietetic art, I. 7, 13; wide meaning of, II. 3, note; see aliments  
 Digestion, I. 13, 21, 45-9, 75-9, 161, 231, 199, 201, 403, 431; III. 449; foods of good or bad juice (*chyle*), I. 199-205  
 Diploe, described, III. 475, 593  
 Dipsas, II. 119 note  
 Disease, causes of, I. 11, 29, 33; acute or chronic, I. 31, 219 ff.  
 Dislocations, III. 559-587; see also, 299, note c; accompanied by wounds, 585 ff.  
 Dispersal (of morbid matter), I. 31 and note c, 177, 215, 351; II. 17 ff., 147; III. 501  
 Dissection, utility of discussed, I. 15, 23-5, 41; II. viii  
 Diuretics, I. 53, 211, 317, 497

Dog, mad, see hydrophobia; bite of, II. 111, 113  
 Dogmatic school (of medicine), I. ix, 9 ff.  
 Dove, I. 486, II. 227  
 Dressings, see *Medicamenta*, s.v. *fascea, lana, linum*  
 Drill (as an exercise), I. 47, 75  
 Drink, cold drink bad when fatigued, I. 53; in malaria, I. 251  
 Dropsy, different varieties and their treatment described, I. 119, note a, 313-323; see also I. 89, 135, 145, 149, 183; relieved by paracentesis, III. 383  
 Dung, in prescriptions, II. 7, 9, 11, 23  
 Dysentery, I. 30, note, 37, 91, 93, 113, 129, 137, 147, 149, 199, 431, 441; II. 53, 61, 253  
 Dyspnoea, see breath (2)  
 Dysuria, see strangury

### E

Ear, I. 89, 127; II. 63; III. 477, 479  
 diseases of, II. 227-243; earache II. 229; deafness, I. 141; ringing in, II. 239; suppurative ulceration in, II. 45, 231 ff.; surgery of; III. 357-361; syringe, see clyster; foreign body in, II. 241-3; wax in, II. 237; rupture of cartilage of, III. 523  
 Ear of pig (chaps), I. 197, 203  
 Earth eaters, I. 117, note  
 Ecchymosis (*luxata*), III. 299, note c; see also, II. 27  
 Ectropion, see eye  
 Eczema, II. 178, note b  
 Egg, I. 197, 201-205, 207, 209, 375, 381, 391, 411, 433, 441, 453, 487; II. 5, 7, 13, 287  
 Eileos (intestinal disease), I. 101, note b  
 Elbow, III. 487, 598; fracture of, III. 545, 547; dislocation of, III. 573, 574, note, 585  
 Elements, I. 9, note  
 Elephantiasis, I. 343 and note  
 Emetics, I. 59, 61, 73; see also vomit  
 Emollients, see *Medicamenta I*, s.v. *malagma*  
 Emphysema, I. 167 and note, 398, note

## GENERAL INDEX

- Empiric school (of medicine), I. ix, 7, 15 ff., 35, 367, 443; II. 3
- Encanthis, III. 333, note
- Endive, I. 203, 205-209, 213, 331, 416, 491
- Enema, materials for and method of administering, I. 169-173; see also clyster; nutrient enema (*alvus trophicus*), I. 307, note, 433
- Enterocoele (hernia), III. 393, 409
- Epidermis, II. 39, 125, 127, 141, 167
- Epiglottis, I. 355, note c
- Epilepsy, I. 333 and note, 339, for description and treatment; see also, I. 89, 91, 93, 137, 147, 173, 183
- Epinyctis, II. 165, note
- Epiplocele (hernia), III. 393, 413
- Epistaxis, see hæmorrhage (nasal)
- Eruption, I. 151, 155; II. 163, note; in wasting diseases; III. 325
- Erysipelas, II. 99, 103, 147; III. 589, 590
- Euchylos (of foodstuffs), see digestion
- Eukrasia, I. 100, note
- Evacuants, see purgatives
- Excision; of carcinoma, II. 131; of bone, III. 497 ff.; of foreign bodies, III. 317 ff., see also fistula, surgery of, III. 307 ff.
- Exercise, I. 41, 47, 49, 55, 73, 183, 225, 323; on horseback, I. 443, 455; running, I. 47, 59, 315, 343, 369; walking, I. 43, 47, 55, 315, 327, 337, 341, 349, 375, 387, 389; of upper limbs, I. 389, 399, 403; with ball, see ball and drill
- Experience, I. 17, 21, 27; see empiric
- Eye, (1) anatomy of, III. 347-9 and notes; describing coats of eye, corneal, sclerotic, choroid, the iris pierced by pupil, arachnoid (retina); and humours of eye, hyaloid or vitreous, and crystalline (lens); see also, III. 477
- (2) Vision; dimness of, I. 63, 129, 139, 363; II. 221; at dusk (night blindness), II. 225, note; mydriasis, II. 225; affected by paralysis, II. 223
- (3) Inflammation of eye (*Lippitudo* or ophthalmia), I. 17, 71, 121, 139; for description of disease and its treatment, II. 185, ff. 217; eye salves for, II. 191 ff., operations on scalp for, III. 353 and note; leads to trachoma (*aspritudo*), II. 185, 215-27; III. 353; complicated by suppuration of eyeball, II. 187-91, 203
- (4) Cataract (*suffusio*), II. 223, note; operation for (couching), III. 345-353, notes and diagram
- (5) Diseases of eyelids, lashes and surface of eye; lacrimal fistulas (rhyas and aegilops), III. 331, 334, note; cysts or tumours at angle (canthus) of eye and on eyelids, II. 203 (stye, *carbunculus*), III. 326 (*crithe* or meibomian cyst), 320 (*pterygium* or *unguis* and *chalazia*), 333, note (*encanthis*); scabrous eyes, II. 219; eyelashes (*cilia*), operation on, III. 337-43; eyelids, adhesion of, 333-5; operation on, 339; turning outwards of (ectropion), 343; lice on (*phthiriasis*), II. 207; *lagophthalmos*, III. 342, note; eyeball, proptosis of, II. 201, note, see also, III. 341-5; shrinkage of, II. 207; staphyloma on, III. 345, note and diagrams; *Clavi*, 345; blow on eye, II. 227
- (6) Eye symptoms in other diseases, I. 127 (insanity), see also, I. 99, 109, 131
- (7) Eye salves, II. 155, 193-7 and general treatment for eye diseases, II. 197-201
- Eye-fish, I. 195, 487

### F

- Faintness (syncope), I. 302, note, 307 421, 469
- Fasting, see abstinence
- Fat, I. 485; fat meat, I. 203, 209; lard, I. 193, 265, 459; ox suet, I. 209, 211; fat in a nutrient enema, I. 433; fat in prescriptions, II. 7, 11, 43, 45, 49, 59, 87
- Fatigue, I. 39, 45, 49, 51, 55, 99, 139
- Femur, anatomy of, III. 489, 600; fracture of, III. 539, 547; dislocation of, 577-581
- Fever, I. 11, 19, 89, 99, 127, 139, 141, 159, 161 181, 185-9, 257, 265-409; acme of, I. 103, 169; irregular course of, I. 89; ardent

## GENERAL INDEX

- fever, I. 141, 229; 265; III. 419; premonitory signs of, I. 117, 231, 235, 273; long, I. 91, 95; continuous, I. 89, 267; malaria (*febris circuitus*) and its treatment described, I. 227-289; paroxysms of, I. 109, 223, 243, 245, 257, 265, 289; critical periods of, I. 237, note; quartan, quotidian and tertiary, I. 89, 153, 227, 237, 267; remissions of, I. 19, 249; rigor accompanying, I. 37, 91, 125, 129, 135, 229, 339, 375, 413; when to give food in, I. 231 ff.
- Fibula, (1) calf bone, called *sura*, III. 601, note  
 (2) clips or pins for wounds, see *Medicamenta II*
- Fig, I. 195, 205-9, 213, 391, 411, 425, 494; commonly used in external applications, I. 321, 343, 379, 383; II. xiii, 9, 11, 29, 31, 131, 147, 159, 163, 221, 249; III. 557
- Fig pecker, I. 195, 486
- Finger (*digitus*, the term including toes and thumbs, III. 493); anatomy of, III. 489, 599; fracture of, III. 549; dislocation of, III. 575, 577; diseases of, I. 343; II. 289; III. 469; wound of, II. 69
- Fish, I. 193, 195, 197, 201, 203-9, 411, 453, 487; salt fish, 417; fish pickle and sauce (*salsamentum* and *garum*), I. 488
- Fistula, (1) anatomical, see urethra  
 (2) pathological, II. 149-59, 281; surgery of, III. 307 ff., 453; nasal, 335; perineal, 433, 453; frontal, 519; lacrimal, 331  
 (3) pipe, tube, see *Medicamenta II*
- Flamingo, I. 193, 486
- Flatulence (*flatus*, intestinal gas), I. 63, 75, 103, 137, 161, 171, 319, 397, 399, 425, 429; II. 379, 385, 395, 409; effect of food on, I. 205-7
- Flesh (of body),  
 (1) normal, I. 135; II. 71, 151; III. 383, 389, 477  
 (2) diseased, "granulations," II. 101, 289; III. 343, 447, 503; in bronchocele, 375; in nasal polypus, II. 245; omentum in hernia, III. 377; flesh forming drugs, II. 11; growth of new flesh after wounds, II. 97; III. 307
- Foetus and membranes, removal of, III. 455-461; expulsion of dead foetus, II. 49, 65
- Foot, anatomy of, III. 491, 493, 531, 601; dislocation of bones in, III. 583, 585; gangrene of, I. 133; II. 21; injury to, III. 583, 585; pain in, II. 21, 31
- Food, when to give it in malaria, I. 233 ff., 241 ff.; see aliments
- Foramen (of bone), III. 366, 477; also = pupil of eye, III. 347 and "pore" of Erasistratus, I. 11
- Forearm (*brachium*), anatomy of, III. 485-7, 599; fracture of, 545 ff.; dislocation of, 573; see also, I. 103, 163, 255, 297
- Forehead, I. 99, 121, 139; III. 475-7, 517, 593
- Fractures, described, III. 503 ff., 523 ff., 537; of skull, 503-519; of nose, 521, of jaw, 523 ff.; of clavicle, 527, 529; of ribs, 531-5; of spine, 535; of legs and arms, 527 ff.; of fingers, 529
- Freckle (*ephelis*), II. 183
- Frenum, III. 423
- Fruit, I. 193, 209, 493 ff.; orchard fruit, I. 49, 67, 193, 201-7, 259, 265, 419, 443
- Fruментy, I. 201, 389
- Fungi, treatment for poisoning by, II. 123; ulceration like, III. 587

### G

- Gall bladder, see bladder
- Gargle, I. 367; II. 53
- Ganglion, II. 323, note, 325
- Gangrene, I. 27, 91; II. 45, 101, 103, 105, 263-265; III. 447 ff., 469, 549 ff., 587-591
- Garum, I. 201, 205, 209, 488
- Gastrorraphy, I. 387
- Genitals, I. 27, 361; II. 47, 61, 269 ff.; III. 391 ff., 425 ff., 453 ff.
- Gilt-head, I. 195, 205, 487
- Glands (in neck), I. 355; II. 141; III. 511; see also bronchocele, goitre, tonsil
- Glan = penis, see penis
- Goat, I. 193, 197, 203, 209, 484; bile of, II. 217; fat of, I. 417, 449

## GENERAL INDEX

Goitre, II. 141, note; III. 374, note *b*  
 Gonorrhœa, I. 451, note  
 Goose, I. 193, 486; fat of, 484  
 Gourd, I. 193, 195, 201, 205, 207, 209  
 Gout, see podagra and I. 463 (app.)  
 Grain, I. 193, 197, 199  
 Grapes, I. 73, 195, 205, 207, 209, 497  
 Gravedo (common cold infection), I. 45, 47, 71, 73, 89, 97, 371-5 and note; II. 239  
 Gripping pains, I. 431  
 Groin, I. 121, 242, 261, 453, 469  
 Gruel (*sorbitio*), I. 197, 201-3, 209, 257, 263-5, 275, 297, 299, 311, 313, 387, 407, 411, 413, 427  
 Gullet, see œsophagus  
 Gums, I. 95, 125; II. 259-61; III. 367-71; bleeding from, I. 391, 395; gum-boils, II. 259  
 Gurnard, I. 195, 487

### H

Habit (of body), I. 51, 89, 97, 157; cachectic, I. 97; healthy, II. 71; full, I. 97; thin, I. 157; well balanced, I. 9, 101 and note  
 Haemoptysis, I. 37, 95, 113, 121, 123, 133, 135, 391-3; III. 533  
 Haemorrhoids, I. 139; II. 285-7; III. 463 ff., see anus  
 Haemorrhoids (a snake), II. 119  
 Haemorrhage, I. 89, 91, 117, 125, 129, 143, 153, 393; II. 277; suppressed, II. 5; by ligatures, cautery, etc., II. 81; nasal, I. 95, 121, 125, 141, 263; see also blood  
 Hair, of head (*crines*), II. 179-185; skin-hair (*pilus*), II. 179; in cysts, III. 323, 375, note; eyelashes (*cilia*), see eye  
 Ham (*poples*), II. 69; III. 583  
 Hand, anatomy of, III. 489, sometimes used to include carpus and wrist joint, III. 575; fracture of bones of, 575; dislocation of, 575, 583, 585; *manus* = surgery, III. 295, 297, note, 437; see also, I. 9; II. 67, 121  
 Hare, I. 193, 209, 211, 485; rennet from, II. 7  
 Head, anatomy of, etc., see skull; headache, I. 63, 75, 91, 139, 141, 145, 151, 179, 271, 341, 355, 363; II. 61, 181; plasters for, II. 35;

cephalhaematoma (hydrocephalus), I. 365, 369; III. 353; shaving of head as treatment, I. 73, 293, 311, 339, 365, 369, 397; II. 61, 181, 199, 207, 229, 235, 243; III. 355; injury to head, I. 129, 163; III. 493 ff.; weak head, I. 69, 363  
 Heart, muscle, I. 357; ventricles of, I. 357 and note *c*; wound of, II. 69, 73  
 Health, I. 3, 5, 25, 45, 47, 49, 85; prophylaxis, I. 43; recovery of, I. 187, 259, 383, 461; bad health, I. 109  
 Heat, I. 39, 45, 51; effect on body, I. 77, 91-3; of sun, I. 323; heating foods, I. 207, 215  
 Heel, anatomy of, III. 491; suppuration of, II. 19  
 Hernia, III. 381 ff., 389 ff., 393 ff.; operation for, 399 ff.  
 Hiccup (*singultus*), I. 125, 139, 341, 413  
 Hilarity (in lunatics), I. 173, 291, 295  
 Hip, anatomy of, III. 489, 600; see also, I. 91, 119, 151, 359, 393; II. 21, 61; dislocation of, III. 587; hip joint disease, I. 453-5  
 Homeopathic remedies, see remedies  
 Honey, used internally, I. 61, 73, 173, 193, 201-11, 257, 273, 387, 389, 411, 427, 445, 447, 496; II. 217; constantly used in external applications, *e.g.* II. 5, 7, 9, 11, 65  
 Hook, see *Medicamenta II, hamus*  
 Hospital practice, I. 35  
 Hot-water bottles (and equivalents), I. 191, 279, 349, 379  
 Humerus, anatomy of, III. 485-7, 598; fractures of, 537; 543 ff.; dislocations of, 569 ff. combined with wound, 585; different meanings of, III. 593, note *b*  
 Humours, I. 9; humour from eyes and ears, I. 37, 71, 73, 95; III. 357; in hernias, III. 377 ff.; removal by cautery and incision, III. 381, 383 ff.; see also, I. 185, 339, 365; II. 31; hyaloid humour, see eye  
 Hydrocele, III. 395, 397, 415  
 Hydrocephalus, I. 365, see head  
 Hydromel, I. 173, 297, 299, 311, 341, 383, 385, 407, 411, 439, 497  
 Hydrophobia, II. 113-5

## GENERAL INDEX

Hymen (membrane), III. 453  
 Hypospathismos, III. 355, note  
 Hysteria, I. 447, note, II. 49, note

### I

Icterus, see jaundice  
 Ignis sacer, II. 53, 59, 135; III. 589, 590  
 Ileus (intestinal disease), I. 91, 119, 139, 149, 427  
 Ilium, I. 19, 363; III. 399, 455  
 Impetigo, II. 169, note c; 171  
 Induration, drugs to soften, II. 21  
 Incision, (1) surgical (*plaga*), I. 383; II. 71, 183; III. 343, 399 ff., 509  
 (2) accidental cut, III. 509  
 Infancy, I. 95; infants, II. 165, 183  
 Inflammation, I. 9, 11, 273; II. 83, 273, III. 399, 407; of intestine, I. 427; of stomach, I. 397 ff.; dispersed by certain foods, I. 213, 215, and drugs, II. 5, 11  
 Inguinal hernia, see hernia  
 Insanity, I. 89, 97, 107, 125, 127, 139, 153, 173, 183, 189, note; treatment of, 289-303  
 Insomnia, I. 95, 103, 129, 197, 309, 409  
 Intestines; caecum, I. 361; colon, I. 75, 171, 355, 361; jejunum, I. 339, 359; rectum, I. 361; disease of intestines, I. 149, 419-447; injury to, II. 69; lubricity, intestinal, I. 137, 147; obstruction of, I. 30, note; pain in, I. 153, 431; surgical treatment of, III. 379 ff.; wound of, III. 385 ff.; intestinal hernia, III. 381 ff., 409; intestinal contents, see defaecation  
 Inunction, I. 43, 49 ff., 55, 69, 177; in colds, I. 373-5; in convalescence, I. 461; in malaria, I. 261, 265, 275, 279 ff., 311, 327; in epilepsy, I. 337 ff.; in paralysis, I. 347-9; in phthisis, I. 327; in spleen disease, I. 415; in stomach trouble, I. 399 ff.  
 Intoxication, I. 49; treatment of, I. 37  
 Iris, see eye  
 Irritation, relief of, II. 11, see *Medicamenta I, malagma*,

### J

Jaundice (*icterus*), described with treatment, I. 339-43, see also, I. 105, 117, 149, 183  
 Jaw, (1) lower or mandible (*maxilla*), anatomy of, III. 479, 594-5; fracture of, 523 ff.; dislocation of, 561, 563;  
 (2) upper (*malae*), III. 479, 595  
 Joints, callus in, I. 137, 147; II. 31; diseases of, I. 89, 91, 97, 119, 127; esp. 455-61, 463-5; injuries to, II. 69-95 and dislocations of, III. 559 ff.; see also, II. 19, 21, 29; emollients for, II. 29, 31  
 Juice, foods of good and bad juice, I. 199 ff. (euchylous and kako-chylous)

### K

Kid, I. 485, see goat  
 Kerion, II. 159 and note  
 Kidney, anatomy of, I. 359, 361; disease of, I. 97, 121-3, 393-5, 419, 449; injury to, I. 395 and note a; II. 69, 73  
 Kidney, animal's, as food, I. 203  
 Knee, anatomy of, II. 491; dislocation of, I. 585; fatigue in, I. 99; pain in, I. 455

### L

Lacrimal fistula, II. 334, note  
 Lamb, I. 195, 197, 203, 484  
 Leech, II. 123  
 Leek, I. 193, 201, 331, 351, 389, 391, 395, 407, 419, 492; local use, II. 5, 7  
 Leg, anatomy of, III. 491, 600, 601; fracture of, 547; dislocation of, 577; varicose veins in, III. 467; see femur, tibia, calf  
 Leientery (intestinal disease), I. 91, note, 129, note, 137, 147, 149, 431, 435, note, 437  
 Lenticula, (1) a surgical instrument. see *Medicamenta II*  
 (2) a hot water bottle, I. 191  
 (3) a spot on the skin, II. 183, 185  
 Lentil, I. 193 ff., 389, 444, 490  
 Leprosy, I. 166 note b, 172, note a; III. 342, note  
 Lesion, I. 157, 159; II. 67, 87, 107, 179; III. 493

## GENERAL INDEX

- Lethargy, for disease and its treatment, I. 309, note; see also, I. 97, 297, 335
- Lettuce, I. 195, 201, 203, 205, 209, 211, 331, 417, 492
- Leuce (a skin disease), II. 173, note
- Ligature, II. 81; III. 401, 405, 465
- Lightning stroke, I. 345
- Limbs, treatment of wounded, II. 95
- Lippitudo, see eye
- Lips, operation on, III. 361, 375
- Lithotomy, III. 425 ff., also I. 360, note
- Liver, anatomy of, I. 357; abscess of, 131, note *a*, 133, 143, 413-5; opened by cautery, 415, note *a*; anodyne for, II. 17; dropsy complicating, I. 119; enlargement of, I. 91, 125; cirrhosis of, I. 149, 323; pain in, II. 61, 63; wound of, II. 69, 73; III. 311; animal liver as food, I. 201, 209; in an eye salve, II. 225
- Lobster, I. 207, 261, 488
- Loins, I. 359
- Lung, anatomy of, I. 355, 357; abscess in, 131, note; disease of, I. 103, 129, 133, 141, 325, note; 409; injury to, II. 69-73; see consumption, pneumonia and phthisis
- Lupus, (1) a fish, bass, I. 487; (2) skin disease, II. 53, 59, 135. III. 590, note
- Luxata, III. 298, note
- M
- Mackerel, I. 195, 487
- Madness, see insanity
- Malagma, (1) poultice, see *Medicamenta II*, s.v. (2) a soft cushion, I. 315
- Malaria, I. 237, note; see also Feve.
- Mandible, see jaw (lower)
- Mania, see insanity
- Marrow, spinal, anatomy of, III. 481; as food, I. 215, 433; topical use I. 449; II. 13, 37
- Massage, masseur, see rubbing
- Matter, diseased (*materia morbi*), I. 30, note, 155, 175, 351
- Maxilla, see jaw (lower)
- Mead, I. 73, 197, 199, 207-11, 417, 429, 497; see mulsum
- Meals and meal times, I. 29, 49, 57, 67
- Measures and weights, see Vol. II Introduction
- Meat, I. 203, 207, 211, 484; II. 137
- Medicamenta, see Vol. II. Introduction; a part of the healing art, I. 7
- Medicine, art of, I. 3-41, 259, 271, 431; II. 3, 189
- Medical practitioner (*Medicus*), I. 3-41, 69, 255-7; II. 67-9; special practice, oculist, II. 197 ff.; surgeons, III. 295-7; hospital practice, I. 35; *Medici antiqui*, I. 11, 27, 37, 61, 85, 155, 169, 175, 187, 231, 269, 281, 291; II. 115, 227; III. 295, 301, 509; *med. nostri saeculi*, I. 27, 31, 37, 75, 87, 171, 175, 381; II. 99, 119, 145, 197, 227, 251; veterinary practice, I. 35; II. 119
- Melancholia, I. 89, 93, 113, 125, 291, 299, note *d*
- Melas (a skin disease), II. 173, note, 175
- Melicerides, II. 25; III. 325
- Membranes of brain, III. 501, 515
- Menstruation, II. 49, 225; see woman
- Mentagra (disease of the chin), II. 181, note
- Methodic (school of medicine), I. ix 19, 31, 33-37
- Milk, as food, I. 197, 201, 385, 389, 485; II. 191; especially in kidney disease, I. 419, and phthisis, 331; with salt as an aperient, 169, 385, 425, 451; as an antidote to poison, II. 123; excites flatulence, I. 205, 207, 425; almost poisonous, 331, note; used externally, I. 459; II. 11, 55, 235; in a gargle, 235; woman's milk, II. 49, 197, 207, 231
- Asses' milk for podagra, I. 455
- Millet, I. 193, 201, 209, 215, 489
- Mind, I. 5, 57, 73, 77, 95, 99, 125, 147, 157, 191, 251, 289, 291, 363
- Missile (extracted), III. 315
- Mouth, I. 57, 61, 89, 95, 149, 263
- Motion (of the bowels), see defaecation
- Mouth, ulcers in, II. 257, 263; III. 591; see also, aphtha, ulceration
- Mucus, see phlegm
- Mullet, I. 195, 201, 205, 487
- Mulsa (*aqua*) = hydromel; mulsum (*vinum*) = honey-wine, I. 497; see Mead

## GENERAL INDEX

Mumps, II. 266, note  
 Murex, I. 205, note, 209, 211, 487  
 Muscle, II. 45; cut across, II. 83, see  
   biceps  
 Mussel, I. 209, 261, 287, 487  
 Must, I. 498; see Wine  
 Mustard (as a food), I. 201, 203, 209,  
   213, 492; plasters, I. 319, 347,  
   367, 379, 391, 407, 423, 425, 435  
 Mutilation, treatment for, III. 361 ff.,  
   and diagram; see also, II. 67  
 Mydriasis, see eye  
 Myrmecion, II. 161, note c, 163

### N

Nails, II. 291; III. 469, 489, 493; for  
 another meaning of *unguis*, see  
 Pterygium  
 Nævus, II. 183  
 Nature, I. 5, 7, 17, 37, 57, 149, 219  
 Nausea, I. 55, 57, 75, 405, 413, 415  
 Navew, I. 193, 201, 492  
 Neck, I. 111, 151, 305; dislocation of,  
   II. 565  
 Nerve: *nervus* = nerve and sinew,  
 which were not differentiated, I.  
 153, note; see also, I. 163, 185,  
 191, 335, 347-351, 377; II. 95;  
 III. 301 ff., 317; emollient for, II.  
 29; *resolutio nervorum* = paralysis,  
 q.v.; *nervus* = spermatic cord,  
 III. 391-3, 403, 409; *nervosus*,  
 applied to diaphragm, coat of  
 stomach, etc., I. 356, 359, 361;  
 III. 391; of muscle tendons, II.  
 99; III. 543, 583  
 Nettles, I. 201, 493  
 Nose, anatomy of, III. 477; disease of,  
 II. 45, 243; injury to, II. 83; III.  
 365, 361, 519, 521; fracture of, III,  
 521; *ozæna*, I. 275; II. 243, note.  
 367; bleeding from, I. 391; see  
 hæmorrhage; nostrils, ulcerations  
 of, II. 243-7; polypus in, II. 245  
 Numbers (of Pythagoras), I. 237 ff.,  
 and note  
 Numbness, I. 151  
 Nurse (wet nurse), II. 165, 257  
 Nutrient enemata, I. 307, note  
 Nutriment, I. 191-215; list of, 483-99  
 Nuts, I. 195, 207, 354, 495; see  
 almonds, walnuts, and *Medica-*  
*menta I*, s.v. *nuces*

### O

Occiput, cupping over, I. 299, 339;  
 II. 203; III. 565; see skull and  
 head  
 Octopus, I. 207, 487  
 Oedema; I. 119; in stomach inflam-  
 mation, I. 399; in liver abscess,  
 413, spleen and intestinal disease,  
 415, 427; in podagra, 457, 459;  
 in scrofula, 141; parotid swelling,  
 II. 267 (mumps); in abscesses,  
 II. 143-9; after wounds, II. 91;  
 of eyes, II. 215; subcutaneous,  
 treated by dry cupping, I. 167;  
 see also, dropsy  
 Oesophagus, I. 355, 359 (*stomachus*)  
 397, note; wound of, II. 69, 75  
 Oil, I. 495, 496; see also, Olive and  
*Medicamenta I*, s.v. Cyprus,  
 myrtus, cicinum, rosa, sesamum  
 Ointment, see *Medicamenta I*, *un-*  
*guenta*  
 Olives, I. 193, 201, 205-11, 495; oil,  
 I. 173, 213, 261, 271, 275, 279,  
 346, 379, 417, 439, 449, 459, 495;  
 twigs used topically, II. 213  
 Omentum, I. 361; II. 377, 379, 387,  
 393, 413  
 Onion, I. 193, 201, 207-11, 307, 309,  
 331, 347, 371, 491; II. 9  
 Ophis, II. 183, note  
 Ophthalmia, II. 185 ff. and note, 217  
   III. 353; xerophthalmia, II. 217;  
 see also eye  
 Opisthotonus (in tetanus), I. 377  
 Orthopnoæ, I. 385  
 Osteoarthritis, I. 463  
 Oyster, I. 193, 205, 207, 209, 259, 261,  
 487  
 Ozaena, see nose

### P

Pain, I. 23, 89, 131, 147, 151, 153, 167,  
 181, 363; III. 579; see also,  
 headache, pleurisy  
 Palm (of the hand), III. 577  
 Palpation (of abdomen), I. 429  
 Pancake, I. 203  
 Panic (grain), I. 489; see millet  
 Panus, II. 25, note, 145; III. 301, 303  
 Papule, II. 171, see also, pustules  
 Paralysis, described with its treatment,  
 I. 345-51; see also, I. 91, 97, 105,

## GENERAL INDEX

- 137, 153, 157, 179; of eye, II. 223; jaw, I. 413; stomach, I. 397, 401-5; tongue, I. 371; arising from injury to spinal cord, II. 75
- Paronychia, II. 289
- Parotid inflammation and swelling, I. 125, 129; II. 19, 25, 31, 267, note
- Paroxysm, see fever
- Pastry, I. 207
- Parsnip, 193, I. 201 ff., 209, 415, 492
- Parsley, see *Medicamenta I, Apium*
- Patella, III. 491, 581, 600
- Pea, I. 193
- Peach, I. 493; II. 231
- Peacock, I. 193, 486
- Pear, I. 205 ff., 443, 494; twigs used topically, II. 213
- Pecten, (1) bone, see pubes  
(2) shell fish, see scallop
- Pediculus, II. 207
- Pelvis, I. 119, 361; III. 393, 401, 431; pelves, of kidney, I. 359, note
- Penis, diseases of, II. 269-79; operations on, III. 421; see also II. 271; III. 447
- Peritonitis, I. 119, 313
- Pestilence, I. 3, 47, 79, 91; treatment of, 263
- Phagedaena, II. 133, note, 277; III. 591
- Phalangium (spider), II. 121
- Phantoms (seen in delirium etc.), I. 125, 131
- Philosophers, *medici* included among, I. 5, see also 9
- Phimosiis, II. 269, note; III. 423
- Phlegm (*mucus, pituita*), gastric, I. 57, 101, 265, 397 ff.; intestinal, I. 431; pulmonary, I. 143; nasopharyngeal, I. 101, 371-5, 389; in mouth, II. 251, 257, 259; rheum from eye, I. 109; II. 63, 184 ff., 209; III. 331, 339, 351 ff.
- Phrenesis, I. 93, 107, note, 289
- Phthiriasis, II. 207
- Phthisis, see consumption
- Phygetron, II. 145, see panus
- Phymata, I. 141; II. 23, 27, 31, 143, 275
- Pickle, in a dressing, II. 113; pickled fish, I. 195, 201, 209, 417
- Pig (wild boar), pork, I. 195, 197, 201, 203, 269, 485; II. 97, 137
- Pigeon, I. 209, 287, 415; II. 7, 227
- Piles, see haemorrhoids
- Pill, see *Medicamenta I, catapotium*
- Pimple (*phlyctæna, phlyzacion*), II. 165, note, 183-5, see also, pustule
- Pityriasis, I. 151; II. 179, note
- Plague, see Pestilence
- Plasters, see *Medicamenta I, emplastra*
- Placenta, II. 65; III. 461
- Pleurisy, (pain in the side), I. 91, 97, 125, 129, 133, 143, 261, 405; prescriptions for, II. 61, 63
- Pneuma (*spiritus*), see breath (1)
- Pneumonia, I. 308, note a, 409-413; see lung
- Podagra (and cheiragra), I. 77, 119, 137, 453-61, 463 ff., for relation to gout, see 463; applications for, II. 17, 31
- Poisoning, treatment for, II. 123; poisoned weapons, III. 323
- Polypus, (1) of nose, II. 243, 245, 365  
(2) mollusc, I. 487
- Pomegranate, see *Medicamenta I, Punicum malum*
- Pores I. II. 391; II. 7, note, 27
- Porridge, I. 197, 203, 445
- Porriigo, an eruption, see Pityriasis
- Pot-herbs, I. 193, 203-9, 690
- Poultice, see *Medicamenta I, malagma*
- Poultry, I. 195, 415, 441, 486
- Praecordia, meanings of, I. 100, note a; chest, I. 23, 273, 409; region over diaphragm, I. 357, 359, 383, 385; upper abdomen below ribs, I. 45, 101, 103, 127-9, 267, 311, 339, 413; II. 21, 73, 75
- Prepuce, II. 269, 421 ff.
- Pregnancy, see woman
- Prescriptions, II. 3-67; signs use Vol. II., Introduction, lxx
- Premonitory symptoms, I. 85, 97-107; of death, I. 109 ff.
- Proptosis (of eye) see eye
- Psoriasis, II. 173, note
- Pterygium, (1) see eye  
(2) on finger, see whitlow
- Pubes, anatomy of, III. 489, 600; see also, I. 101, 123, 361, 363; III. 401, 421
- Pulex (flea) in ear, II. 241
- Pulse, I. 13, 21, 99, 103, 129, 157, 241, 249, 253, 305; pulsation of blood vessels, I. 305; II. 75, Pulse

## GENERAL INDEX

Pulse, food, I. 191, 193, 205, 490  
 Purgatives, purging, see *Medicamenta I, Purgantia*, also, I. 37, 39, 57, 59, 63, 65, 153, 169, 225, 301, 311, 337-9, note *b*, 341, 343; foods that purge, I. 209  
 Pus, I. 133, 135, 351; different varieties of, II. 77-79; also II. 145; III. 299 ff.  
 Pustules, I. 39, 89, 131, 151, 325; II. 163-167, 183; on eye, II. 203  
 Putrefaction, I. 13; II. 99, 103, 105; foods that readily decompose, I. 207  
 Pylorus, I. 359, 425, note

### Q

Quail, I. 486  
 Quill (used for ear and nose treatment), III. 361, 519  
 Quince, I. 205, 211, 213, 261, 305, 389, 415, 445, 494; II. 55, 139, 193  
 Quinsy, I. 89, 91, 127, 159, 381, note, 383

### R

Rabies, see hydrophobia  
 Radius, III. 487, 573, 599; fracture of, 545; dislocation of, 561, 573  
 Ragadia (anal fissures), II. 281; see Anus  
 Raisins, I. 205, 209, 389; Raisin wine (passum), I. 197, 199, 201-7, 211, 498  
 Regimen, in health, I. 43; for a delicate patient, I. 45-51; in malaria, I. 251 ff.  
 Remedies, general, I. 11, 15, 19-21, 37 ff., 155 ff., 213-215; 219 ff.; II. 3-67; homeopathic, I. 417; II. 109, 113, 119, 201; for insanity, I. 291; rustic or popular, I. 339, 383, 387, 407, 417; II. xiii, 117, 143, 161, 225, 251; *secunda* opposed to *contraria*, I. 39; II. ix, 199, note *b*; foreign, usually avoided, II. 87; an exception, II. 33, note *c*  
 Rennet, II. 7, 13  
 Restlessness (*iactatio*), I. 103, 275  
 Rhexis, I. 393  
 Rheum (from eye), see phlegm  
 Rhyas=lacrimal fistula, III. 331; =perineal fistula, III. 433

Ribs, anatomy of, III. 483, 596; fracture of, III. 531; fistula near, I. 145  
 Rice, I. 197, 201, 331, 490; gruel from, I. 411  
 Rigor, I. 77, 91, 275-9  
 Rocking (*gestatio*), I. 175, note, 181, 183, 261, 287, 297, 311, 321; in phthisis, 327; paralysis, 347-9, also III. 307; gout, I. 457; stomach troubles, 399 ff.; pneumonia, 411; intestinal diseases, 425; see exercise  
 Rubbing (massage, *frictio*), I. 43, 53, 155; see esp. I. 175-181; in malaria, I. 269 ff.; insanity, 293 ff.; also, 307, 315, 319, 323; phthisis and wasting diseases, 327 ff.; epilepsy, 337 ff.; jaundice, 341; dropsy, 315, 319; elephantiasis, 343; paralysis, 349; suppuration, 351; spasm, 369; colds, 373-5; tetanus, 379; throat troubles, 387; haemorrhage, 397; pneumonia, 411; spleen disease, 415; intestinal, 425; bladder troubles, 451; joint pains and gout, 453-5, 461; in convalescent treatment, I. 461

### S

Salads, I. 49, 73, 265, 490  
 Saliva, I. 99, 111, 371; II. 171  
 Salt, see *Medicamenta I, sal*  
 Salves (*Collyria*), see *Medicamenta I and II, collyrium*  
 Sanies, II. 77, 113; III. 447, 435  
 Sarcocoele, III. 399, note, 419  
 Sarcophagus stone, I. 459, note  
 Sargus, I. 487  
 Savouries, I. 49  
 Scabies, II. 167, note, 219, note *d*  
 Scabrous eyes, II. 219; scabrous nails, II. 291  
 Scabs, II. 11, 105, 143, 239, 243, 277; medicines, to induce, II. 11  
 Scallop, I. 205, 487  
 Scalp, diseases of, II. 179; scalping operations, III. 353-7  
 Scapula, anatomy of, III. 485, 597; fracture of, III. 531; acromium (point of shoulder), III. 569; back of scapula, I. 135, 139, 151; cauterization under, I. 351

## GENERAL INDEX

- Scar, I. 125; II. 131, 213, 215; III. 303, 329  
 Scrofula, see struma  
 Scrotum, III. 393, note, 414  
 Scorpion, bite of, II. 119  
 Scurf, see porrigo  
 Sea, bathing, I. 323, 341, 347, 367, 389, 403, 451; voyage, see voyage; sea bream (*sparus*), I. 195, 207, 487; spurge, II. 9. 23; urchin (*echinus*), I. 209, 487  
 Seasons, see spring etc., and weather  
 Secundines, see placenta  
 Semen, I. 451, and note; II. 77  
 Sepia, I. 205, 209-11, 487  
 Service fruit, I. 205-11, 443, 445, 495  
 Serpent bite, II. 111, 115, 121  
 Sex, I. 51, 253  
 Sheep, I. 486; II. 9  
 Shell fish, I. 193, 205, 209, 259, 261, 287, 487  
 Shin, see leg  
 Shoulder, see humerus  
 Side, pain in, see pleurisy  
 Siesta, I. 45, 47, 79  
 Sinew, see nerve  
 Sinus, frontal, II. 218, note  
 Skin, of scalp, diseases of, II. 179-183; of face, blemishes on, II. 183; of penis (*tergus*), III. 421, 423; in elephantiasis, I. 343; graze of, II. 107-9; different layers distinguished, II. 127, note; strips of skin (*habenulae*) removed in operations, III. 313, 341, 355; see epidermis  
 Skull, anatomy of, III. 475 ff., 593, 594; injuries to and operations on, III. 499 ff.; fractures of, III. 493-519  
 Sleep, I. 99, 103, 113, 145, 211, 295-7, 309; foods producing, I. 211; pill for, II. 61; drugs for, see *Medicamenta I, anodyna*  
 Snails, I. 193, 201, 205, 209  
 Sneezing, I. 101, 139, 141, 293, 309; 369; II. 53, 83, 243  
 Sole of foot (*planta*), III. 579, 583  
 Solium (hot bath), I. 189, 261, 327, 333; II. 121, 167; III. 443; see bath  
 Sordes, II. 11, note a, 13, 39, 61, 87  
 Spasm, I. 91, 95, 105, 117, 125, 127, 129, 149, 153, 163, 331, note, 333, 339, 447; after fracture, III. 585; head injury, 505, 517; lithotomy, 431, 435, 441, 447; cynic spasm, I. 369; ear disease spasm, III. 361; eye muscle spasm, II. 223; after poisoning, I. 111; wound spasm, II. 91, 97; see also tetanus  
 Spelt, I. 197, 201, 203, 209, 397, 488  
 Spine, anatomy of, III. 481, 596; curvature of, I. 195; fracture of, III. 535; injury to, II. 66, 79; pain in, I. 393  
 Spleen, anatomy of, I. 357; disease of, 149, 323, 417; II. 311; injury to, II. 69, 73, 129; pain in, I. 89; prescriptions for, II. 19, 61; swelling of, I. 91, 125, 139  
 Spleen, animal, as food, I. 203; ox spleen, as remedy, I. 417  
 Splint, III. 529 and note, 541, 547, 585; finger splint (*Surculus*), III. 549; see *Medicamenta II, canalis, ferula*  
 Splinter (*surculus*), II. 107, 109.  
 Spots (on skin), II. 183 ff  
 Spring (season), I. 67, 89, 151, 153; II. 71; III. 333  
 Sputum, I. 114, 131, 321  
 Squid (*oligo*), I. 207, 487  
 Stab, II. 385  
 Staphylooma, see eye  
 Starch, I. 201, and note, 203, 412  
 Steatoma, III. 323  
 Sternum, III. 483, 596  
 Stomach, I. 49, 61, 355, 357 and note c; diseases of, I. 397-405; foods good or bad for, I. 203-5; treatment for trouble of, I. 75; wound of, II. 69, 75; III. 311  
 Stone (in bladder), see calculus  
 Stool, see defæcation  
 Strangury, I. 89, 139; II. 65  
 Straps, III. 321, 497, 539, 543, 547; see *Medicamenta II, habenae lora*  
 Strength (of patient), I. 9, 157, 235  
 Strigil, II. 229, note  
 Surgeon, I. 487  
 Struma (scrofula), I. 79, 95; II. 19, 23, 25, 27, 31, 141, note; see also goitre  
 Styptics (haemostatics), II. 3, 53; see also astringents  
 Sucking (of poisoned wounds), II. 115, 117  
 Suffusion, see eye (cataract)

## GENERAL INDEX

Summer (season), I. 51, 67, 87; III. 333  
 Suppuration, I. 89, note, 121, 125, 127, 133, 143, 153, 351; II. 7; III. 299 ff.; plasters for, II. 35; see also, abscess  
 Surgeon, surgery, I. 7; III. 295, 297  
 Suture, of skull, III. 475, 505-7, 593  
 Suture for wounds, II. 83-5; III. 311, 339, 365, 387, note  
 Swallow, I. 383, 407, 486; II. 9, 227  
 Sweat, I. 37, 47, 53 ff., 99, 105, 107, 113, 185-191, 305, 323; induced, I. 185, 315 ff., 417, 457; perhaps ἰδρῶς = pus, II. 76, note  
 Swelling, see oedema  
 Sycosis, II. 181, note  
 Symptoms (*signa*), I. 85, general, 97-117; of particular diseases, 117-153; good and bad in suppuration, III. 305-7  
 Syringe, see clyster, *Medicamenta II*

### T

Tears, II. 207; *lacrima* = juice of plants; see *Medicamenta I*, *papaver*, etc.  
 Tabloid, II. 15, note  
 Teeth, anatomy of, III. 479-81, 594-5; teething, I. 95; teeth grinding, I. 111, 127; toothache, II. 61, 247-51, 259; surgery of, II. 259; III. 367; extraction of, III. 321, 369; stopping of, III. 369  
 Temperament, I. 9, 85, 101 and notes  
 Temples, I. 109, 163; II. 187; III. 329, 341, 355, 475, 477; temporal muscles, I. 109; III. 509, 525  
 Tendon, see nerve; *ligamentum nuchae*, I. 483; T. of Achilles, III. 583  
 Tenesmos, a mild form of dysentrey, I. 439  
 Tent, see collyrium (2)  
 Testicle, anatomy of diseases of, III. 391 ff., 411 ff.; excision of, 419; inflammation of, II. 279; injury to blood vessels of, 69; cords of, III. 391, note; tunica vaginalis, 391, note  
 Tetanus, I. 91, 159, 377 and note, 381; see also, spasm  
 Tetany (in cholera), I. 421  
 Therioma, II. 133, note a  
 Thrush, see aphtha

Thrush (the bird), I. 195, 486  
 Thymion, II. 131, note  
 Thyroid gland, III. 375, note  
 Throat (*fauces*), I. 91, 121, 127; blood vessels round, I. 355; II. 69; position of, III. 483; communicates with nose, III. 477; treatment for ulcers in, II. 65; see also, I. 381-389 and notes and *s.v.* oesophagus, tonsils  
 Tibia, III. 491, 601; fracture of leg bones, III. 547  
 Toes, III. 585; included under *digiti*, see fingers  
 Tongue, I. 151, 181, 273, 355; abscess in, III. 375; paralysis of, I. 371; tongue tied, III. 373  
 Tonsils, I. 71, 95, 345, 387; II. 251-255; III. 371, note  
 Trachea (*arteria aspera*), I. 73, 355; III. 375  
 Trachoma, see eye  
 Travel, precautions during, I. 79, 81; as a treatment, I. 349, 391  
 Treatment, differs in different countries, I. 17; novel methods of, I. 27-29; general methods of, I. 155 ff., 219 ff.  
 Trepan, I. 77, 139, 149; in paralysis, I. 349  
 Trepan, see *Medicamenta II*, *terebra*  
 Trephine, see *Medicamenta II*, *modiolas*  
 Trotters, as food, I. 197, 203  
 Trygon, I. 487; II. 251  
 Tuberculosis, chronic pulmonary, I. 325  
 Tumours, (1) due to flatulence, I. 103  
 (2) arthritic swelling on joints, I. 147, 463  
 (3) oedema, I. 119  
 (4) various tumours described, II. 275; III. 323 ff., 345, 375 ff.; groin tumour (*bubo*), I. 121; III. 393; scrofulous tumours, see struma; see also, carcinoma, hernia  
 Turnip, I. 193, 201, 493  
 Tympanites, see dropsy

### U

Ureters (*venae*), I. 361  
 Urethra (*iter urinæ*), I. 361; II. 279; III. 425, 427 ff.

## GENERAL INDEX

- Urine, in health, I. 47, 101; II. 425 ff.; measurement of, I. 317; in disease, I. 105, 107, 113, 121, 123, 131, 133, 139, 143, 451; (?) case of diabetes, I. 315; diuretics, list of, I. 317; foods affecting, I. 211; haematuria, I. 393-5, 451; retention of, I. 149; II. 65; III. 425; see also, strangury; drawing off of, III. 425 ff.
- Uterus, anatomy of, I. 361-3; 455 ff.; disease of, I. 449; II. 61, 63; prescriptions for, II. 49; inversion or prolapse of, I. 27; II. 287; operation on, III. 457 ff.; wound of, II. 69, 75; cervix uteri, I. 363
- Uterus, animal as food, I. 201, 205
- Uvula, I. 383; II. 47; III. 373; inflammation of, II. 263
- V
- Vagina, III. 391, note
- Varicose veins, I. 139; III. 359, 391, 467 ff.
- Varix, II. 67, 101, note; III. 397, note, 415-419
- Veal, see calf
- Veins (*venae*) (1) blood-vessels, including arteries, see arteries; (2) jugular veins, I. 355, note; (3) *venae* = ureters, see *s.v.* For varicose veins see varicose and varix
- Venesection, see blood-letting
- Venison, I. 73, 485
- Ventricles (of heart), I. 357 and note c; of kidney, I. 359, note a
- Vertebrae, described, III. 481-3; see also, 596; dislocation of, III. 561, 565, 567
- Viscera, distinguished from intestines, I. 5, 409, 419; position of, I. 15, 23-5, 359
- Vitiligo, II. 173, note, 175
- Voice, remedy for loss of, II. 61, 65; see also, III. 423
- Vomica, abscess cavity or abscess, *q.v.*
- Vomit, I. 59-63, 173; provoked, 57, 67, 73, 77, 79, 263-5, 277-9, 281 ff., 299, 315, 371, 401; spontaneous in stomach and intestinal trouble, I. 413-5, 421; in sea-sickness, I. 55, 401; in children, I. 95; of bile, I. 37, 105, 151; of blood, I. 37, 113, 161, 333, 395; of pus, I. 103, 195; see also, I. 71, 75, 89
- Voyage, sea, I. 55, 79, 323, 329, 391, 401, 425
- W
- Walnuts, I. 205, 495
- Wart, II. 131, 161
- Wasting diseases (*tubes*, *phthisis*), I. 37, 125, 135, 143, 325, note, see also, consumption and tuberculosis
- Water, for drinking, I. 199, 211, 498; mineral waters, I. 499; water drinking as a treatment, I. 77, 175, 265; hot water affusion, I. 281, 291, 377, 415, 425, 449; cold, ditto, I. 303, 311, 337-9, 347, 365-7, 403, 457
- Weather, I. 51, 67; influence on health, I. 87-97
- Whale, I. 193, 485
- Wheat, I. 193, 201, 488-9
- Whey, I. 169, 485
- Whitlow, II. 49, 65, 289, note
- Wine, I. 197, 199, 201, 497; harsh, 209, 211; lees, 215; new, 207; resinated, 209, 211; salted, 209; strong, 207; sweet, 207, 209; thin, 211
- Winter, I. 39, 47, 51, 67, 87, 91, 153
- Woman, abortion, I. 93, 123, 153, 155; II. 49, 65; calculus in, I. 223; III. 439; diseases of, III. 453 ff.; gravid, I. 93, 111, 123, 137, 147, 153-157; II. 65; embryotomy, III. 455; illness, signs of, in, I. 121; see also, II. 61; menstruation, I. 95, 97, 119, 125, 139, 393, 395, 449; II. 49; retention of menses, I. 393, 455; III. 453; symptoms after child-birth, I. 149; pessaries for diseases of, II. 47-9
- Womb, see uterus
- Worms, intestinal, I. 103, 437; maggots in ear, II. 237
- Wound, general treatment of, II. 67-111; stitching of, II. 83; secured by *fibulae*, II. 83; from

## GENERAL INDEX

bites or burns, II. 111-125; from weapons, III. 315-323; flogging, I. 295, 301; by surgical incisions, II. 71; III. 295, 297 ff.; see also, Book VII (surgery) throughout, and for compound fracture, III. 513 ff.

Wrist, no special name for, included under *manus*, III. 487; dislocation of, III. 574, note, 575

### X

Xerophthalmia, see ophthalmia

### Y

Yolk of egg, I. 487; II. 5, 11, 13

### Z

Zygoma, III. 479, 594

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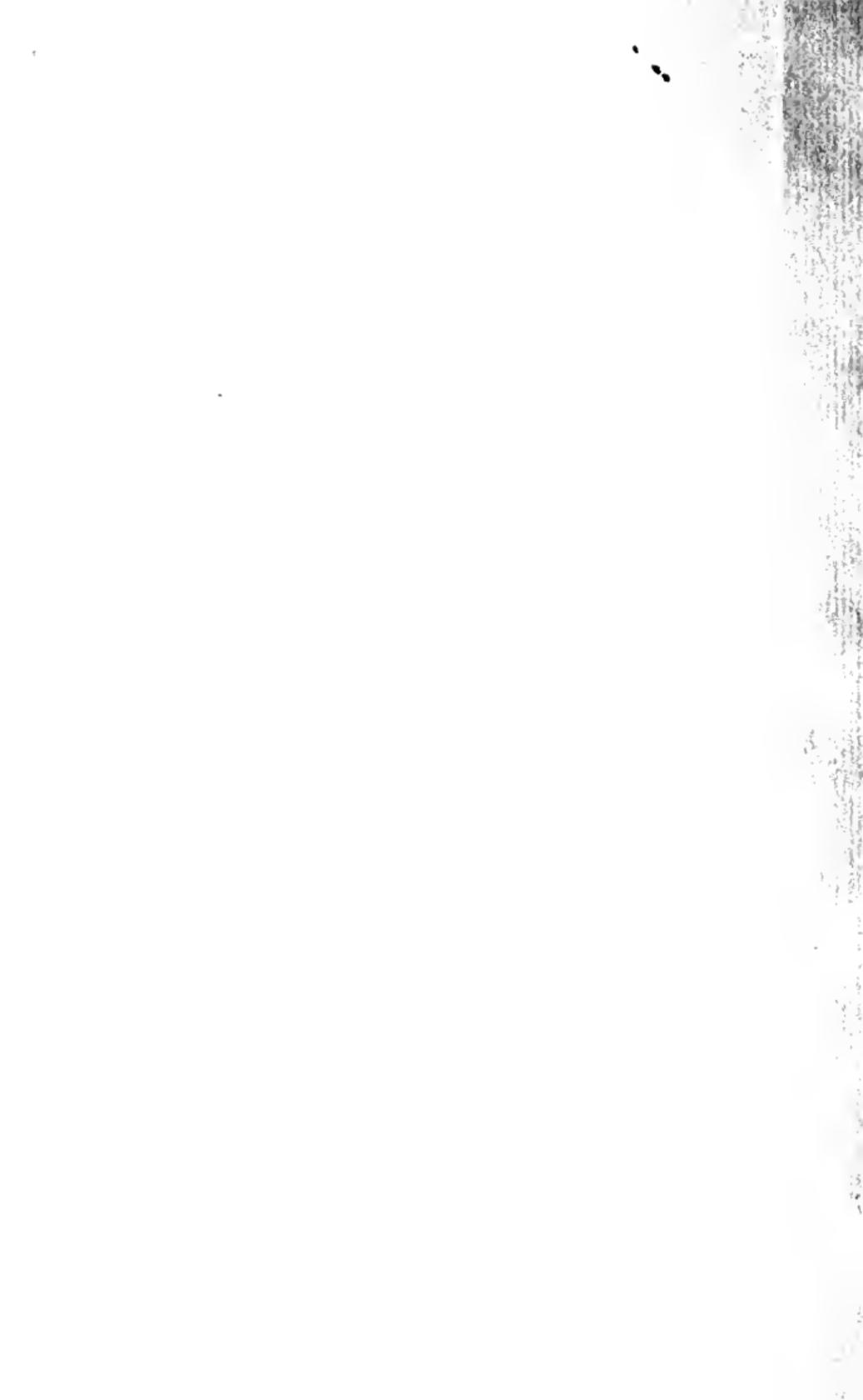
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