
LETTER the FIFTY-FOURTH

Treats of Wounds and Blows of the Belly, Loins, and Arms.

1. **H**AVING treated of wounds of the chest and back, it comes next in order to treat of those that relate to the belly and the loins; and, that no others may remain, we will add those also that belong both to the superior and inferior limbs. First, then, take these observations from Val-salva.

2. A young man, of two-and-twenty years of age, was run at by a cow, and was wounded with her horn about one of his groins. He had a fever; and by degrees his face, and the remaining part of his body, began to swell: yet the tumour could not be class'd with those of the truly œdematous kind. Nothing occur'd besides this, that was worth notice, till the seven-teenth day. And then a difficulty of breathing came on, with a kind of pain, and impediment at the fauces; which, to the patient himself, seem'd to be like a bolus: and he affirm'd, that if he could get rid of this, he should be quite well in every other respect. Yet sometimes, tremors of the whole body were observ'd by those who sat by him; and the tumour thereof, in the mean while, continu'd and encreas'd. At length, about the twenty-second day from receiving the wound, death came on.

The wound being accurately examin'd in the dead body, began near the passage of the spermatic vessels through the muscles of the abdomen, and was continu'd betwixt the musculus rectus, and the tendons of the obliqui, where a quantity of coagulated blood was found. But it did not reach into the cavity of the belly. In this cavity the intestines were much distend-ed with air, and there was a great quantity of stagnant serum.

In the thorax also was a stagnating serum. However, the viscera both of the thorax and belly were very sound. And indeed, the muscles, in several places, preserv'd their natural solidity.

If the tumour, wherewith the body of this young man was distended, had any circumstance attending it, which might make it referable to the class of emphysematous tumours; it might be conceiv'd, from hence, that an emphysema does not arise only from those wounds that penetrate into the cavity of the thorax, or aspera arteria. So even Bartholin, as you have it in this third section of the Sepulchretum (a), when an emphysema had oc-

cupied not only the face but the whole body; could not, nevertheless, find a deep wound, and still less one that injur'd any internal part.

But as to that pain and impediment about the fauces, you remember that I have already made mention of it (*b*), not only from Valsalva, but also from the observations of Wepfer: to which you may add others of Eberhardus Gockelius (*c*), of Elias Camerarius (*d*), and of Maurice Reverhorst (*e*). If you examine all these observations, you will see that this impediment has particularly arisen from wounds: and, indeed, that it has often been the forerunner of convulsions of those parts, near to which this young man had been wounded; and these convulsions you see did come on, in this case also, under the appearance of tremors. And to the same cause was, perhaps, owing, not only the distention of the intestines, but also the effusion of serum into the belly and thorax, by giving a check to the motion of the blood and lymph, in their progress.

4. A man, of forty years of age, was wounded by leaden shot, from a pistol, at the margin of the right os ilium. At first no symptoms appear'd. But some days after a fever came on, with a very great rigor, and recurr'd every four-and-twenty hours: till about the fourteenth day, when he had been short of breath for the space of three days, the patient died; not without some suspicion of the intestines being wounded, for this reason, that a matter had been discharg'd from the wound almost similar to intestinal excrements.

Yet the wound had not penetrated into the cavity of the belly, and the viscera of this cavity were all uninjur'd. The wound itself abounded with leaden shot, which had broken the margin of the bone, that I have mention'd, into small pieces.

5. Although Valsalva has added to this observation, that he had seen another man, who died from a similar wound in the same part, without any other injury which deserv'd attention; and although you are not ignorant, what muscles have their tendons arising therefrom, or terminating therein; yet you will be prevented from supposing this consequence perpetual, by the observation of Meekrenius, which you even read in this section of the Sepulchretum (*f*). For "the spine, or appendix, of the os ilium, being broken into several parts, by a bullet," the man not only liv'd for "twelve weeks," as you have it in the Sepulchretum, "but for fourteen weeks;" and would not, to all appearance, have died even then, if the bullet had not injur'd other parts, and a sudden and violent passion of the mind had not, last of all, come on.

6. A young man, of three-and-twenty years of age, was wounded at the distance of four fingers breadths below the navel. A vomiting follow'd the wound. From the wound came out a portion of the omentum, which, within a few days, was so chang'd in its colour and appearance, as to resemble a firm and compact flesh. In a short time after the infliction of the wound, a diarrhæa came on. In the mean while, the abdomen preserv'd its natural state, if you except the upper part that corresponded to the stomach, which

(*b*) Epist. 15. n. 9.

(*c*) Eph. N. C. Dec. 3. A. 5. Obs. 37.
& 38.

(*d*) Ibid. Obs. 41.

(*e*) Epist. inter Problem. Ruysch. 14.

(*f*) in Additam. Obs. 4. cum Schol.

became slightly tumid. To these symptoms were at length join'd, a difficulty of breathing, and a very frequent cough; together with an expectoration of purulent matter, and a very troublesome pain in the right side of the thorax. And, after being tormented with these symptoms, the patient at length died.

The belly, being open'd, show'd no mark of injury at first sight. But by enquiring farther a purulent matter was soon after found, which stagnated on the right side, betwixt the membranes of the mesentery, and peritonæum, just as if it had been contain'd in a follicle. This matter extended itself from the lower part of the belly, under the liver, quite to the diaphragm.

The corresponding cavity of the thorax also, not only contain'd some of the same kind of pus, but was so fill'd therewith, that no sooner was the knife forc'd into that cavity, in order to cut out the sternum, but the pus rush'd forth with an impetus. In this pus lay the lungs, in a contracted state, and inclining to a black colour. But about the right appendix of the diaphragm, was a pretty thick sanies; so that, at this part, the pus seem'd to have pass'd from the belly into the thorax, as if through a strainer; as so great a quantity of it stagnated about this region, both above and below but no evident passage could be observ'd.

The same quantity of extravasated matter, join'd with a very filthy odour, not only prevented us from enquiring very diligently into this circumstance, but also from enquiring whence so great a quantity of pus had proceeded; whether from a laceration of some of the mesenteric glands, and chyliferous vessels, since no mark of injury could be found in the intestines, or elsewhere.

7. As he who had seen the young man when living, and dissected him after death, I mean Valsalva, supposes that the wound had reach'd to the mesentery, in consequence of the intestines, by their lubricity, eluding the point of the instrument; as must have happen'd, in those who have been run thro' with a sword, and cur'd in a short time, with great success, one of whom I have even seen in this hospital; nothing forbids us to conceive from whence the pus first began to be discharg'd.

But by what way it pass'd from the belly into the thorax, is uncertain. For even in a man who lies in a supine state, and not to say in one who has a great difficulty of breathing, and lies supine for this reason; as the thorax must be sometimes, at least, higher than the belly; it is difficult to conceive, that pus can be carried from the posterior part of the belly, into the thorax, in such a manner as to be collected there in so much more large a quantity, than in the belly.

Nor is it more easy to conceive of it, if you should conjecture that it might be receiv'd into the circulation, and afterwards carried into the thorax: for why should it be carried into the corresponding side of the thorax; and into that part which was nearest to the part that it occupied in the belly; rather than into the other side, or into both, or into any other part of the body? Some things therefore must be suppos'd at a venture. But by this very circumstance it appears plainly, that the case is, as I have said, uncertain.

But in regard to the very great quantity of pus, you may either account for it from the same cause as Valsalva, and from a great quantity of fat in the

the mesentery; or you may suppose that by pus itself, the more pus is form'd, in proportion as it is more acrid, as was shown by that very frequent cough, and in proportion as it affects, or irritates, for a very long time, the parts within which it is contain'd, as it seems in this case to have done.

8. A certain man receiv'd a wound a little after supper, a sharp instrument being forc'd through the epigastrium, a little to the left side, opposite to that rib, which is the third, if you reckon from the inferior parts. He immediately vomited; but what he brought up was quite free from blood: he discharg'd a considerable quantity of blood from the wound. Both of these symptoms return'd on the same night. In the morning the wound was in very violent pain; so that he could not bear the least contorsion of body, without complaining. The day after, at the break of day, he got up out of bed, and what he had in vain attempted before, had an easy and natural stool. But when he went to bed again, he was seiz'd with a kind of sudden swooning, and ceas'd to live; it being now six-and-thirty hours after receiving the wound.

In cutting into the abdomen, the muscles about the wound were found to be every where embrew'd in blood, as it were, for a considerable space; and the cavity of the belly, although the abdomen, when handled, had not been in the least tense, was fill'd with extravasated blood. Under the wound lay the omentum, and the intestinum colon, where it is connected with the stomach. The omentum had a slight injury: the intestine had none at all. But the stomach was perforated with a wound in the middle: and this wound was equal in breadth to the breadth of a filbert. But, although it was enquir'd with great accuracy, whether any other part was hurt besides these, or whether any pretty large vessel was incis'd; nothing was found to be injur'd, besides the parts I have mention'd.

9. Why, although a great quantity of blood had flow'd down into the cavity of the belly; yet no blood appear'd, either by vomiting or stool, any more than if the stomach had not been perforated by the wound, you will learn from the scholium which is subjoin'd to an observation pretty similar to this, that is the twenty-seventh (*g*), in this section of the Sepulchretum; and you will, moreover, learn other causes from the case of Glisson (*b*), which is very improperly omitted in the same place. But to that large effusion of blood into the belly, the sudden death is chiefly to be ascrib'd; especially as it follow'd a swooning.

However, that those persons die within a short time, for the most part, who have no part of the stomach wounded beside the fundus; perhaps even without this effusion of blood; is not only to be argu'd from the nerves, wherewith the fundus is furnish'd, in a great number, and from more than one origin, but is also clearly confirm'd by observations; that which was just now taken notice of from the Sepulchretum, being even set aside, on account of the wound of the thorax, which was adjoin'd to it; as, for instance, by the next to it (*i*), and by others which, besides these, are given by Bohn (*k*), and might be added to the Sepulchretum.

(*g*) § 1.

(*b*) Anat. Hepat. c. 9. in fin.

(*i*) § 2.

(*k*) De Renunc. Vuln. S. 2. c. 4.

And although this author, as well as the son of Etmuller also (*l*), recounts the causes, from which wounds inflicted on the stomach are not mortal sometimes; yet neither of them is silent in respect to the contrary causes: that is to say, those from whence death, for the most part, or frequently a great difficulty of succeeding in the cure, is the consequence.

Turn to three examples, that you have, of the stomach being wounded, two of which are pointed out, from Cowper, in the *Acta Eruditorum Lipsiensia* (*m*), and the third you have in the *Commercium Litterarium Norimbergense* (*n*). But as to the great quantity of blood being effus'd beneath, and yet the abdomen not being tense, you will remember that this has been observ'd by me also, in the case of the taylor (*o*).

10. A young man, of twenty-five years of age, receiv'd two wounds with a sword; the one about four fingers breadth below the xiphoid cartilage, but on the left side, that is to say, about the fourth and fifth rib, reckoning from the lower part upwards; the other a little below the hypochondrium, and on the left side, in like manner. At both wounds the omentum came forth. The wounded young man first went home: but being scarcely able to stand, when he came there, by reason of faintness; he was carried from thence into the hospital of St. Mary de Morte. There, if he attempted to lie down, he felt that a suffocation was coming on, for which reason he was oblig'd to breathe with his neck erect. In the mean while he vomited. He took nothing. At the thirteenth hour after receiving the wounds he died.

The belly and thorax being open'd, in both of them was found extravasated blood, but not in great quantity. The inferior wound had also, in fact, penetrated into the very cavity of the belly; but had touch'd none of the viscera. The superior wound, however, had hurt the viscera, both of the thorax and belly. For the left lobe of the lungs was a little incis'd at its lower and extreme part: but previously to this the sword had pass'd through the diaphragm, leaving a broad wound: and the upper part of the stomach was wounded on both sides; whereby not only the cavity of this viscus was fill'd with blood, but a passage had even been open'd for the stomach itself, through the diaphragm, so that it had pass'd into the cavity of the thorax, together with a portion of the omentum.

11. Of wounds of the stomach we have written just now; and of wounds of the diaphragm we treated in the preceding letter (*p*). And although we have seen a wound of the diaphragm, join'd with wounds either of the heart (*q*), or of the liver and kidney (*r*), in that letter, we have not as yet, however, seen it join'd with a wound of the stomach, as in this case. Indeed, the beginning of those wounds was in the parietes of the thorax; but the beginning of this in the belly: and the position of the diaphragm, which was made mention of in that letter (*s*), was the reason that the wound, proceeding from this beginning, communicated its injury to a viscus of the thorax also; as beginning from the thorax likewise, it communicated its injury to the viscera of the belly.

(*l*) In Programm. cit. ad n. 32. Epist. 36.

(*m*) A. 1699. M. Febr. in Relat. ejus Anat.
ad Tab. 35.

(*n*) A. 1736. Hebd. 16. n. 4.

(*o*) Epist. 53. n. 40.

(*p*) n. 4. & 6.

(*q*) n. 3.

(*r*) n. 41.

(*s*) n. 40.

But as the observation in question has this peculiarity in it, that the wounded stomach ascended through the wound of the diaphragm; it is proper that we speak a few words upon this case, which, though not very rare, is, however, not very frequent, as you well know.

The diaphragm consisting of a nervous, that is a tendinous part, and of a fleshy part, which surrounds the other; and being naturally perforated by more than one foramen; is so interpos'd to the thorax and belly, that it lifts itself up, like an arch, into the cavity of the former, and no where with more declivity than at the posterior part; and this most of all in man: for which reason Pechlinus (*t*) has admonish'd us, that in a wound which is inflicted upon the parietes of the thorax, at a considerable distance from the posterior part; the discharge of extravasated blood, or pus, is not only to be assisted by the inflection of the body to the wound, but by inspiration also; that is to say, that the more the diaphragm, which is then contracted, approaches to the figure of a plane, the less declivity there is to be overcome by the humours, which have flow'd down into that more declining and deeper posterior part of the thorax.

And although the wounds of this very septum are said, by Hippocrates (*u*), to be "mortal;" yet from the words which Hippocrates has made use of, Galen (*x*) has admonish'd us, that those are to be understood which are large and deep, not those that are small and superficially inflicted; not even if they "are in the nervous part of the septum:" for in this very part, he has not said that these slight, but that those large and deep wounds, "do not coalesce." And it is certain that you will see many examples produc'd, of wounds in the fleshy part being cur'd: to which you may, moreover, add three even from Boscus (*y*) alone.

But it is much more difficult to find equal examples of wounds in the nervous part. Yet, in the history remark'd by the father-in-law of Sennertus, the diaphragm being pierc'd through in the nervous part, you will, at least, read this, that after a curative application of two months, the patient "had seem'd to himself to be pretty well," for five months; if you examine Sennertus himself (*z*), instead of the Sepulchretum (*a*), wherein the same history is lamely copied in many particulars. However, wounds even of the fleshy part, not to say of the tendinous part, in the septum transversum, are, for the most part, mortal, and that within a little space of time.

Yet whenever the stomach is carried up through the diaphragm into the thorax, as it even happen'd in the case of Sennertus; it does not always happen through a passage open'd by a wounding instrument. For to omit mentioning the sheep in which Peyerus (*b*) found a transverse opening in the upper and fleshy part of the diaphragm, bigger than the palm of a man's hand; this muscle having been broken through by the very great distension of the stomachs, and one of them having been forc'd up out of the belly within the thorax; there certainly are places in the diaphragm, through which,

(*t*) Hist. Vuln. Thorac. art. 11.

(*u*) Sect 6. Aph. 18.

(*x*) Comment. in cit. Aph.

(*y*) De Facult. Anat. Lect. 4.

(*z*) Medic. Pract. l. 2. P. 2. c. 15.

(*a*) l. 3. S. 8. Obs. 27. § 1.

(*b*) Eph. N. C. Dec. 2. A. 4. Obs. 100.

upon the drawing asunder of the fleshy fibres, and upon the giving way of the membranes, the stomach, or some part of the intestinal tube, or any other viscus, may pass over from the belly into the thorax.

Thus (beside the passage of the œsophagus of which I shall speak afterwards) I see it is related by Platner (*c*), that some part of the colon, but a still larger part of the omentum, and pancreas, was carried up through that passage which transmits one of the intercostal nerves; and this happen'd after very violent pains of the intestines.

Thus also, anteriorly, betwixt the fibres that come from the xiphoid cartilage and the neighbouring fibres, there generally is an interval through which something similar may happen: and I even suspected this to have happen'd in a husbandman, in whom I heard that Leprotti saw, at Rome, part of the intestine colon carried up, through the middle and anterior part of the diaphragm, in so great a quantity as to equal a span, when extended.

But as I afterwards heard, from those who had dissected the body, that neither this intestine, nor the foramen, the diameter of which was two thumbs breadths, and through which this part went out and came in, show'd any sign of foregoing violence or disorder, and that the man died in decrepit age, from a manifest injury within the skull; I chose rather to suppose that it had been thus from the original formation; in the same manner as Chauvet (*d*) suppos'd it to have been in the case of the military officer, in the left cavity of whose thorax, besides the stomach and one half of the spleen, was a part of the intestine likewise that has been mention'd; which, however, did not return by the same foramen that it enter'd, but by another: and the cartilaginous borders of these foramina adher'd closely to the viscera, which pass'd through by themselves.

You will also see, that Riverius (*e*), Bartholin (*f*), and Clauderus (*g*), had the same opinion in regard to two others, if you read the whole passage of Bartholin from the beginning to the end; for the beginning of it is omitted in the Sepulchretum. He and Clauderus speak of one and the same person: but the latter mentions many things of him when living; the former speaks of the body after death. The sum of the observation is, that the stomach, the omentum, a little part of the pancreas, and a pretty large part of the intestinum colon, had lain hid in the left cavity of the thorax: and this part of the colon, together with the duodenum, came out at the same foramen by which it enter'd; this foramen being large in its size, and circumscrib'd by a nervous circle, which was open'd in a peculiar manner in the subjected diaphragm, that was wholly fleshy.

The other young man, describ'd by Riverius, had only the stomach in the thorax, but this on the right side; which part of the thorax, as it was without any lungs, show'd this to have been the state of the parts from the very birth. By what passage the intestine duodenum came out through the septum transversum, Riverius has been silent. These things, however, he has made known, that the young man, during the whole course of his life, had not

(*c*) Disp. de Hydrocel. not. ϕ ad § 2.

(*d*) Hist. de l'Acad. R. des Sc. A. 1729.
Obs. Anat. 2.

(*e*) Sepulchr. Obs. 27. cit. § 2. cum Schol.

(*f*) Ibid. § 3.

(*g*) Obs. 12. in Addit. ad eand. Sect.

been “very much” oppress’d with a difficulty of breathing; for so it ought to have been said in the Sepulchretum also; and that the most violent strainings to vomit, from the taking of antimony, were entirely without effect; the stomach being, as Riverius suppos’d, prevented from discharging itself by the ribs that were around it.

As to the young man of whom Clauderus and Bartholin speak, he had always enjoy’d a free and easy respiration; if you except a sudden and speedily evanescent asthma: and this young man died in the midst of almost infinite vomitings; although the stomach, being connected by some very strong bandages to the diaphragm, and that neighbourhood where it was join’d with the gula, reach’d, with the other part of it that was turn’d upwards, almost to the clavicles; occupying nearly the whole cavity of the thorax wherein it was included.

What symptoms an infant of two months old was troubl’d with, who was in an ill state of health from the very birth, and in whom, after death, Carolus Hultius found almost all the intestines, together with the mesentery, carried up into the thorax, through a foramen form’d by nature in the diaphragm, on the left side of the foramen of the gula, you will learn from the *Acta Eruditorum Lipsiensia* (b).

And I should also suppose that the fissure of the diaphragm, through which the celebrated Stehelinus (i) saw the stomach, the spleen, a part of the liver, of the intestine duodenum, and omentum, carried up into the left cavity of the thorax, in a foetus, was from nature herself; I should suppose so, I say, as the left lobe of the lungs consisted only of one lobule, and was three times less than the right lobe.

I purposely omit what viscera of the belly have been seen in the thorax of other foetuses, which were quite monsters in their formation; as in one of a sow, and in two human foetuses, by a certain anonymous author (k), by Lemery (l), by Vernoyus (m); and that all, in general, saw the diaphragm perforated. For the intention of my discourse requires, that I should return to those bodies in which not the first conformation, but the effects of disease, and particularly wounds, have forc’d the stomach, or any other viscus, into the thorax.

12. The observation of Littre (n) shows that there were, besides a difficult respiration, frequent but ineffectual strainings to vomit, in a dog whose stomach had gone out into the thorax by the same foramen through which the gula enters. And two circumstances show’d this not to have been so naturally; the first, the length of the gula itself, which has not been observ’d by others, I mean, in so great a degree; for when he soon after replac’d the stomach in its natural situation, the gula gave no resistance at all thereto: the second, a large fissure, into which that foramen of the diaphragm had been enlarg’d whereby the same gula is wont to pass, but the intestine duodenum then

(b) A. 1702. M. Decembr.

(i) Tentam Medic. th. 3.

(k) Zodiac. Medic. Gall. A. 4. M. Febr. Obs. 14.

(l) Mem. de l’Acad. R. des Sc. A. 1724.

(m) Comment. Acad. Sc. Imp. Petropol. Tom. 3.

(n) Hist. de l’Acad. R. des Sc. A. 1706. Obs. Anat. 10.

pass'd through; which fissure had already contracted a cicatrix a long time before.

Littre suppos'd the diaphragm to have been thus fissur'd, either from some very violent convulsion of the œsophagus, drawing the stomach upwards, or from a contraction of the diaphragm, and the muscles of the abdomen, at the same time; which contraction the stomach, at that time, perhaps, fill'd with solid aliments, as is often the case in a dog, had assisted.

And I thought it proper not only to take notice to you here of many things from the authors above-mention'd, but particularly of these things from Littre, that, by comparing them together, you may the more easily understand, whether different instruments of vomiting have been wont to be propos'd by different persons with propriety, or not; either when the stomach is in the thorax, and has been plac'd there in the original formation, or has been driven up thither by the force of disease: or, finally, to omit other things in this place which are to be touch'd upon hereafter, that you may conceive by what causes it is driven thither.

For as to its seeming to a very great man, in this our age, that the force wherewith the muscles of the abdomen urge the viscera of the belly upwards in expiration, may be estimated from hence, that they dilate a very small wound inflicted on the septum transversum, to such a degree, as to let the stomach pass up into the thorax this way; you doubtless perceive that, probably forgetting the explication of Littre, he ascrib'd to these muscles alone the whole of that effect, which he ought, unless I am deceiv'd, to have ascrib'd in part to those muscles, and in part to that septum being drawn downwards with great force; especially while, by means of a convulsion, or any endeavour in restraining respiration, it acts in concert with them.

However, if a wound happen to be inflicted in such a manner as to enlarge the foramen through which the œsophagus passes, it is evident that less power is sufficient to produce the same effect. And in this manner the wound had happen'd in a soldier, in whom Glandorpheus (*o*) found that the left part of the stomach had ascended through the same œsophageal passage, together with a portion of the duodenum, and intestinum colon: and this soldier had been carried off by pain, and hæmorrhage, a very great syncope, with an interception of respiration, and a singultus.

And it may even happen, that there is sometimes need of less force; that is to say, in a man in whom this œsophageal passage is of itself pretty wide, as I have told you that it was seen by me in a certain shoemaker (*p*). There is, on the other hand, when a force is requir'd either for a long time, and repeatedly, or in a very powerful degree; whether this same passage, or any other that is not sufficiently open'd by a wound, is to be overcome. It was repeated for eight days, in the case of that man in whom Henricus ab Heer (*q*) saw that the small intestines had crept into the thorax by a "very narrow" wound of the diaphragm; as this patient did not feel the symptoms that shew'd such a state of the parts till the ninth day: and they became fatal within four-and-twenty hours.

(*o*) Sepulchr. S. hac 3. Obs. 21. § 9.

(*q*) Sep. Obs. cit. § 3.

(*p*) Epist. 37. n. 30.

And this force was, perhaps, repeated for five months together, in that student of whom we made mention above (*r*) from Sennertus; for, at the completion of these months, he at length began to be in an unhealthy state: and some days from thence, after frequently-repeated vomitings, and the most fatal symptoms, he died: so that, although there is some proof of not a small part of the stomach having enter'd the left cavity of the thorax several months before, when the wound was inflicted, and having forc'd the heart into the right side, where it was found; for the patient himself "desir'd them" to take notice of the pulsation being there, after the wound was receiv'd;" yet there is some room to believe "that the whole of the stomach," the omentum, and the whole pancreas, had not ascended thither till the latter part of his life.

And there is still more room to believe this in that military officer, in whom, if you look into the Sepulchretum (*s*), you would suppose that Henricus ab Heer, who was spoken of just before, but if you read Parey (*t*), you would know that Guillemæus, had found a great part of the intestine colon driven up into the thorax, through a wound scarcely able to admit a little finger, which pass'd through the flesh of the diaphragm. For although a pain of the intestines us'd to attack him about the evening, yet it was not till the eighth month after receiving the wound, that it increas'd to so severe a degree as to make every remedy ineffectual, and to carry off the patient.

And if it is not the same case, which you will see transfer'd into the Sepulchretum (*u*), from Ballonius; as that pain is not said to have begun till a year after; there seems to have been occasion for a much more long-continued impulse, in order to carry that larger part of the colon through the diaphragm; after the lesser portion had "gradually" enter'd, as Ballonius himself thought. And certainly that celebrated man Fantonus, in the scholium to his father's twenty-third observation; of a young-man, who had been wounded a year before; does not think that the stomach, which had pass'd into the cavity of the thorax, by being thrust through the diaphragm; that was torn asunder where the œsophagus is transmitted through it; came thither before it had been contracted by pains, and vomitings, which took place from the time of inflicting the wound: and that being forc'd, thereby, against the diaphragm, it was, at length, able to tear it asunder; and, by this means, open a sufficient passage for itself.

And he wishes that which I also have wish'd for, every now and then, in many observations of this kind, not even altogether excepting that of Valsalva; I mean that some things had been farther remark'd, in regard to the conditions of the transmitted viscus, or the transmitting septum; and amongst these we place both the situation of the viscus, and of the wound, as in the history of Cloffæus (*x*); which shows, indeed, that the upper part of the intestine colon, which was nearest to the stomach, lay above the diaphragm, to the length of a span: but in what part this muscle was perfo-

(*r*) N. 11.(*s*) Obs. cit. § 4.(*t*) Oper. l. 9. c. 30.(*u*) L. 3. S. 14. Obs. 8. § 8.(*x*) Sepulchr. cit. Obs. 8. § 10.

rated, and in which cavity of the thorax the intestine was receiv'd, we are not at all inform'd.

Yet as he asserts, that the man felt no injury "in the natural or vital faculties," for the whole space of two years after receiving his wound, till being seiz'd with a colic passion, he was carried off from among the living; it would have been natural to suppose, that the intestines, which were found to be "inflated, as if by means of bellows;" making an impetus upon the wound, had then, at length, laid open a passage for that portion of the colon; or, at least, for the greater part of it; if, by saying, that I know not what "had been found to be consolidated," he had not left us doubtful whether he speaks of the colon being somewhat wounded, or of the diaphragm.

But of the long-repeated force enough; now let us add examples of the force being very powerful.

13. It is certain, that in the first of all the observations, of the stomach being forc'd up within the thorax, which was made by Parey (y) upon a stone mason, the power, whereby it was impell'd, was very great. For through the wound of the tendinous part of the diaphragm, which was scarcely equal to a inch in breadth, was it found to be driven, three days after the wound had been inflicted. And Bartholin (z), found not only the stomach there, but also a part of the other viscera, and particularly of the spleen, in an observation which is, in most circumstances, similar to that we have given you from Valsalva.

For, in both of them, the stomach, and lungs, were wounded, together with the diaphragm, and death happen'd on the third day: so that, considering the time, the power appears to have been, without doubt, very great; although we are in neither of them inform'd, what part of the diaphragm was wounded; nor in that of Bartholin whether the wound was narrow or wide; nor, of consequence, how great a resistance there was, in the diaphragm, to be overcome by the impelling viscera.

But in the case of Schoberus (a) we are not wanting in these particulars, which case was so much the more violent, as, without any wound, a very vehement cardialgia came on, in the morning, at break of day; attended with very frequent vomitings, of an incredible quantity of blackish matter, and with strainings to vomit, so that the young man died on the following night: and within his thorax was found, together with the omentum, and intestine duodenum, with the jejunum, and a part of the ileum, the stomach so distended with that matter, and with flatus, as to compress, into a very narrow compass, the heart and the lungs; having been admitted into that cavity, by the same foramen through which the gula is brought down, this foramen "being greatly dilated and depriv'd of its tone."

And if you remember those things that I have hinted at above (b), with Litre, and Fantonus, you will not doubt but this may happen. For when the motion of the fibres of the œsophagus, the stomach, and intestines, is

(y) Sep. 1. 4. S. hac 3. Obs. 21. § 7.

(z) Ibid. Obs. 20. § 2.

(a) Eph. N. C. Cent. 3. & 4. Append. n. 12. c. 1.

(b) n. 12.

inverted, by evident convulsions of the fibres ; it is natural to conceive, that, the stomach ; being carried upwards by the œsophagus, and at the same time (c) the matter being press'd downwards, out of the ascending stomach, by the fleshy fasciculi of the diaphragm, which are not yet very much weaken'd, and which intercept that foramen ; is carried up in an empty state, and those intestines in the same manner : till the force of the inverted motion being continued, and encreas'd, the matter is driven still upwards, and upwards, from the lower parts, so as to overcome the resistance of these fasciculi, and distend the stomach.

And now you have almost all the examples, of the viscera being carried up through the septum transversum into the thorax, which were in my hands at this time of writing ; so that you may compare them with the observation propos'd by Valsalva : I say, almost all. For as to that which I might have quoted from Valentinus (d), of the omentum having fallen through a foramen, formerly made in the diaphragm of a dog, into the thorax ; it is not only a very inconsiderable case, but without any mention of the situation of that foramen, or of the symptoms.

That observation of Beckerus is of more importance, indeed, and mentions the symptoms ; but is quite silent as to the seat of the foramen, as far as I can gather from the *Acta Eruditorum Lipsiensia* (e). This observation is from a child of four years of age, whose stomach, spleen, and liver, were in the left cavity of the thorax, for two years together, as I suppose ; for it had pass'd the first two years of its life in tolerably good health. Nor does the observation of Carolus Piso, *De Morbis a Sero*, “ section the second, part “ the second, and chapter the seventh,” of a very great tumour of one of the kidneys, relate to this subject, as some seem to believe. For if it is that, as I suppose, which is extant in that seventh chapter of Piso, which is quoted, and under number forty-six ; he indeed describes the septum transversum as having been driven upwards by the tumour of the kidney ; but not as having been perforated.

Yet this muscle was perforated, by the erosion of a large cancerous tumour of the pancreas, which had thrust part of itself into the left cavity of the thorax, in the observation of Hertodus, which is transferr'd into the *Sepulchretum* in another place (f). But to lay aside my suspicion, which I have made known to you, in regard to that observation, on a former occasion (g) ; you have, therein, more than sufficient of different causes, whereby to explain whatever had preceded, and the sudden death itself.

At length, when I revis'd this letter, I happen'd to light on that dissertation, which is the sixty-ninth among those chirurgical ones collected by the very excellent Haller ; and as I took notice that some of the examples, I have mention'd here, were wanting therein, so I observ'd, that there were some, which, either on account of my being without the books, or by reason of the language in which they are written, I could not have inspected. You will, therefore, read them in that dissertation, and particularly the case

(c) c. 2. § 18.

(d) Eph. N. C. Dec. 3. A. 2. Obs. 124.

(e) A. 1706. M. April.

(f) l. 3. S. 22. Obs. 40.

(g) Epist. 40. n. 27.

of that girl of Strasburg (*b*), whose symptoms and wound are describ'd: for by this wound she was principally carried off in a few hours; it being in the tendinous part of the diaphragm; and a portion of the spleen and stomach having enter'd the thorax, and forc'd the heart to the right side.

Moreover, I knew that four other examples, to appearance, are read in Blancard (*i*). But if you compare them with those that are produc'd above by me, you will see plainly that they are, in fact, the same with as many of them; although they are chang'd by a transformation which we cannot very easily bear: as, for instance, that student spoken of by Sennertus, into a certain native of Revel (*k*); the son of D. Rat, in Riverius, into a soldier (*l*); the stone-mason, in Parey, into the servant of a certain smith (*m*); and the military officer, spoken of by the same author, into the servant of a certain captain (*n*).

And as these two last changes are plac'd by Blancard in the very beginning of his book, it is not to be wonder'd at, that they have impos'd upon many candid and sincere men, who judge of others by themselves; and, therefore, suppose them to be honest before they find them otherwise, and suspect no such fraud: and, amongst these, it is not surprizing that he should have impos'd upon Bohn (*o*); so that, together with the two observations just now referr'd to in Parey, he has quoted the first and second of Blancard, as if not made out of them.

But from wounds of the abdomen let us go on to other examples of compressions, or concussions, of this part, which we may copy from the papers of Valsalva.

14. A man, of five-and-thirty years of age, was kick'd on the abdomen by a horse; from whence being seiz'd with cruel pains and vomiting, he was receiv'd into the hospital of St. Mary de Vita. And there, his pains continuing, with a sense of great weight in the lower part of the belly, and with a difficulty of breathing, he died.

The carcase, being dissected by Valsalva and Peter Molinelli, although it shew'd no contusion in the muscles of the abdomen which corresponded to the place of the injury; yet, when the belly was open'd, exhibited a very large quantity of extravasated blood, which had already begun to be corrupted. The sanguiferous vessels which pass through the omentum were ruptur'd; and the intestine ileum, which lay beneath the omentum, was quite cut asunder, almost transversely.

In the thorax, the lungs were affected with a very great inflammation: and there was a considerable polypous concretion in the right ventricle of the heart.

15. That the parts which are confin'd in the abdomen should be ruptur'd, without the abdomen itself, which first meets the blow, being at all injur'd, is by no means new or unusual. Thus Tulpius (*p*) twice, thus Fontanus (*q*),

(*b*) § 4.

(*i*) Anat. Pract. Ration.

(*k*) Cent. 2. Obs. 9.

(*l*) Cent. 1. Obs. 70.

(*m*) Ibid. Obs. 2.

(*n*) Ibid. Obs. 1.

(*o*) De Renunc. Vuln. S. 2. c. 4.

(*p*) Sepulchr. S. hac 3. Obs. 29. § 9. vel potius 8.

(*q*) Ibid. § 11.

thus Grassius (*r*), thus Raygerus (*s*), saw the spleen ruptur'd; the three first from a blow of a stick, the last from a fall: to which histories, that are propos'd in the Sepulchretum, you may add others also; as that which is extant in the Commentaries of the Imperial Academy at Petersburg (*t*), and that you meet with in the celebrated Heister (*u*). For both of them show the same viscus to have been ruptur'd, and the same very great effusion of blood from thence into the cavity of the belly; the former from the blow of a man's fist, the latter from the kick of a horse. And that the same thing had happen'd in two others, by a similar kick of a horse, you will learn from the *Commercium Litterarium* (*x*). And Bohn (*y*) had reported the same thing to have been found in as many others, but from the blow of a stick.

Nor are other examples of the same kind wanting from blows of any kind, and among these from a fall, which have been remark'd by Peter Albrechtus (*z*), Gotth. Budæus (*a*), Lucas Schrockius (*b*), Hieronymus Laubius (*c*), and Johannes Storchi (*d*). And if you desire others, besides these, you will read two in Hoffman (*e*); and where you may look for two more, the *Commercium Litterarium* will show you (*f*); and where you may, moreover, find still others, you will learn from Platner (*g*): and you will perceive that it is not without reason the last-mention'd author has said, that by a violent compression of the abdomen, the included "viscera are ruptur'd and lacerated, " in such a manner that, all the blood being effus'd, death is soon the consequence. And it is found by experience, that this happens more frequently in the spleen than in any other viscus."

Nor is this to be wonder'd at, if you attend to the soft structure thereof, and the thinness of the coat wherewith it is invested. But if it become softer by the force of disease, and, by a quantity of slowly-circulated blood, is extended below the fortification of the ribs, it is so much the more easily ruptur'd; and pours out in less time the greater quantity of blood: and consequently brings on a more speedy death. And it even appears that this viscus, being become tumid, and almost "pultaceous," in a certain count (*h*), was of itself ruptur'd, and became the cause of sudden death.

But in the kidneys, in proportion as the structure is more compact, so much more reason is there for being surpriz'd, when we read, in the observation quoted from Laubius, that, by reason of an external compression by a fall from on high, not only "the spleen was contus'd quite to rupture," but also that "a foramen, capable of admitting two fingers," was found "on the " back of the left kidney;" or in Mauchart (*i*), that "a very violent and

(*r*) Ibid. in Addit. Obs. 31.

(*s*) Ibid. Obs. 30.

(*t*) Tom. 1. in Obs. Anat.

(*u*) Instit. Chir. P. 1. l. 1. c. 15. not. ad n. 6.

(*x*) A. 1736. Hebd. 16. n. 4. & A. 1740. Hebd. 21. n. 1.

(*y*) De Renunc. Vuln. S. 2. c. 4.

(*z*) Eph. N. C. Dec. 3. A. 9. Obs. 6.

(*a*) Earund. Cent. 1. & 2. Obs. 108.

(*b*) In Schol. ad eand. Obs.

(*c*) Act. N. C. Tom. 2. Obs. 21.

(*d*) Commerc. Litter. A. 1731. Specim. 36.

(*e*)

(*e*) Medic. Rat. Tom. 3. S. 1. c. 7. § 34.

(*f*) A. 1738. Hebd. 32. n. 1. ad Part. 4. & 5.

(*g*) Instit. Chir. § 717. not *a*.

(*h*) Act. N. C. Tom. 5. Obs. 125.

(*i*) Dissert. de Mydriasi, § 32.

“ forcible impulsion of a round, and not sharp, stick, against the abdomen, without any solution of continuity,” was the cause, “ nevertheless, of the middle of the kidney, which was situated opposite to the part that receiv’d the violence, being burst, and proving fatal.”

And now that I have happen’d to speak of the viscera which serve for the secretion of urine; read, I beg of you, the observation of Theodore Zuinger (*k*), which gives you, with a great degree of accuracy, the symptoms and the dissection of a young man; who, having chanc’d to run violently, in the night, with his hypogastrium against the prominent branch of a tree, had not, indeed, the least mark of external injury therefrom, but unhappily got a rupture of his bladder, which was at that time full of urine.

However, not entirely to omit what happens to the other viscera; Heister, whom I have spoken of above, has produc’d two observations (*l*), besides that I pointed out before: the one of the viscera of the belly, which were found to be greatly contus’d and lacerated by very violent blows of a stick, though the stick was but slender; the other, in which he found the middle part of the liver perfectly ruptur’d by the force that had been applied from without; though, externally, not the least mark of injury was seen.

Platner (*m*) will also give you an example of the liver being ruptur’d, and another you may take from the *Commercium Litterarium* (*n*); from whence (*o*) you will, moreover, have a third, of a man being violently struck by a horse in the region of the liver: so that the lower ribs were broken, and the gibbous part of that viscus was cleft, with a great number of fissures, not very deeply however, as I suppose; since the belly was not fill’d with blood, but with a great deal of bloody lymph: and the patient did not die before the fourth day: so that it recalls to my mind that history of Hippocrates (*p*); “ A boy, who receiv’d a kick from a mule on his belly and liver, died on the fourth day;” although this boy, as you see, was also struck on the stomach, and had very different symptoms: all of which being attended to by that grave interpreter Vallesius (*q*), he judg’d that the boy died from the very acute inflammation of those viscera, and not from the rupture, or the effusion of blood.

And, certainly, if there had been a great effusion of blood, both reason, and the observation of Lanzonus (*r*), show us that death must have come on very speedily. For he who was struck with a fist, violently, upon the liver, and had in his belly “ an extravasation of blood, and a rupture of the vessels in the liver, fell down upon the ground soon after receiving the blow, and expir’d in a miserable manner.”

To this subject, also, would relate the history of a boy of seven years of age (*s*), who had been trampil’d upon; as he lay upon the ground with his face upwards; in such a manner, by horses which drew a chariot, that blood was extravasated from the liver, which was ruptur’d and lacerated on the

(*k*) Eph. N. C. Cent. 7. Obs. 30.

(*l*) Not. cit.

(*m*) Not. cit.

(*n*) A. 1738. Hebd. 32. n. 1. ad Part. 5.

(*o*) A. 1734. Hebd. 35. n. 3.

(*p*) Epid. 1. 5. n. 17.

(*q*) Comment. in hanc hist. quæ ipsi 38.

(*r*) Aët. N. C. Tom. 2. Obs. 6.

(*s*) Commerc. Litter. A. 1740. Heb. 52. n. 3.

right side, into the whole cavity of the belly, though this was externally unhurt; if other causes of the death which immediately follow'd, had not been found, at the same time, both in the thorax and in the neck.

But to come nearer, finally, to the observation of Valsalva, which has describ'd the sanguiferous vessels of the omentum, and the intestine ileum, as being ruptur'd; the same vessels, in a woman who was struck by a soldier, and who died suddenly after the whole belly was fill'd with extravasated blood; the same vessels, I say, were shown to be ruptur'd, in this woman, by the small coagula and grumous concretions of blood which were included within the duplicature of the omentum; as you will read in the Petersburg Commentaries just now referr'd to (*t*); where it is indeed said, "that, in this
" very extraordinary case of injury, this perhaps should be taken into con-
" sideration, that, contrary to the custom of nature, the omentum had grown
" into one substance with the fundus uteri:" yet the observation of Valsalva shows this to have been by no means necessary.

But as to what relates to the intestine which was ruptur'd by the kick of a horse, you may compare with this observation that of Kramerus (*u*) on a carman who died from the same cause, but not at the same time, nor from the same internal injury alone; unless you should suspect that the rupture of the intestine ileum is rather to be attributed to a gangrene of the intestines; as that hiatus, which was observ'd in a young man who died not many days after his master had struck him violently upon his belly with a stick, ought, without doubt, agreeably to the opinion of Helwick (*x*), to be ascrib'd to the sphacelus wherewith the colon and ileum had been affected.

Yet even without these, you have in the Sepulchretum (*y*), not only the intestine jejunum ruptur'd, from very violent tramlings of the feet upon the loins and back of a man, when prostrate; but you have also the ileum and the colon perforated, in more than one place, from a very violent dashing of the abdomen against the trunk of a tree, in another (*z*); although the abdomen was found in both of them.

Do not, however, be surpriz'd that, although the abdomen of a woman, who has been describ'd to you in a former letter (*a*), was struck with a stick, and the most violent symptoms were the consequences of the blow, she nevertheless complain'd of a pain in this part only; and that nothing was found to be injur'd within the abdomen, and still less any thing ruptur'd. For all blows are not inflicted with the same degree of force; nor are the intestines equally liable to rupture in all persons: either from their natural propensity; as Aristotle has asserted (*b*), that stags "have their intestine so thin and weak,
" that although you strike the abdomen but slightly, it may be ruptur'd,
" without any rupture of the skin;" or from repletion.

And, certainly, in both of those whose histories I have just now pointed out from the Sepulchretum, the intestines were then extremely fill'd, and

(*t*) Tom. cit. ibid.

(*u*) Commerc. cit. A. 1740. Hebd. 26. n. 2.

(*x*) Eph. N. C. Dec. 3. A. 9. & 10. Obs.

120.

(*y*) In Addit. ad hanc S. Obs. 25.

(*z*) L. 3. S. 14. Obs. 47.

(*a*) Epist. 49. n. 6.

(*b*) Hist. Animal. l. 6. c. 29. in fin.

distended beyond their usual degree, by too great a quantity of fluid; as you will learn from the reading of the observations, and from the scholium, moreover, which is added to the first. You, therefore, if at any time you know that, besides the violence of the blows upon the abdomen, there was at that time a distension of the intestines, from any cause whatsoever; and very considerable and peculiar symptoms come on; will suspect what might happen inwardly, although you see no mark of injury in the skin: and if you are able to do nothing else, you will at least declare your suspicion to those whom it may concern, and that cautiously and with discretion.

And, indeed, if there has not been that distension, and those symptoms do not immediately come on; do not then be without all fear, lest some latent evil gradually increase, and the symptoms thereof break out universally and unexpectedly. Plancus has, with great propriety, said to M. Tullus (c): “I cannot help being in dread, if there be any thing of a wound under the skin, which may do much mischief before it can be known and cur’d.” Read the observation of Lospichlerus (d), and you will perceive that what I say is true. For you will see what kind of fatal disorder at length arose about the fundus of the stomach, in a man who, many years before, had fallen down with his horse; and who, though he felt a violent “compression of the saddle upon his stomach,” had, nevertheless, totally neglected it.

And Platner (e) has, with great propriety, admonish’d us, that scirrhi frequently arise from blows on the other viscera also; disorders which, as you very well know, begin slowly and increase gradually: although it sometimes happens, from the very beginning, that marks of the injury receiv’d discover themselves, and do not fail to continue quite to the end, although in a mild degree; as happen’d to the young man, whom the illustrious Haller (f) describ’d, that was “kick’d upon the abdomen” by his drunken companions.

16. A boy, of nine years of age, having fallen under a carriage, had the wheel run over his belly, and died in this manner. The pain of his belly, indeed, was not great; yet the pulse was but just perceiv’d: the extremities were very cold: the patient scarcely ever lay still, but turn’d himself alternately from one side to the other, with great anxiety. Finally, an hour or two after the pressure of the wheel had been suffer’d, convulsive motions came on; and he died within a quarter of an hour.

The abdomen, which was very tense, being cut into, a quantity of fluid blood was found to be extravasated into the belly; and the intestines were seen to be turgid with air. The right part of the liver, where it is turn’d towards the ribs, was deeply lacerated, to the extent of three inches of Bologna.

In the thorax, the lungs were found to be every-where unconnected on all sides, and sound; except that, on the back-part, they were slightly inflam’d. The ventricles of the heart contain’d a fluid and frothy blood.

(c) Inter Epist. ad Familiar. l. 6. Epist. 18.

(d) Eph. N. C. Cent. 1, & 2. Obs. 151.

(e) Instit. cit. § 718.

(f) Opusc. Patrol. Obs. 25.

17. In turning over the Sepulchretum, you will find two observations, one of which relates to the wheels of an empty waggon (*g*), and the other to those of a well-loaded chariot (*b*), having pass'd over the belly. And, indeed, the different weight of the compressing body ought to be attended to; and, at the same time, the various resistance of the man that is press'd upon; whether you consider his age, or the part of his belly which is compress'd: and the first of those who are there describ'd, was about thirty years of age; the other somewhat more.

The hypogastrium of the first had been compress'd a little above the pubes; and the hypochondrium of the other. In the former, who died within six-and-thirty hours; and not without convulsive motions; under the skin of the abdomen, and the other integuments thereof, which were found, the intestine ileum was found to be perforated: a circumstance that had happen'd the more easily, because it was distended in consequence of drunkenness. In the other, however, who dragg'd on his life for a considerable time, they found the liver to be in an entire state, under the spurious ribs, which were also entire; and none of those parts that are in the cavity of the belly, was ruptur'd: but only a large abscess was found betwixt the muscles of the abdomen and the peritonæum.

But he was a boy of nine years of age, in whom Valsalva found the liver lacerated; and those three were boys also, in speaking of whom above (*i*), from the celebrated Heister, I have said that some viscus, and in the third the liver itself, was entirely ruptur'd in the middle, from the violence applied to the abdomen externally; although the skin itself was found.

And it was still a boy, who, falling down drunk from the shafts of a waggon, was violently press'd upon by the axle-tree and hind-wheel of the carriage; so that he died ten hours after: and had, besides, contusions of the intestines, here and there, with livid appearances; the pylorus, the liver, the vena portarum, and the right kidney, entirely ruptur'd, through the middle, to the great surprize of Preussius (*k*); who wonder'd how it could have happen'd, that he should live so many hours after having undergone such a number of injuries, and having had so large an extravasation of blood, with which he found the belly to be full: and he also wonder'd that the skin was no-where ruptur'd, not even in the abdomen; unless we should, perhaps, say that it was in consequence of this being soft, and easily extended, by reason of the soft viscera being subjected to it, which would suffer the skin to yield, and remain unhurt; and that those viscera were necessarily fissur'd, because they could not give way, but were forc'd and driven against the posterior parietes of the belly, where it is in great measure bony; and these parietes with great violence against the very hard ground, that lay under them.

And, indeed, the same thing seems to happen to the natural integuments of the body, sometimes, that happens to the clothes we wear, which are frequently unhurt by a blow, when the body is wounded beneath. Thus I

(*g*) Additam. ad hanc S. Obs. 27. cum
Schol.

(*b*) L. 3. S. 17. Obs. 29.

(*i*) N. 15.

(*k*) Eph. N. C. Dec. 3. A. 5, & 6. Obs.
228.

have heard, from a colleague of undoubted credit, that the abdomen of a pregnant woman, which had been gor'd by the horn of an ox, was ruptur'd in such a manner, notwithstanding her clothes were neither perforated nor torn, that the uterus could be seen; and that a hernia remain'd there after the cure, which was accurately attended to by himself. And I myself saw a wound, in another colleague of mine, who, while he liv'd, was the very worthy abbe of this celebrated monastery of St. Justin, upon the posterior part of the left scapular bone, which had been lately brought to a cicatrix, and which had been inflicted fifteen days before, accidentally, by the fall of an angular stone, of two pounds weight, that had neither cut his cap, nor his cowl, nor his under thin linen-cap, wherewith his head was cover'd, nor made any perforation in them; but had wounded the natural integuments of his head, that lay beneath, in such a manner, that a great quantity of blood was immediately discharg'd.

And these things are said of blows or compressions of the belly. But whether to one or the other of these causes, or to both of them, or even to a very violent concussion, is to be attributed what you will see related in the next history, you yourself will judge. It was not only related to me by Valsalva, but left in his papers also.

18. A builder, about six-and-thirty years of age, falling from a high building into the dirt, remain'd in a state of stupor. No external injury appear'd. The abdomen swell'd a little after, and became tense. The pulse was so small as scarcely to be perceivable. He died within twelve hours.

On opening the belly, the cause of this part becoming tumid was found to be extravasated blood. In some of the membranes of that cavity, a blackness from contusion appear'd. Yet from the rupture of what vessel the blood had been discharg'd, it was difficult to find out. It might, however, be suppos'd to have proceeded from a branch of the vena cava, because this vein was entirely depleted.

19. And, indeed, in another man, who had fallen from on high, Jacobus Sylvius saw, formerly, a great quantity of blood pour'd out from the ruptur'd vena cava into the cavity of the belly; as you also have it in the Sepulchretum (*l*). And what was found by Valsalva in the belly of a virgin, who had fallen from a considerable height, I have already told you (*m*). Now let us see what descriptions he has left relative to blows upon the loins, and that neighbourhood.

20. A man, very near forty years of age, was wounded with two musquet-balls, in this manner: The balls enter'd at the right side of the second and third vertebræ lumborum, opening only one foramen for themselves; and they went out at a double foramen, the one being pretty large, the other but small, from the middle of the abdomen, about two fingers breadths above the navel. The wounded man went to a place which was not far distant, where remedies were applied by a surgeon. He, from that time, complain'd of violent pain: he was oblig'd to breathe with his neck erect, and not without considerable difficulty and shortness: he more than once vomited: his

(*l*) Sect. hac 3. Obs. 28. §. 6.

(*m*) Epist. 40. n. 9.

urine he endeavour'd to discharge, but in vain : his pulse became gradually small and weak : at length, continuing to speak, and having his senses in a very perfect state, and having taken in the air sometimes with a gaping mouth, which is the certain forerunner of death, he died on the ninth hour after receiving the wound.

The whole back of the carcase began to be livid some hours after death. The day following, in the morning, not only the lividness had increas'd, but, moreover, the whole head was become disfigur'd, and the right eye had swollen to a very great degree. The lips of the wound inclin'd to putrefaction on both sides.

In the belly an extravasated blood was stagnant. The intestinum ileum was perfectly lacerated in three places ; and the colon, in that part which is connected to the stomach, was wounded in one half of its breadth : and all the intestines were red.

As the wound enter'd the cavity of the belly a little below the right emulgent vein, near to the seat of the ureter, it was doubted whether this part was not lacerated. But as the intolerable stench of the carcase oblig'd us to hasten to a conclusion, the matter could not be sufficiently examin'd. It was also doubted, whether the musquet-balls had not been infected with poison.

21. You might here, among other things, enquire how it could happen, that, as there were only two balls, they had lacerated the intestine ileum in three places ? if you did not take notice, that the convolutions of this intestine are of such a nature, that, one part of it being plac'd before the other, the intestine was twice met with in the passage which one of the balls had taken.

22. A man, of forty years of age, was wounded, by the discharge of unequal fragments of lead from a musquet, in such a manner, and in such a situation of body, that in the left buttock, where these fragments had enter'd, were three foramina ; and in the lumbar region, where they had pass'd out, near the lower rib, were seen two foramina. About the fifth day came on a suppression of urine ; and the patient complain'd, more than once, of a spasmodic pain at the upper margin of the os ileum, to such a degree that the whole body was suddenly shaken : and the part could scarcely suffer the touch of the surgeon's hand externally, by reason of the violence of the pain. The pain was increas'd every day ; and the convulsion, in consequence, became more violent and continual ; especially about the throat and the mouth. Yet he retain'd his senses, nevertheless. At length, he died on the thirteenth day.

The wound being examin'd by dissection, it was very evident that no leaden fragment had penetrated to the internal parts. Yet one of them had pass'd a different way from the others, and had broken into pieces the upper margin of the os ilium, where the tendons of the muscles are connected. However, there was no mark of injury in the belly, if you except a kind of blackness of the intestines, and still more of the omentum, as if from contusion.

But the cerebrum was perfectly sound ; so as not to shew the least traces of any serum.

23. This, I suppose, was that other man whom I have observ'd above (n) to have been seen by Valsalva, and to have died from a comminution of the margin of the os ilium, when I had describ'd one that was carried off by a wound of the same kind; but by little pieces of lead, which were not discharg'd on the posterior part in this manner. And near to that, which I just now copied, comes the observation of Harderus, with which I could wish to have a dissection join'd.

It is extant in the Sepulchretum (o), and speaks of a man being wounded with a musquet-ball "behind the nates;" the ball proceeding towards the superior parts, betwixt the muscles and tendons which belong to the back: and you will see, that, from this wound, at length, a strangury first arose, and soon after a convulsion about the throat and mouth; which, being at length propagated to the limbs, and afterwards to the whole body, soon carried off the patient.

24. After wounds follow blows receiv'd upon the loins, and the spine that lies betwixt them. In regard to which blows take the two following observations of Valsalva.

25. A man, of fifty years of age, happening to be walking in a very stooping posture, was struck, by a piece of wood that fell from a considerable height, in a very violent manner, on the three inferior vertebræ of the loins. He fell down half-dead; and, being brought into the hospital of St. Mary de Vita, died four hours after receiving the blow.

The loins, and, in particular, the common origins of the muscles call'd *longissimi dorsi*, and *sacro-lumbi*, were found to be stuff'd up with coagulated blood, from the contusion. Within the vertebræ, where the blow had been applied, was a small quantity of grumous blood; yet the included marrow was not at all injur'd, to appearance. The viscera were likewise unhurt. In the arteries alone; which in dead bodies are, for the most part, wont to contain little blood, so great a quantity of this fluid was found, and in a coagulated state, that they were entirely fill'd therewith; especially about the præcordia, where it had coagulated in a much greater degree.

26. Another man, of six-and-forty years of age, was struck on the back by a piece of falling wood. From thence the power of moving was entirely lost in the legs; though the power of feeling remain'd. The intestinal excrements were discharg'd involuntarily; the urine, by the help of the catheter alone; and this fluid, about the end of the disease, lost its natural colour, and resembl'd water in which fresh meat had been wash'd. In the part of the loins which had been struck, was scarcely any pain perceiv'd. But in this manner he gradually sunk, and was carried off on the fourteenth day.

The limbs of the carcase were lax externally, and easily moveable. The belly being open'd, the intestines were found to be ting'd, in many places, with a considerable blackness; where they were turn'd towards the parts that had been hurt. For the same blackness likewise was extended through the whole iliac and lumbar region; so that the blood appear'd, in some measure,

(n) N. 5.

(o) In Additam. ad S. hanc 3. Obs. 32.

to be coagulated in the interstices of those parts. The spleen was also livid, to a very extraordinary degree, in one half of it. Finally, the lumbar vertebra, as the symptoms of the disease had previously shown, was found to be broken; some bony fragment being conspicuous from thence.

In the thorax, the lungs were distinguish'd with certain black spots; yet on the back part: and both lobes, but especially the left, and in the inferior part, were somewhat inflam'd. Both ventricles of the heart contain'd a polypous concretion; but the right the largest: for this enter'd into the pulmonary artery. However the blood was fluid in almost every part.

27. If you compare these two histories one with another, you will, without doubt, be surpriz'd that he, whose vertebræ are not said to have been broken, should have died within four hours; and that the other, who is said to have one of his vertebræ, at least, broken, should not die till the fourteenth day. Was it because this vertebra was not only one, but perhaps the lowest of all; and because the others were three in number? But those three also were the lower vertebræ: and you know that the body of the medulla spinalis itself does not reach down to the third vertebra lumborum: and it does not seem that so great a difference can be accounted for, from somewhat more, in number, of the nerves which compose the cauda equina, as it is call'd, receiving a concussion; as none of these, certainly, go to the parts above.

And I shall say the same, if you should choose to ascribe that difference to this circumstance; that within those three vertebræ there was some extravasated blood, no mention of which is made within this one. I confess, indeed, that the different consequences which attend an injury of the vertebræ, or of the spinal marrow itself, at different times, do not, frequently, seem to be capable of being easily explain'd.

I omit those observations, that you have in the Sepulchretum, of Rumerus (*p*), and Fontanus (*q*), on a fall from a high place. For, although the former describes similar symptoms with, and even more considerable than, the second observation of Vallalva, and death on the seventh day; yet it does not appear what, and how many, vertebræ were injur'd; and to how great a degree they were injur'd: and the observation of Fontanus, as it tells us of five vertebræ dorsi being luxated, and does not only not take notice of symptoms of this kind, but shows that the life of the patient was prolong'd to a very considerable time; is liable to the doubts of those who do not acknowledge luxations of the vertebræ, as I shall show hereafter (*r*). Read over again, therefore, the history of Meekrenius in the same place (*s*); in which the musquet-bullet, passing betwixt two vertebræ of the loins, broke these vertebræ, and compress'd the spinal marrow; yet did not bring on those symptoms that I have mention'd, nor death till after twelve weeks: nay, as you have it in the author's own words, not even till after the fourteenth week.

And lest you should say, with Hornius (*t*), that the bullet had stopp'd at the

(*p*) Sect. hac 3. Obs. 29. § 7.

(*q*) Ibid. Obs. 28. § 1.

(*r*) Epist. 56. n. 35.

(*s*) in Additam. Obs. 4. cum Schol.

(*t*) in Schol. modo cit.

external integument of the spinal marrow, so that it could not compress it; add to this the observation of Bohn (*u*), who not only saw the spine, in the loins, perforated with a bullet in a military officer, but also “the left half “ of the funis medullaris perforated at the same time; yet in such a manner, that not even the right half remain’d quite untouch’d:” violent symptoms being the consequence thereof, and life, nevertheless, being carried on to the eighth or ninth day.

But lest you should say, after all this, that the bullet which enter’d betwixt the second and third lumbar vertebræ (and much less that which enter’d between the third and fourth, as in the history of Meekrenius) could not have wounded the body of the medulla itself, but only the cauda equina; set both these histories aside; and rather read the observation of Platerus, which is extant in another part of the Sepulchretum (*x*).

In this observation we have the case of a virgin, in whom a leaden bullet, discharg’d from a musquet, having ruptur’d the spinal marrow, within the eighth or ninth vertebra dorfi, had immediately taken away, from the middle of the body downwards, the power of moving and feeling; and life was, nevertheless, prolong’d to the twentieth day. Nay, consider duly what Cuvilliers relates, in the History of the Royal Academy of Sciences (*y*), of a foldier, in whom the point of a sword, to the length of two inches, had pass’d through the twelfth vertebra of the back, and the included body of the marrow; and not only pass’d through, but adher’d there always, and excited the most severe pains indeed, but brought on no paralysis, as long as the patient liv’d: and he liv’d some months.

Now compare with these observations, that which you have in the Sepulchretum (*z*), of Marcellus Lucius. You will read of a man’s dying within about thirty hours, in whom a musquet-ball, having enter’d on the right side, four inches below the region of the kidneys, pass’d through the middle of the spinal marrow, and came out at the left side. Certainly this bullet had not pass’d through the body of the marrow, but the cauda equina.

How could it happen, then, that death was so much the sooner brought on, than in those, in whom the body of the marrow itself had been pass’d through; and yet, at the same time, so much later than in that first man of Valsalva’s, in whom this very cauda equina had not only not been pass’d through, but seem’d to be quite free from injury? Without doubt it is difficult, as I have said, to explain these differences.

Yet if there be any room for conjectures, which, perhaps, are not entirely to be disapprov’d; there may seem to have been two causes, why this man of Valsalva’s was snatch’d away by so sudden a death. For as he walk’d in a prone posture, when the piece of wood, falling down from on high, struck those three vertebræ; I should suppose that they receiv’d the more violent concussion, in consequence of the stroke being receiv’d less obliquely; the sanguiferous vessels being, by that means, ruptur’d, and discharging more blood than perhaps appear’d in that part, as in a falling and supine man, it might have flow’d into other vertebræ, about the body of the medulla:

(*u*) De Renunc. Vuln. S. 1. prope fin.

(*x*) l. 1. S. 15. Obs. 26.

(*y*) ad A. 1743. in Obs. Anat. 11.

(*z*) Sect. hac 3. Obs. 26. § 2.

nearly in the same manner as is suppos'd to have happen'd, by du Verney (*a*), in certain kinds of apoplexies, as it were, after he had, in one of them, seen blood flow down, not from the cranium, but from the tube of the vertebræ.

For that part being compress'd, "from whence the great number of nerves, which give origin to the branches of the intercostal nerve, arise," he thought "that the motion of the internal parts ceas'd." And I should suppose that it ceas'd so much the more easily, in our case, in proportion as the blood (which is another cause of my conjecture) resisted, by its thickness, the influence of the organs which propell'd it; or by that less than proper fluidity, from which it was found to be so concreted in the arteries, and still more about the præcordia.

28. To the blows of the limbs, at length, belongs the following observation of Valsalva: which not only shows how much regard ought to be paid to injuries of the extremities, but, at the same time, confirms this opinion, that, from a convulsion of the jaws, in cases of wounds, fatal convulsions of the whole body are shown to be at hand.

29. A man, of five-and-thirty years of age, was struck, with a very large stone, upon the extremity of his left foot. The contus'd part had no pain in it, unless in consequence of being touch'd. But from the middle, in particular, of the great toe, where the violent pain was excited by touching, it emitted no purulent matter, nor did by any means separate the lacerated fibres of the tendons. The man was in every respect well, and confess'd it, and went about his usual employments with alacrity. On the sixth day, however, he was suddenly seiz'd with tension and pains, and with a dreadful convulsion about the fauces. After this follow'd a very great convulsive motion in the whole body: and that was follow'd by death on the eighth day.

In dissecting the head, nothing preternatural was found, if you except a little serous matter stagnating in the ventricles of the brain.

30. Now let us subjoin some observations of our own, of wounds, or of blows, in the same parts that are hitherto spoken of; preserving the same order as before.

31. A man being afflicted with vomitings, and having a low and weak pulse, in consequence of a wound being inflicted upon the hypogastrium, at the right side of the linea alba, together with some convulsive motions, but no swooning; he died within the third day, in this hospital, before the latter end of November, in the year 1742.

The abdomen, which was not tumid, being laid open, we found a quantity of extravasated blood in a coagulated state: and the intestine ileum was pierc'd through, where it corresponded to the wound.

32. Although the prudent and cautious physician, in forming a judgment of the fatality of wounds inflicted even upon the small intestines, ought not to neglect those things which Abraham Vater (*b*) has learnedly and prudently written upon this subject; yet we, for the most part, experienc'd that to be too true, which, after Hippocrates (*c*), has been said by Celsus (*d*), "that

(*a*) apud du Hamel Hist. R. Sc. Acad. l. 3. S. 5. c. 2. n. 1.

(*c*) S. 6. Aph. 18.

(*d*) De Medic. l. 5. c. 26. S. 2.

(*b*) Disp. inscr. Vuln. in Intest. Lethalitas.

“ he cannot be sav’d, in whom the jejunum, or any small intestine, has been wounded.” To which our Fabricius ab Aquapendente (*e*), has added the following things: “ I have observ’d persons, thus wounded, to have a very small, and very frequent pulse, and to die on the first or second day; from whence, if you see such pulses, always have a suspicion of the small intestines being wounded.”

As far as it has happen’d to me to observe, in a certain man, in whom a wound, inflicted upon the umbilical region, shew’d the intestine jejunum to have been wounded in its situation; Fabricius has spoken with propriety of the pulses, and justly, also, of the day on which death comes on: although, as I was not allow’d to dissect the body, I could not, for a certainty, determine, whether this was to be ascrib’d to the wound of that intestine alone, or to the wound of the mesentery, and the vessels also; from whence blood had been discharg’d.

Without doubt we must be led by our dissections. And as these show us, for a certainty, what intestines were wounded, so they make us conceive, that the term of life is different in different persons, and that very frequently, from this cause; that is to say, according to the various disposition of bodies, and the different symptoms which are join’d to these diseases. If, in this third section of the Sepulchretum, you read the twenty-fifth observation, which contains most of the examples that relate hereto; you will see, that wounds of the intestinum ileum have brought on death, sometimes within two-and-twenty days (*f*), sometimes within three days (*g*), and at other times within four (*h*): but that wounds of the colon became fatal within as many days (*i*); at one time, and at another within as many hours (*k*): and even that, in a certain person, the intestines, both large and small, being pierc’d with many wounds, these wounds had become fatal on the fifth day (*l*).

Add to these from Hoyerus (*m*); that a wound of the intestine duodenum became fatal on the fourth day; from Bohn (*n*), that a wound of the jejunum was follow’d by death a few hours after; from the same author (*o*), from Uzenbezius (*p*), and from Haller (*q*), that a wound of the ileum was fatal on the eighth day, the fourth day, and the first. To me, however, it had happen’d long before, not to observe a different time of death from that in the man in question, in consequence of a wound in the same intestine, as you will learn from the following history.

33. Another man died convuls’d, in the same hospital, on the day after his having receiv’d a wound, with a knife, about the lower part of the right epiploic region, a little before the end of December, in the year 1726.

As I examin’d, with great accuracy, some parts of this body, and particularly the kidneys, one of which was furnish’d with two ureters, that ran distinctly from each other, and were divided, even at their termination, with-

(*e*) Pentateuch. l. 2. c. 34. in fin.

(*f*) § 9.

(*g*) § 15.

(*h*) § 14.

(*i*) § 13.

(*k*) § 6.

(*l*) § 12.

(*m*) Act. N. C. Tom. 3. Obs. 18.

(*n*) De Renunc. Vuln. S. 2. c. 4.

(*o*) Ibid.

(*p*) Eph. N. C. Cent. 7. Obs. 60.

(*q*) Disp. Anat. collectar. Tom. 7. in fin.

in the bladder; I did not neglect to observe those things which related to the wound. The mesentery was pierc'd through, not far from the termination of the intestinum ileum, but without having any vessel injur'd, in such a manner as to be capable of pouring out a great quantity of blood: nor indeed was there any effusion which deserv'd attention. And even that intestine was wounded.

34. This wound of the intestine prevented me from being so capable of confirming the observations of Frederic Ruysch; though, in this man, there was no effusion of blood to render me doubtful. This author having admonish'd us, in his *Tthesauri anatomici* (r), "that throughout the mesentery
" are a pretty considerable number of visible nerves, the injuries of which
" produce very violent symptoms, and very great pains;" asserted, in his *Adversaria* (s), that he had often seen men die within two or three days, after continual and intolerable pains of the belly; in none of whom he could find any part of moment injur'd by the wound, besides the mesentery itself, after the most accurate examination was made: notwithstanding the authors, who had written upon these things to that time, had not pronounc'd the wounds of the mesentery to be fatal. Somewhat nearer to the observations of Ruysch, comes that which was related to me by a surgeon of undoubted veracity, about the beginning of the year 1724, in the following manner; and that a few days after it had been made by himself.

35. A foreigner who had resided here for a long time, and was therefore known to every one, receiv'd a wound with a sharp, thin, and two-edg'd sword, which penetrated the abdomen obliquely, on the left side, under the ribs themselves. The narrowness and obliquity of the wound were such, that not only nothing could come out of the wound; but they would not even suffer the probe, by any diligence of his surgeon, or by the diligence of Massieri himself, to be introduc'd into the cavity of the belly: and yet that the wound had reach'd into this cavity, was plain from the following symptoms.

From the time of receiving the wound, quite to the fifth day; on which the pulse fail'd, and the patient died; he threw up the ingesta and bile, continually, by vomiting; if you except an interval of five hours, which happen'd no more than once. He was tortur'd with pains of the belly. The intestines never discharg'd any thing, unless stimulated by glysters. And although blood had been taken away at three several times, and although none of this fluid ever appear'd in what was discharg'd after glysters, or by vomiting; yet, last of all, blood issued from the mouth before death, and at the same time from the nostrils.

On opening the abdomen, under the intestines, which were turgid with air, a small quantity of blood was seen to be extravasated; and that in the lower part of the belly. And the wound had reach'd to the intestine colon, about four inches below the spleen; but had injur'd it only superficially; and from thence, without injuring any other intestine, it had reach'd to the mesentery: which, for this reason, was not only found to be wounded, but tumid.

(r) I. Repos. 3. n. 13. not. 1.

(s) Dec. 2. c. 4.

36. Although, besides the mesentery, the external surface of the intestine was here wounded also; yet you will easily perceive, that this was much more similar to the observations of Ruysch, except that life was somewhat more prolong'd, when you observe with Boerhaave (*t*), "that the external surface of the intestines is, in fact, nothing but the mesentery itself."

However, when death happens from a wound in the mesentery, and you cannot account for this circumstance from the incision of any of its pretty large vessels, as in the citizen whom Bohn (*u*) dissected; you may ascribe it, with Ruysch, to the puncture of these nerves, but of those that are pretty large: for if the puncture of the very small ones were fatal likewise; there would, in my opinion, be no instance of a successful cure of a wound that pierc'd through the belly: or, at least, none that was soon brought about, and unattended with the most violent symptoms; yet this has been said by us, as I have said above (*x*); and others also have seen it: among whom is Waldschmied (*y*).

But our case was a wound with a sword: Mauchartus (*z*), however, having seen the belly pierc'd through by a leaden bullet; in consequence of which, the wounded man died nearly within the space of five hours; enquir'd into the cause of so speedy a death, and found, that the bullet, after having gone through the fundus of the stomach, "had pass'd, from thence, "through the mesentery, betwixt the colon and ileum, without injuring "either of them, or without rupturing the mesenteric vessels:" and he observ'd, that it was "very little of the contents of the stomach, which had "gone down into the abdomen; and that there were, in no part whatever, "marks even of an incipient gangrene, or any fatal hæmorrhage:" so that he might have attributed this to speedy death, to the larger nerves of the mesentery being lacerated, if he had not been inform'd, "that no convulsions had come on, previously to death; but that the vomitings had been "frequent." Although the internal convulsions of the viscera, perhaps, escap'd the notice of the by-standers.

Certainly, although you have seen it confirm'd, by observations produc'd above (*a*), by me, and particularly by observations referr'd to, in other authors, that wounds inflicted on the fundus of the stomach, are fatal within a short time, for the most part; yet, that this had kill'd, within so very small a space, a man who was so healthy and robust, neither Mauchartus appears to have believ'd, nor do I imagine others will readily believe. But let us return to what I myself have seen.

37. A miller's servant, of one-and-twenty years of age, healthy, robust, and of a very good habit of body, had the same thing happen to him, which happens frequently to young men that are audacious, and full of threats, of which kind he was; I mean, that he receiv'd a wound which prov'd fatal. This was inflicted upon the left epiploic region, with a butcher's knife: as it was then the first watch of the night, he return'd home by himself. In the morning, being brought into the hospital, he was taken

(*t*) Prælect. ad Instit. § 816.

(*u*) De Renunc. Vuln. S. 2. c. 4.

(*x*) n. 7.

(*y*) Eph. N. C. Cent. 9. Obs. 70.

(*z*) Earund. Cent. 5. Obs. 33.

(*a*) n. 9.

under the care of a physician and surgeon. On that day the fever was considerable. But on the following night he vomited, and always trembled with convulsive startings. And continuing to tremble and start in this manner, he died on the following day, in the morning; about the fortieth hour, after receiving the wound.

The body was made use of on the next day, which was the twenty-first, of January, in the year 1738, and on many of the following days, to carry on the anatomical demonstrations, which we had begun to give in the college.

The transverse and oblique muscles of the abdomen, were perforated, in that region which I have mark'd out, with a wound that would admit almost two fingers: and betwixt them the air had enter'd, so that a beginning emphysema was already, in a manner, brought on. This air had got out of the colon; which was wounded, as I shall say just now; into the cavity of the belly, and had distended it. Nor had the air alone come forth from that intestine, but the excrements also: so that, although a fluid was extravasated in the belly, to the quantity of two pounds; the greatest part of it was made up of excrementitious matter, and very little of it of blood; no considerable vessel having been injur'd.

For the knife, having pierc'd through the abdomen, as I have said, had pass'd on obliquely upwards, and inwards: and first, indeed, had incis'd the corresponding part of that intestine, which I have mention'd, in such a manner, that the anterior and posterior surface of it, and that which is turn'd towards the vertebræ laterally, being cut asunder, gave a passage for the air and excrements to be discharg'd into the belly.

After that, the knife had, without hurting the kidney, or the appendix of the diaphragm, pass'd through the *musculus quadratus lumborum*, and had penetrated, beyond this, into the common beginning of the *sacro-lumbus* and *longissimus dorsi*, in such a manner, that of the tendons, which ascend obliquely from this beginning, to the transverse processes of the lumbar vertebræ, one only was incis'd; and that not entirely; but what you know to be much worse, was cut into only in part. From hence, therefore, perhaps most persons would have deduc'd the principal cause of the man's being carried off by convulsive startings; especially, as the wounded intestine was not red, or livid, in that very part where it was wounded.

The fundus of the stomach, when inspected on the internal surface, shew'd the small vessels to be distended with blood here and there, for some space. However, the liver was large, and very long transversely; so as to be extended almost into the whole hypochondrium on the left side. The spleen was also pretty long, and bigger than it naturally is; and the artery thereof, was not only very small, in proportion to the magnitude of that viscus in particular, but very little tortuous also. For I was less surpris'd at the thinness, as I observ'd the trunk of the great artery to be, in that part, as well as in the thorax, very narrow; and not only in proportion to the body, but also in proportion to the vena cava itself; the foramen of which, in the septum transversum, was the largest of all that I ever remember to have seen.

Upon opening the thorax, I found the lungs every where free and un-

connected;

connected; which, you know, happens but rarely in adult persons: but they were furnish'd with bronchial glands, of a larger size than usual, so that one was almost equal in magnitude to a small nut, when compress'd. In the pericardium was a yellowish water, and that not in very small quantity. The heart was rather large, and therein was blood, which, like the blood in other parts, was black; but there it was, also, in some measure grumous. The great artery, beyond the curvature, shew'd some kind of furrows, as it were, drawn on the internal surface, and in a longitudinal direction.

The other circumstances that I have observ'd in this body, do not relate to the present subject.

38. Although you have had a great number of observations, in this letter, in regard to wounds of the stomach, the intestines, and most of the other viscera which are in the belly, from Valsalva, from me, and from other observers; yet I will refer to others, in several authors, which you may, if you please, insert into the Sepulchretum.

To wounds of the larger intestines, that is, of the colon and the rectum, relate the observations of Harderus (*b*), and Bautzmannus (*c*). In the latter is, at the same time, what relates to the diaphragm being wounded; and in the former, what relates to the receptaculum chyli; if I rightly understand it; but, at least, what relates to the kidney being wounded at the same time: mention of a wound in which part is also made in the preceding letter (*d*). Now we shall add the observation of Laubius (*e*), which is so much the more worthy of attention, because the knife had reach'd through the middle of the spleen quite to the left kidney. And there will be another of the spleen from Bernerus (*f*).

Moreover, besides those examples which are pointed out in the latter end of the preceding letter (*g*), as relating to wounds of the liver, Bohn (*b*) will give you others, which have still more reference to the subject of this letter. And in none of the viscera of the belly are deep wounds more certainly, and more speedily fatal, than in this viscus; not only by reason of the multiplicity of its vessels, but also by reason of its greater thickness, the nearer it approaches to the diaphragm.

Wherefore Homer (*i*) has, with great propriety, said of Eurypilus throwing his lance: *Pervasis hepar subter præcordia: statim autem genua solvit*: and in another place (*k*) of Patroclus: *Percussit ubi mentes fingunt circa prudens cor; cecidit autem*: in which passage, by reason of the word *fingunt*, there is some resemblance to a commentary which we have in the book *De Morbo Sacro* (*l*).

And lest you should here think that I digress to the poet, contrary to the custom of the ancients; see what Galen (*n*) has observ'd in regard to that passage of Homer (*m*), which relates to Ulysses and the Cyclops, *Ubi mentes hepar habent*. "So speedy and violent a death," says he, "follows the wound or the laceration of this vein," that is to say, the cava, where it

(*b*) Eph. N. C. Dec. 3. A. 9, & 10. Obs. 62.

(*c*) Ibid. Obs. 234.

(*d*) N. 40.

(*e*) Eph. N. C. Cent. 10. Obs. 8.

(*f*) Act. N. C. Tom. 2. Obs. 69.

(*g*) N. 41.

(*b*) C. 4. supra ad n. 36. cit.

(*i*) Iliad. l. 11.

(*k*) Iliad. l. 16.

(*l*) N. 18.

(*m*) Odyss. l. 9.

(*n*) De Usu Part. 1. 4. c. 14.

connects the liver, into the substance of which it is fix'd, to the diaphragm, " that when the poet says, the very wise and prudent Ulysses lay in wait for " the huge Cyclops, and contriv'd how to take away his life, he determin'd " not to force his sword into any other part of the body, but that where the " liver is contain'd in the diaphragm: so confident was he, in respect to " this place, that if it was affected with a wound, it would not suffer him to " live even a moment of time."

But Riolanus (*o*) also commends Galen, for producing this testimony of Homer: although, through forgetfulness, he asserts that Ulysses really did what both of them say he intended to do.

And whether from a wound of the gall-bladder, an equally speedy and sudden death is to be expected, has been sufficiently shewn by me in the second of the *Epistolæ Anatomicae* (*p*); as I have consider'd all the examples, which had been produc'd quite to that time, of rupture in this part, and not only from a wound, but from any cause whatsoever. I remember to have read only one or two that have been added since that time; one of which you may examine in the works of the very illustrious Van Swieten (*q*).

You will see, indeed, what symptoms, which were very considerable, succeeded to the wound of the vesicle, and the effusion of the bile into the cavity of the belly, both immediately and after some days; but you will, at the same time, see that death did not come on before the beginning of the seventh day. Yet this did not happen by any means in the other example, which the celebrated Tacconus (*r*) has produc'd; but the woman, in whom was an abscess of the liver, which was grown into one substance with the peritonæum, and had ruptur'd the cyst, recover'd perfectly.

And, indeed, I see that Kaltfchmidt (*t*) agrees with Bohn (*s*) in this opinion, that life may be extended for some length of time without the cystic bile: nay, he even thinks that this bile, when effus'd within the abdomen, does not, of itself, bring on any immediate danger.

On the other hand, there is not the least room for doubt, but, if the other bladder, that is, the urinary reservoir, be so wounded as to discharge its contents within the cavity of the belly, that the most violent and fatal injuries are the consequence thereof; as is likewise the case, when the ureters are wounded. For the urine does not always entirely come out by the external wound, where the bladder is open'd, till it begins to be excreted by the urethra (which it could not be at all in the beginning); as happen'd in the cases observ'd by Ruyfch (*u*), by Bohn (*x*), and by Martinus (*y*).

Sometimes, indeed, the wound is not inflicted in an opposite direction, but on the back-part of the bladder; as in the third history which is produc'd by Bohn (*z*), in which the side of the bladder was perforated; and, in like manner, as in that servant-maid, of whom Alexander Camerarius (*a*) speaks,

(*o*) Anthropogr. l. 1. c. 2.

(*p*) N. 96.

(*q*) Comm. in Boerh. Aph. § 312.

(*r*) De raris quibusd. Hepat. &c. Observ.

(*s*) C. 4. cit.

(*t*) Dissert. de Vuln. Hepat. § 48.

(*u*) Cent. Obs. Anat. Chir. 75.

(*x*) C. 4. cit.

(*y*) Commenc. Litt. A. 1731. Spec. 47.

(*z*) C. 4. cit.

(*a*) Act. N. C. Tom. I. Obs. 160. vers. fin.

in whom a leaden bullet had pass'd through the middle substance of the uterus, and from thence also through the middle of the bladder.

We, therefore, come at length to the uterus, other examples of which being wounded you will meet with, besides this instance; particularly in gravid women, in whom, in proportion as it lies more easily open to wounds, so the wounds are attended with more danger. There is, among the chirurgical disputations collected by Haller, one in particular, I mean the hundred-and-thirty-first, in which (*b*) you will find some observations relating to this subject.

But whatever viscus is wounded, although each has its peculiar marks to judge by, and in particular that which anatomy supplies us with; I mean, the knowledge of its proper seat; we must, nevertheless, be cautious, lest we are at any time deceiv'd by this very circumstance, being unmindful of the varieties which frequently occur; as in case of the uterus being inclin'd to one side; or in case of the intestine colon, in particular, being inflected from that transverse situation, which it is wont to have in the upper part of the belly, more or less downwards: or in the liver, of which, if I have not told you in these letters what I have seen differently in different persons, yet I have in the first of the *Epistolæ Anatomicae* (*c*); as also in the second of the *Adversaria* (*d*), where I have not conceal'd what it behoves us likewise to suspect, in some persons, in regard to the stomach.

But suppose that the several viscera should always keep the same situations; as the diaphragm is higher at the time of expiration, and lower at the time of inspiration, does not the liver, in particular, and the stomach, follow the situation of the diaphragm, and therefore descend more when we inspire very strongly? When we stand upright, when, from fasting, the viscera which support the liver are empty, the fulcrum of the diaphragm is also wanting, which resists its descent; as I have said to you already in a former letter (*e*), in respect to the opinion of more than one, both of the ancient and modern authors: to whom you may moreover add those celebrated men Winslow (*f*), and Van Swieten (*g*), who do not doubt but this is confirm'd by the observation of the celebrated Garengéot on the liver of a man, which was wounded while in this state.

All these things, therefore, and others of the like kind, it is necessary to attend to: and if there be any doubt remaining after that; with the knowledge of the more general situation, join other tokens taken from the action and the office of each viscus, and from the nature of those fluids which they contain.

In the same manner, the blood-vessels discover themselves, when wounded, by their blood being in great quantity, if they are large, and there is no obstacle to its profusion from the cavity of the belly; and by its being in very great quantity, if the vessel is very large; as, for instance, if the aorta or vena cava be wounded: although, in such a case, life ceases before we can have time to distinguish.

(*b*) C. 1. § 15.

(*c*) N. 2. 11. & seqq.

(*d*) Animad. 2.

(*e*) 26. n. 25.

(*f*) *Expos. Anat. tr. du bas Ventr. n. 267. & seq.*

(*g*) *Comm. in § cit.*

You have an observation from Helwich (*b*), of a considerably large artery, that is, of the splenic, being wounded; and of the aorta being perforated (without the intestines, which lie before it, being injur'd) at the very division into the iliacs, from Dillenius (*i*). And you may read examples of the vena cava being wounded, in the Sepulchretum, from Hildanus (*k*), and Paaw (*l*): and thereto you may add an example, from Bohn (*m*), of the internal iliac vein; from which you yourself will perceive what may often be an obstruction, for some space of time, to the blood which is about to flow, not only from the cavity of the belly, as I said a little above, but even from the vein itself which is wounded. To return, however, to my observations which relate to wounds of the belly: as the last of them was that which I took from a young man that was servant to a miller; now take some which relate to blows and compressions of the same part.

39. Another miller, but this an old man, falling down upon a stone, hurt the very side of the right epiploic region. For which reason, and because he then, by means of coughing, expectorated blood, though in a small quantity, he came into the hospital. More than fifteen days being elaps'd, and he in the mean while making scarcely any complaint, and staying there only on account of his poverty and feebleness, as it were, said, upon being ask'd, that he was costive in his bowels.

He had, at first, solutive clysters administer'd to him, which, however, return'd without any effect. After this, he said that he had pains in his belly, and that his abdomen had lately become turgid and tense, like that of a tympanitic person: in the morning, therefore, an ounce of that medicine which is call'd diatartarum, was given him. This, however, had no effect; except that, on the following night, the old man discharg'd a great quantity of blood into his bed, without knowing what he had discharg'd: and, at the same time, he threw up from his stomach what he had taken in by way of supper. Soon after this, he was seiz'd with a deliquium, and soon after that with death, which happen'd on the same night; that is, a little before the end of November, in the year 1743.

The abdomen was not only tumid, at about the space of three days from the time of death, but even at the thirtieth hour from thence; and it was already externally green, moreover. Upon the opening of this cavity, much water was found within; although in the feet there was not the least beginning of an œdematous tumour. This water being exhausted, the remaining parts were left in that state for some hours, by reason of the very filthy odour they exhal'd. And when these hours were elaps'd, the internal surface of the peritonæum, also, was become green.

Then re-examining, with more diligence, those things that had before occur'd to the eyes, I saw the omentum to be universally drawn up to the stomach; this last-mention'd viscus not being at all distended: yet the small intestines were very much distended, particularly the ileum, and that in the last turns thereof; to appearance, from the air which was included therein.

(*b*) Eph. N. C. Dec. 3. A. 9, & 10. Obs. 120. sub A. 1698.

(*i*) Dec. ead. A. 7, & 8. Obs. 166.

(*k*) Sect. hac 3. Obs. 25. § 18.

(*l*) Ibid. § 19.

(*m*) De Renunc. Vuln. Sect. 1.

The extremity of the same ileum, and the beginning of the colon, were of a bright red colour, inclining to brown: whereas the neighbouring cæcum, the appendicula vermiformis, and the remaining part of the colon, were of a natural colour; and the whole left part of this intestine, and the rectum, were very much contracted.

Yet that portion of the abdominal muscles, which had been in proximity with the beginning of the colon, appear'd to be black and livid on the internal surface, as if from contusion. But neither this, nor that part of the intestines, which I said was of a preternatural colour, had any thing hard or tumid in them. We could not examine the internal surface of the intestines, by reason of the very disagreeable and almost intolerable odour. The liver was pallid: the spleen was larger than it naturally is: the glands of the mesentery were not so small as to make it necessary to open the fat in order to bring them into sight.

In both the cavities of the thorax was no very small quantity of reddish water: in the pericardium was more than usual; but it was not in so great a quantity as the former, nor of so red a colour. The left lobe of the lungs was, in some part of it, connected with the pleura; yet both this lobe and the right were found.

Upon opening the cranium, and removing the dura mater; under the pia mater, in some places, were observ'd a few air-bubbles, and that appearance of a kind of jelly also. The vessels which creep through this membrane were most of them distended with blood; but still more those which run on the sides of the septum lucidum: and, indeed, from the substance of the medullary part of the cerebrum, drops of blood were prominent; as we cut into it. And these appearances I attended to so much the more, as I had observ'd a smaller quantity of blood than usual, in the larger vessels of the belly and thorax. There was no water in the ventricles of the cerebrum, and the substance thereof was itself sufficiently firm: but I found the cerebellum to be very lax, and the pineal gland still more so; though these parts, and others, which it is not necessary to mention here, I did not dissect later than on the fourth day after death.

40. This man, indeed, died very late from a blow of the abdomen: but another, in this city, very soon; and, as I suppose, about the year 1670, when Jacob Sandri, whom I have already mention'd to you, as one of my preceptors at Bologna, was here upon his studies. What he related to me, I shall give you in just as many words.

41. A certain man being struck on the navel, by the kick of a horse, fell down dead immediately, like an apoplectic person. When he was dissected, there was no other preternatural appearance but a lividness, and blackness, of the intestines corresponding to the part which had been struck.

42. Upon hearing this relation, when I was a young man, the observation of Hildanus⁽ⁿ⁾ came into my mind, of a young man falling down soon after having the umbilical ligament of the liver cut through, and dying very soon. But afterwards; when I observ'd that neither reason, nor the greater part of authors, ascrib'd great effects to the injuries of this ligament; I set aside that

thought, and happen'd to light on another, to which the observations of Bohn (*o*), and others whom he quotes, and some of Benivenius (*p*) besides, seem'd to lead me: I mean of blows on the abdomen, causing a sudden prostration of strength in those who receiv'd them, and even suddenly killing; by reason, as he supposes, of the very violent concussion and convulsion of the diaphragm, from whence suffocation and asphuxia may be brought on.

However, as the blows, of which he speaks, do not relate to the navel, but to the epigastrium; for this very reason, and some others, I myself withhold my assent: but you are at liberty to think as you please.

43. To violent compressions of the abdomen would relate, in preference to others, that which the carman suffer'd from the wheel of a cart being driven over his belly; from whence the most considerable inconveniences, and the largest aneurism of the great artery, that I have ever seen, proceeded; if I had not describ'd this history to you already in the fortieth letter (*q*).

But in regard to wounds and blows of the loins; whereto belong the observations of those celebrated men, Verdriesius (*r*), and Quelmaltz (*s*); as at present I have none of my own at hand; and as I have more than one of those that relate to wounds, or compressions, of the limbs; I will pass over to these.

44. A rustic man, who had a pretty good habit of body, being at work about wood, fix'd several splinters of it very deep into the palm of his right hand; the wound corresponding, pretty nearly, to that interstice which is betwixt the bones of the metacarpus, that lie under the fore-finger and the middle-finger: nor did he show the wound to any surgeon, or physician, till after he was seiz'd with convulsive motions of that whole limb.

Therefore, on the eighth day, from the time of receiving the wound, he was at length brought into this hospital. Blood was then first taken from his left arm; fresh-drawn oil of almonds was given him; oil of turpentine was applied to the wound; the right limb, and the spine, were anointed with such liniments as are useful against convulsions; and some splinters of wood were extracted from the wound; but all was in vain: and that not only for the reason which I shall give you just now, but also because the effects of a disorder, which was entirely neglected for so long a time, had become very deeply rooted in the habit; and the whole limb was manifestly drawn upwards, by very frequent convulsive motions.

Wherefore, within forty hours, from the time of his being brought thither, he died: and this was at a time when I was demonstrating the structure of the human body to the pupils there, on other bodies; for it was now near the end of November, in the year 1742; I therefore made use of this also. But at present I will, according to my custom, pass over other things; and will take notice only of those that relate to the wound, or to appearances not quite natural.

The hand and the arm were not very tumid. The wound had a narrow orifice; and the shape of it was nearly circular: and so deep was it, that it

(*o*) De Renunc. Vuln. S. 1. & S. 2. c. 3.

(*q*) n. 26.

(*p*) De abdit. & c. morbor. causis, c. 110.
in fin.

(*r*) Act. N. C. Tom. 1. Obs. 86.

(*s*) Dissert. de Pingued. § 17. in fin.

came through that interstice of the bones, which I have spoken of, almost to the back of the hand: the tendinous expansion of the pulmaris, the adducens muscle of the thumb, which lies beneath it, and the interossei, not to say the lumbricalis, being perforated; the tendons of the muscles that bend the second and third joints of those fingers, as well as the nerve which ran, as I saw, on the side of the wound, being moreover certainly injur'd, as you will understand from those things which will be immediately said.

For while we examin'd the wound thoroughly in the dead body; with such freedom as it was impossible for the surgeon to make use of in the living body; we found a fragment of the wood, of the form of a parallelopiped; slender in its shape, but longer than the point of the little finger, in its transverse direction, though not so broad by one half; so deeply buried, and so wedg'd and fix'd in, that it could not be got out without difficulty, nor without doing violence to the tendons of those flexor muscles which I have mention'd.

You see plainly then, that these tendons were much affected by the entrance of that fragment; and that, after it had enter'd, by confining the pus, which was discharg'd from the wound in but small quantity, and almost like ichor, it had render'd it more acrid from stagnation, and, for that reason, more fit to vellicate those tendons, or at least that nerve, while it was slowly and gradually distill'd.

The veins, both internally and externally, were, in several places, distended with black and fluid blood: and this it was easy to observe, as we dissected the thorax, the neck, and the head; and from thence it was very easy to know, that the cephalic vein was wanting in the left arm, not only below but above the elbow, except that, above, a very slight and slender resemblance of it was found, at length, with some difficulty, and by means of a very accurate and attentive dissection.

The head being cut off from the vertebræ, no water flow'd out from the tube thereof: and none of this fluid, in like manner, was in the ventricles of the cerebrum; in which the plexus choroides were, as I saw, of a brown colour mix'd with a great redness: and I saw a great number of sanguiferous vessels here and there, during the dissection of the medullary part of the cerebrum, which had the same appearance. But the cerebrum, and the cerebellum, the medulla and the nerves, were of a proper firmness.

45. While I was describing to you these very violent and fatal convulsions, which succeeded to a deep wound of the hand, they brought to my mind those that came on after a very slight wound of the forefinger; which of themselves, indeed, were not so violent, but seem'd more considerable than they really were, not only on account of those symptoms which they had join'd with them, but by reason of the little animal that gave the wound, from whose bite nothing of this kind was expected.

A noble virgin of Verona, of sixteen years of age, having, like Lesbia, that fellow-citizen of hers in Catullus (*), a sparrow which she fed, and with which she play'd; endeavouring one day to take it from her right shoulder (on which it had happen'd to hop) with her left hand, the mischievous little

(*) Carm. 2. & 3.

animal bit her fore-finger with a very violent stroke of its beak, and wounded it, on the external part, in the very joining of the first and second internode. It was plain, from the appearance of the finger, that some nervous part was wounded, besides the common integuments; for it was immediately bent, and could be no more extended, or mov'd: and for that reason it became less movable soon after, when pus was form'd in the wound, the pain being encreas'd, and the hand also becoming contracted and swollen.

To these symptoms was added a fever of some days. Which fever, however, as well as all the symptoms I have mention'd, together with the swelling of the hand and finger, were remov'd, to all appearance, by a speedy and happy cure. But scarcely had they brought about this cure, when, lo! on the fourteenth day from the time of her finger being wounded, a sudden tremor, which began first in her feet, and soon after in her hands, and was from thence propagated through the whole of her body, seiz'd upon the virgin, and brought with it a dangerous and long syncope: on the going off of which her tremors did not for that reason go off; but being join'd with a groaning, and sometimes with a kind of howling, continu'd many hours: till at length opening her eyes, and relaxing the lower jaw, which was forc'd closely against the upper, she return'd to her senses, being quite ignorant of all that had pass'd.

But after a very short interval, all these symptoms return'd again in the same order, more slightly indeed, and for a shorter time; but were so frequently troubling her, that every day sixteen or twenty attacks were reckon'd up. And now this had been the state of the case for six days, when I was consulted, by letters relating these facts; which letters bore date the last day of August, in the year 1743. I was not very well pleas'd, upon calling to mind the aphorisms of Hippocrates (*t*), that the fever had, in this case, been put to flight by the Peruvian bark; and that the wound had been so soon brought to a cicatrix: as I remember'd that it was the opinion of Celsus (*u*), according to the reading which, as I have shewn in a former work, ought to be retain'd (*x*), “that almost every bite has some virus;” and that Matthias Tilingius (*y*), Jo. Georg. Sommerus (*z*), and, before these, John Schenck (*a*), had been of the same opinion, on account of the very violent symptoms which succeeded the bite of a goose, and of a cock likewise: the latter of these authors from the observations of Baccius, the former from their own.

However, as we observ'd that all these bites had been applied to the hands or to the fingers, (as in the case in question) parts which, either because they are furnish'd with so many tendons, or from any other more just cause, are certainly often liable to considerable and violent disorders, even without any virulent infection, when lacerated and contus'd; I gave such an answer to the letter, as, whether the paroxysms had taken their origin from the too hasty occlusion of the wound; or, on occasion of the wound itself, had had

(*t*) S. II. 26. & IV. 57.

(*u*) De Medic. l. 5. c. 27.

(*x*) In Cels. Epist. 1.

(*y*) Eph. N. C. Dec. 2. A. 2. Obs. 75.

(*z*) Dec. ead. A. 10. Obs. 82.

(*a*) Obs. Medic. l. 7. S. 1. Obs. 13. in fin.

the same origin as in hysterical persons (for the virgin was of a sanguineous temperament, inclining to melancholy, and full of juices, and yet did not discharge a sufficient quantity of blood every month from the uterus, in proportion to the quantity of her humours); I say, I gave such an answer as recommended what seem'd to me the most proper methods to be taken. But whether by the help of these methods, or by the strength of nature, and increasing age, all these symptoms were carried off; it is at least certain, that I heard no more complaint of these disorders afterwards.

46. A wool-comber quarrell'd with another wool comber, who was, I believe, his uncle, either by the father's or the mother's side; but certainly a relation. Both of them were heated with wine, which they had drank in great plenty, as most of the common-people are wont to do here on the eleventh of November; for that was the day, in the year 1745. In the night-time, at length, they went from words to blows. The first happen'd to fall down, being lame of his right side. The other wounded his thigh, as he lay, with a knife, and even pierc'd it through. For the point of the knife, entering a little above the knee, on the anterior and internal side, had come out again on the posterior and external side. A great effusion of blood was instantly made from the wound at both orifices; and this hæmorrhage, as it was an unseasonable time of night, not only could not be restrain'd by those who were about him, but could not even be prevented from carrying off the man, when brought into the hospital, within six or seven hours.

The body being lean, but within the bounds of health, was proper for the prosecution of our anatomical studies: and the time of the year was not unsuitable. Wherefore, on the twelfth and on the following days, we dissected it with accuracy. But some things that I observ'd I have refer'd to other writings; and the cause of the lameness itself, which I plainly saw, to another letter (b).

We will now add what remains. And, first, upon opening the wound carefully, the cause of so great an effusion of blood came into sight. For we found that the crural artery, where it goes to the ham, and the attendant vein, were, in great measure, cut transversely.

In the belly, moreover, the omentum, which was moderately fat, was drawn up to the stomach, both on the left and right side. The stomach was full of wine; yet no chyliiferous vessel was found creeping any-where through the mesentery or intestines. The small intestines, except the duodenum alone, were of a brown colour inclining to cineritious: that part of the colon which passes transversely, in the whole of it, and a portion of the parts that lay nearest to it on both sides, were contracted almost to the size of a man's thumb.

The gall-bladder was also contracted; and this appear'd, not only from the small quantity of bile which was in it, but also from the cavity which was hollow'd out in the liver to receive it: for though this should have corresponded to the vesicle in latitude, it was much wider than the vesicle. The kidneys were pretty large; the spleen was small, and of an unusual kind of

figure, yet not less found than the kidneys; except that, while I cut into it, it seem'd to me to be somewhat more firm than it ought to be.

In the thorax, the lungs, which were in other respects found, had so collaps'd into themselves, that I scarcely remember to have seen any that were less extensive in their bulk: but the right lobe was most collaps'd, as it was connected only, at its upper part, by a lax, and not very broad, membrane, to the pleura; whereas the side of the left lobe was, in great measure, very closely connected to the pleura. That they had thus collaps'd, and yet were, if you except the posterior surface, as in propriety we ought, of a cineritious colour inclining to white, was owing to the very small quantity of blood which we observ'd to remain in the larger vessels, both of the belly and thorax; for the muscles were, in other respects, of a very beautiful colour. And even the heart was quite depriv'd of blood; so that in the right auricle was nothing more than a very small coagulum. This inclin'd to the nature of a polypous concretion; whereas all the blood which was contain'd in the several other parts of the body, was fluid.

47. If a skillful surgeon could have been at hand immediately upon the infliction of the wound, by applying the tourniquet, and constringing the femur, above the wound, he would, at least, have preserv'd the patient so long, as to give time to consider of amputating the limb. For the transverse incision both of the artery and of the vein, in great measure, would have render'd ineffectual the other methods of cure, which are not only prudently propos'd by the celebrated Heister (*c*), but also have been successfully put in practice, when this artery was wounded almost in the same place, though in a longitudinal direction.

Nor could an incision of this kind, join'd with so great a fluidity of blood, afford us even the miserable hope that the grunous blood (as you will find, from the Sepulchretum (*d*), that Bartholin had seen in a case, of this kind) should stop up the wound for some days by its coagulum.

However, in regard to the cure of wounds of the vessels, in whichsoever limb they may happen; when they admit of other cures, or when they admit only of amputation; read the many observations produc'd by John Bohn, in his book *De Renunciatione Vulnerum Lethalium* (*e*): and you will not wonder that this very great man is so often commended by me in these letters, when you observe either the number of the examples that he has given, or the perpetual silence that there is in the Sepulchretum in respect thereto; or, finally, when you know what I owe to his memory, who, besides other acts of friendship, when he was an old man, sent this book to me with great kindness, together with his other books, at the time I was but a young man.

48. To violent compressions of the lower limb seems to relate the case of a certain young man, who died in the hospital of St. Mary de Morte, and was dissected when I happen'd to be at Bologna, in the beginning of the month of June, in the year 1709.

49. A young man, of two-and-twenty years of age, having the wheel of a cart pass over almost the lower part of the left heel, seem'd to have receiv'd

(*c*) Dissert. de Arter. Crural. Vulner. n. 6.
& seqq.

(*d*) Sect. hac 3. Obs. 26. § 3.
(*e*) Sect. 1.

no other disadvantage from it but this, that the common integuments were torn away. While the cure of an injury which appear'd slight went on very well, behold! after some days, the neck and the back become rigid; so that, as if he had been seiz'd with a kind of tetanos, he could move his limbs indeed, but could not move either his neck or his back. To this was added, that, at intervals, he was shaken by the most violent tremors of the whole body. And all these symptoms going on, in this manner, for twenty days or more, his senses being always perfect, he having thrown up a round worm by vomiting, and the stertor being much increas'd, he died.

The foot being examin'd about the evening of that very day on which he died, the heel was found to be almost heal'd.

The abdomen, which was turgid, being open'd, a small quantity of water was seen to be extravasated therein; all the intestines, and the stomach itself, being found, but distended with air, to a very great degree. Within the colon, near to the appendicula vermiformis, was a round worm dead.

The thorax also had a small quantity of water effus'd in its left cavity: the lungs of that side were hard posteriorly, and of a substance like that of the liver. There were polypous concretions in the large vessels, and in the ventricles of the heart; in the right of which cavities there was blood also, together with airy bubbles.

Upon opening the cranium, in the right lateral sinus of the dura mater was coagulated blood; in the other was seen a fluid blood, not without some pretty large bubbles. There were many bubbles also under the pia mater, especially about the left anterior lobe of the cerebrum. Under the same membrane was water besides; the taste of which water seem'd, to one who was willing to taste of it, to be nothing at all, or at least nothing more than a slight saltiness. In the ventricles of the brain was a pretty large quantity of water. And no small quantity was discharg'd from the tube of the vertebræ, especially when I order'd the loins and the os sacrum to be rais'd up. The cerebellum was lax, the cerebrum was firm: and the sanguiferous vessels, that crept through the ventricles of the cerebrum, and the plexus choroides, were not at all of a white colour.

50. What Vallesius (*f*) thought of that young man of Hippocrates, who had run through a rough way, and who had, from thence, “a pain in his heel, especially at the lower part;” which part, and the neighbouring parts about it, becoming black, “he liv'd in all but twenty days after having run thus;” and what, in like manner, Augenius (*g*) thought, when he was speaking of many persons who had perish'd from slight wounds, and particularly of M. Sobrirantius, “who, contrary to the expectation of all, died on the fourteenth day after a very small wound was inflicted on his heel;” I mean, that from slight external causes of this kind arises no more than the occasion of the disease; but from the bad habit of body, and from the malignity of the juices, arise the violent symptoms, and even death itself; will certainly seem to you reasonable to be determin'd in this case: and this so much the more, as the worms, and the very quick extrication of

(*f*) Comment. in l. 5. Epidem. n. 47.

(*g*) Tom. 1. l. 9. Epist. Medic. 2. vel potius 3.

the air-bubbles from the blood and humours, may be consider'd as marks of the deprav'd disposition of those humours, or, as the ancients spoke of it, the putrefaction thereof.

Indeed, I do not despise tokens of this kind taken from Hippocrates himself (*b*), where he has said, "that men die from wounds of every kind, and such as are in no respect considerable; nor need we be surpriz'd at this - - - , when we consider that - - - the bodies of men differ so much from each other." And, besides, you know that I am not ignorant of this saying of Valerius, as I have spoken of it to you on a former occasion (*i*): "the end of our life being expos'd to various and occult causes, they sometimes, undeservedly, bear the reproach of being fatal; whereas they happen rather at the time of our death, than are themselves the causes of it." Finally, in this very letter (*k*), when I related the case of that virgin of Verona, which was follow'd by violent symptoms, you might see how much I ascribe to tokens of this kind.

Yet if any happen, either in this case or that, to consider both the nature of the part, which was wounded by the external injury, and the kind of symptoms which have come on; that is to say, convulsions, from whence most of the circumstances of disease, that happen'd not only in that virgin, but in this young man, might arise; for the vessels being constricted here and there, and the motion of the lymph and the blood being retarded for a long time, not only a syncope, but extravasations of water, and inflammation of the lungs, are easily brought on; if any one, I say, in consideration of these things, should chuse rather to ascribe somewhat more than the occasion of these morbid affections to the cause which is accidentally applied from without, I shall not contest it with him very obstinately. Farewel.

LETTER the FIFTY-FIFTH

Treats of Ulcers and Sphacelus,

1. **A**S the beginning of the section which is thus entitled, and is the fourth in this fourth book of the Sepulchretum, begins with the consideration of *Achores* and *Tinea*; it does not sufficiently appear, why those observations, also, of *Lepra*, *Pfora*, and of *Tinea* itself, some of which you will at length find in the beginning of the eleventh section, and one near

(*b*) Prædict. l. 2. n. 19. & 20. apud Marinell.

(*i*) Epist. 26. n. 14.

(*k*) N. 45.

the end of the twelfth (*a*), are not comprehended therein. And the reason, certainly, was not lest this fourth section should be more prolix than it ought to be; for those observations which are referr'd to other places, are few, and this section is short; especially if you take away the scholia, and out of thirteen observations, which are propos'd under number ten, you observe that ten have already been produc'd in other places, and that one out of this very same number has been set down twice over here (*b*). Which circumstances I was willing to take notice of, lest you should be surpriz'd, that I, who am determin'd to make no repetitions, should have scarcely any to relate in the present letter.

2. For that I also may begin with achors and scabies: if you should desire to know what appearances were found by Valsalva, or by me, in bodies that had been infected with these disorders; you will readily find them in the tenth (*c*), the sixteenth (*d*), the thirty-eighth (*e*), and the forty-first letters (*f*), and in others. In reading of which over again, I would have you observe, that, in consequence of these little ulcers being dried up, either of themselves, or by any kind of unctions whatever, an infant perish'd by convulsions; a virgin, by a dropsy of the thorax and pericardium; a woman, by an acute fever and tympanites; and a young man, by a suppression of urine: and that the causes of death had arisen from the occlusion of the little ulcers; for, as when open and discharging they kept off diseases, or, as was manifest in the infant and the woman, even remov'd them; so when dried up, they retain'd in the blood those stimulating particles, and noxious humours, which were before eliminated and discharg'd thereby; and which were soon afterwards effus'd, in almost all of them, either betwixt the meninges, or into the belly, or into the thorax, which I found to be full of a blueish water in the virgin whom I have mention'd.

In the beginning of the eighteenth letter (*g*), you will also light on the history of a shoemaker, whose body was cover'd over with a very small scabies. And there consider over again with yourself, I beg of you, that if any one should have attempted to drive this away by an unction, how much more he must have increas'd the diseases of the relax'd and extenuated paries of the left ventricle of the heart, and of the great artery annex'd thereto; which was, internally, ash-colour'd and unequal: and that by confining those erosive particles. This you will believe the more readily, if you now call to mind what happen'd to Trombelli (*h*) from having a herpes repell'd.

Moreover, you will see, that with these observations of Valsalva, and with mine, agree what are advanc'd in the beginning of this fourth section of the Sepulchretum: in one observation, for instance (*i*), on a prince of two years old, in whom the achores having entirely vanish'd, a bloody water, and in considerable quantity for so small a body, was found under the cranium; and in another (*k*), taken from a woman, who having been cur'd of the tinea by lotions, had one hemisphere of her brain putrid, and fill'd

(*a*) In Additam. Olf. 6.

(*b*) § 6. & 8.

(*c*) N. 9.

(*d*) N. 34.

(*e*) N. 22.

(*f*) N. 4.

(*g*) N. 2.

(*h*) Epist. 26. n. 39.

(*i*) Obs. 1. § 1.

(*k*) Ibid. § 2.

with a citron-colour'd ichor. To which if you would have others to add, they will not be found wanting; and in particular two, the one from Schulz (l), showing, what, and how many disorders of the viscera succeeded a very considerable humid, and long-continued scabies, when repell'd by an external remedy; and the other from Lanzonus (m); which shows, that diseases were found in the brain, the diaphragm, and the liver, when an acrid tinea, and a foul scabies, had been remov'd by unction.

3. But even without the dissection of dead bodies, what physician is there who has not seen internal, or external, disorders, often arise from the retro-pulsion of a scabies, or of achores? you remember that Valsalva was consulted in regard to a tumour (n), which, whether it was a real exostosis of the knee, or only bore the appearance of it, had certainly succeeded to the cause whereof I am speaking. And what external or internal disorders Gerbezius (o) saw from the same cause, and among these disorders malignant fevers; which Lanzonus (p) observ'd more than once, and those of a fatal consequence; and, in like manner, that Dethardingius observ'd an asthma (q), and Cummius (r), who is referr'd to by him, an apoplexy; you will learn from inspecting their observations.

It would be very easy to add a great number of others, either if there were occasion, or if I were not about to take notice of them below (s). Wherefore, though I could also produce a great number of my own observations in this place, I will give you no more than two, and those made both in one month; I mean in February, of the year 1710, on two noble fellow-citizens of mine.

In one of these gentlemen, little ulcers of the head, just like those that we call achores in infants, had been dried up by the injuries of the nocturnal air; when, scarcely eight days having pass'd from that time, he was seiz'd with a malignant fever, attended with vomitings, and finally with a singultus: in which fever; although the pulse was very weak, and other bad symptoms were not wanting, besides those that I have mention'd; he, nevertheless, always seem'd to himself to be in good health: for this reason, his physician, who was a man of age and experience, was not call'd in till late; when, notwithstanding he did whatever lay in his power, and notwithstanding I also was call'd in on the last days, and both of us did whatever we thought most proper, he perish'd on the ninth day of the disease.

The other labouring under a very similar disorder; if you consider'd the erosion of the skin, and the crusts with which the arms were first affected, soon after the legs also, and finally some other parts; and having, by the advice of I know not whom, made use of a shirt medicated with the fumes of sulphur, got rid of almost all the disorder of his skin indeed, but was, at the same time, seiz'd with rheumatic pains of the whole body, join'd with a

(l) Act. N. C. Tom. 1. Obs. 231.

(m) Eph. eorund. Dec. 3. A. 9. & 10. Obs. 16.

113.

(n) Epist. 50. n. 13.

(o) Eph. cit. Dec. 3. A. 2. Obs. 167.

(p) Ejusd. Dec. A. 9. & 10. Obs. cit. 113.

(q) Append. ad Dec. 3. A. 5. & 6. n. 8.

in Obs. Parallel. ad Obs. 58.

(r) Dec. 1. A. 1. Obs. 58.

(s) n. 7.

fever; which not only prevented him from sleeping in the night, but also, in the day time, render'd him incapable of turning himself from one side to another: and indeed began to affect even the tongue itself, and the œsophagus.

I endeavour'd to obviate these symptoms speedily and diligently. But if nature had not assisted us, by expelling the repell'd matter, partly to the skin, and partly to the intestines, where it tended spontaneously, we should certainly never have seen these pains critically solv'd within a month; nor the skin perfectly heal'd within the next spring: nor would the patient have got safely over this disease, so as to live to an extreme old age.

Indeed there is no physician whatever, to whom cases of this kind, as I said, have not occur'd; even from the very time in which Hippocrates, first of all (*t*), took notice of that Athenian, who, being affected with a very violent prurigo of the whole body, and having such a thickness, and appearance of skin, as resembled a leprosy, made use of the warm baths that are in Melos, and “was freed from the itching, and thickness of skin, indeed, “but became dropsical and died.” Martianus (*u*) suppos'd; that the waters of these baths were sulphureous: Pliny certainly has said (*x*), that “in “the island of Melos was very excellent sulphur:” and Dioscorides asserted, that it was “generated there in great quantity.”

4. These things, and those in particular that I have taken notice of, in regard to diseases that follow the repulsion of a scabies by unction, will, without doubt, induce you to enquire of me, what I therefore think of those very minute animalculæ; which, as very industrious men have observ'd them in our age, and have asserted to be the only cause of a scabies, they have also asserted, might be easily exterminated, by sulphureous, and other remedies, which kill these animalculæ, externally applied; and this at any time of the year whatever, and without attending to any internal methods of cure whatever; for that the cause being, by these means, remov'd, the scabies very soon, and very safely, vanish'd; without any inconvenience, not to say any disease, being the consequence.

I however, to deal ingenuously with you as usual; will first admonish you, not to ascribe more to learned men than they claim to themselves. For as to the discovery itself, nothing is more easy than to show, that these animalcules had been already known, even to much more ancient authors than they acknowledge. I do not say to those writers, who I see are objected by some one from Daniel Sennertus (*z*), where he speaks of worms of the back; and still less to those, who have formerly taken notice of the *vena Medinensis*, as it is call'd, after Velschius (*a*), which is also confirm'd by Wepfer, as you will perceive from the preceding third section of the Sepulchretum (*b*). But I say, to those who have spoken of far less, and certainly shorter, animalcules, in the same kind of words as Abinzoar in Joannes Langius (*c*).

(*t*) Epid. 1. 5. n. 4. apud. Marinell.

(*u*) Annot. ad hunc Hippocr. locum.

(*x*) Nat. Hist. 1. 35. c. 15.

(*y*) De Medic. Mat. 1. 5. § 83.

(*z*) Medic. Pract. 1. 2. P. 2. c. 24.

(*a*) Exercit. de Vena Medin.

(*b*) ad Obs. 26. Schol. n. V.

(*c*) 1. 2. Epist. Medic. 42.

For there are, says Abinzoar, "*syrones*, or *pedecelli*, call'd by the Arabians, *affcabat*, which creep under the skin, both in the hands and the legs: they also excite pustules, full of water, under the skin, where they lie hid: which pustules being cut into, the animalcules creep out; but are so small, as scarcely to be found out by the sight, though very quick and piercing."

That the form thereof, was also not unknown to others before, by the assistance of the microscope, is not only shown by the observations of Borelli, that are taken notice of by Velschius (*d*); according to which the *syrones* "resembled tortoises in their forms;" but is particularly confirm'd by that observation, of Etmuller, upon the *syrones*, which being publish'd in the first volume (*e*) of the *Acta Eruditorum Lipsiæ*, besides that it mentions others who had seen them before, gives an idea of the animalcules themselves, both by figure and description; in such a manner, indeed, that the description, and the figure, might both of them be render'd more perfect a few years after, but could not be produc'd in public as quite new discoveries.

Many things also, which relate to the origin of the scabies, the multiplication, and the easy communication thereof by contact; and not only this, but the easy cure of it by certain remedies externally applied; and to other circumstances of this kind, might be illustrated by clear explications. But while that external cure is recommended, without paying any regard to the internal, the same thing seems to have happen'd to these learned men, that happen'd to Van Helmont (*f*), who likewise recommended the former, and disapprov'd of the latter.

For although Van Helmont acknowledg'd, besides the scabies from contact, that also which arose spontaneously (*g*); yet, as he determin'd to each the same nature, so he also fix'd the seat of their semen, or ferment, in the skin only. In which alone, these authors so much the more readily determine, that all the disorder adheres, as in this part only, those animals form their nidusses: and they assert, that if there were none of these animals in the world, there would also be no scabies; as this disorder never seizes upon any one, unless he has got these animalcules from some other place. Let us see then, what the authors of such kind of dogmata will be led to teach from each of them; and what doctrines that are partly true, and useful, in regard to the cure, and partly less true, and less safe, in that respect, will result therefrom.

5. That very prudent, and at the same time, very learned, physician, Ballonius (*h*), having lit upon the opinions of some persons, in regard to disorders of the skin, that agree with those I spoke of just now; in dependence upon reason, experience, and the doctrine of Hippocrates; suppos'd that there are three kinds of disorders of the skin, which are cautiously to be distinguish'd from each other: that some are disorders of the skin itself as it

(*d*) Exercit. cit. c. 7.

(*e*) A. 1682. M. Septembr.

(*f*) Tract. 45. inscripto Scabies & cæt.

(*g*) Ibid n. 11.

(*h*) Epid. & Ephem. l. 1. Constit. Hyem.

A. 1574.

were; some abscesses of the internal parts; and others, of a middle nature, betwixt both.

Nor has he omitted the signs by which we may distinguish the one from the other: nor has he doubted but, where there are disorders of the skin only, “we must then apply ourselves to the cure of that external disorder only, without teasing the internal parts by purgative medicines.”

And indeed he has shown, that those “broad pustules” of Simon; of whom Hippocrates (*i*) has said, “that he found relief when they were anointed by the fire, or wash’d with warm water;” but that vomiting was of no advantage; were certainly of the same nature. And that in particular relates to the point in question, which you will read remark’d upon those words of Ballonius (*k*): “when any one lies with a person affected with a scabies, and the skin is infected, this disorder is really cutaneous, and the cure ought to be quite superficial.”

You see then, what there is true, or useful, in that external cure alone, the internal being entirely omitted, when any person, that is quite in good health, has just before contracted a scabies from the contact of a scabious person, or from the contact of his linen, or clothes: but you see, at the same time, what there would be less true, and less useful, in that same doctrine of cure, if the scabies were not a disorder of the skin alone, but either an abscess entirely, or an abscess join’d together with a disorder of the skin.

Nor can we easily assent, when it is said, that a scabies never arises but from the contact of a scabious person, or from his animalculæ. Does it never rise from nastiness? never from improper eating and drinking? It certainly seems otherwise to most physicians; and amongst these to Sennertus, whom I have commended in the second epistle upon Samonicus, and who wrote the following lines to Samonicus (*l*); if he really did write them, as I have there endeavour’d to show, and explain:

Illotus sudor, vel copia inutilis escæ,
Sæpe gravi scabie correptos asperat artus.

Does it not sometimes arise from violent and long-continued disorders like a crisis? and, to omit other causes, does it not sometimes arise from handling the wool of diseas’d sheep? certainly, what happen’d formerly at Venice, and in the country thereabout, Virgil related (*m*), when speaking of fleeces of this kind,

—— invisos si quis tentarat amictus;
Ardentes papulæ, atque immundus olentia sudor
Membra sequebatur.

But this was not properly a scabies. I grant it. Yet it was a cutaneous infection. And why cannot a more slight infection be communicated in the same way, as this more violent one? Indeed the celebrated Werlhof (*n*),

(*i*) Epid. 1. 6. S. 2.

(*k*) n. 10.

(*l*) De Medic. Præcept. c. 6.

(*m*) Georg. 1. 3. in fin.

(*n*) Disquis. de Variol. c. 4. adnot. 54. in fin.

being induc'd thereto by various observations, asserts, he should readily believe, "that the true human scabies arises, first of all, from the wool of
 "sheep, to which a disorder, not unlike this, is every where frequent,
 "through improper pasture;" for as we almost all of us use woollen cloaths, and wear them for a long time together, "there are perhaps few in which
 "something from unclean sheep, or those that are imperfectly cur'd, is not
 "mix'd: and perhaps it is for this reason chiefly, that the workmen, who
 "are employ'd in the manufacture of woollen cloth, are so much troubled
 "with these disorders."

And Etmuller, the son, had publish'd, at Leipzig, in the year 1731, a *Programma de scabie ejusque ortu ab impura lana* (o), in which, I suppose, he had said the same things that he sent to the *Cæsarean Academy Naturæ Curios.* (p), to be publish'd in the same year, and upon the same subject; ascribing the pustular scabies of a certain girl, to the wool wherewith she cover'd herself, by night, instead of bed-clothes; a part of which wool, had been shorn from sheep that were infected with a scabies.

In this paper he also quotes Coschwizius, who had said, that taylors are more frequently infected with this disorder than others, by their constant handling of woollen clothes. Nor does he conceal the words of Elianus; "that whosoever shall comb the wool of a sheep torn by wolves, and make
 "a garment of it, will excite a scabies on the skin of the wearer:" either because a sheep of that kind, which is weak, from a very violent scabies, is unable to follow the rest; or because, being driven away by the others, lest they should be infected thereby; it, by this means, easily falls a prey to wolves.

Nor are the conjectures of these celebrated men to be slighted; because, in this city, where so many men apply themselves to the woollen manufactory, it is very rare that any one, even of these persons, is found to have a scabies. For there are different pastures in different countries; different waters, and perhaps different methods in selecting and cleansing the wool: and now certainly, if in Venice any considerable infection seizes upon the skin of sheep, their wool is not only rejected; but, lest any one should impose it upon us, it was our advice to the supreme magistrate of Venice, that presides over the public safety, when, in the year 1724, I answer'd upon this question, in the name of the physicians of this celebrated college; to cover, as Virgil says (q), "their carcases, together with their wool, in the
 "ground, and to hide them in pits, and holes of the earth."

6. But what will you say, if the very scabies of sheep were owing to animalculæ, which are transferr'd by means of the wool to men? I do not choose to enquire whether, after so many cleansings of the wool, which are added even by those who dye the cloths, these animals can possibly live; notwithstanding the human animalculæ are certainly destroy'd, when the linen is made clean by washer-women. I rather choose, on the

(o) apud Haller. in Access. ad P. 9. Meth. Stud. Med. Boerth; imo nunc ab eod. exhibit. inter Disput. ad Morbor. Hist. sub. n. CXCIIL.

(p) Act. Tom. 3. Obs. 50.
 (q) loc. cit.

other hand, to ask you to answer these things, which follow from some observations of Hoffmann (*r*), and Junckerus (*s*).

The former of those authors writes, that a scabies had arisen from an unseasonable use of acidulated waters. The other tells us, “that the juice of the birch tree, drunk in a pretty large quantity;” and, in like manner, “that the hot baths of Walckenstein; and these particularly in robust and healthy bodies; are wont to bring on a scabies.” I now, therefore, ask of you, whether you think that in these baths, in that juice, and in those acidulated waters, were to be found these animalcules, of which we are speaking; so as to adhere to the skin while bathing, and to get out upon the skin, after having been taken into the internal parts of the body?

And the former of these authors says again (*t*), “it is necessary to observe, that the scabies, which is communicated by contagion, is always more easy to be cur’d, than that which has taken its origin from the imbred depravity of the blood, and humours:” that is to say, without any suspicion of contagion. He also mentions, as a proof thereof (*u*), the observation of Lanzonus (*x*), (who was, while he liv’d, my friend), of a scabies in a soldier, which encreas’d to such a degree, on the three or four first days of the new moon, that he was oblig’d to pass those days in bed, every month, as long as the scabies continued; and it did continue for seventeen months.

And observations, in part similar to this, that have been formerly remark’d by me, I could produce, and add to those, not only that I have, more than once, seen it happen in scabious persons, that while the fever was at its height, the itching ceas’d, and return’d at the decline of the fever; but that I know it, for a certainty, to have happen’d to a nun, that as often as ever she was let blood; and it was often necessary for her to lose blood; her scabies, which had already grown very slight, always encreas’d to a surprising degree. All these phenomena therefore, and others, which I purposely pass over, being consider’d, I ask of you, to tell me candidly, whether they seem to you to be more easily explicable by supposing the scabies to arise from animalcules, than to take its origin from the blood?

Finally, I would also wish to know, if, in any person, an external cause bring on a very troublesome itching in the skin; as, for instance, the bites of gnats, or injuries from any other little animals of that kind; and this person, indulging the itching, scratches the skin again and again, so that little ulcers arise, and resemble a scabies; I would wish to know, I say, why the same person, or others, may not have an itching brought on from an internal cause, which compels him to scratch, and to lacerate the skin, just as when it is vellicated by those animalculæ?

7. But lest you should happen to suppose, that I am more averse to this hypothesis of animalculæ, than truth and justice can warrant; I will first confess, not only that the origin of a scabies is often to be acknowledg’d

(*r*) Medic. Rat. T. 4. P. 5. c. 5. Obs. 3.

(*u*) Ibid. § 21.

(*s*) Consp. Medic. Theor. Pract. Tab. 90. in Cautel. n. 19.

(*x*) Eph. N. C. Dec. 3. A. 9. & 10. Obs. 205.

(*t*) c. cit. Thes. Pathol. § 24.

from these animalcules ; but also, that they do sometimes really exist, where you would not be very ready to suppose their existence : so easily may they lie hid, by reason of their very minute sizes, when they are transferr'd from one body to another.

Thus I remember that, when I attended an illustrious matron, in the place of my nativity, and she was, at length, recovering from a long, various, and very difficult disorder, a scabies seem'd to be added to the other crises which had preceded ; and this, coming on suddenly, soon occupi'd almost the whole skin, but particularly the palms of the hands, so that she could not sleep by reason of the very troublesome itching.

As I saw very small vesicles in these parts, which were full of water, such as those generally are wherein these animalcules harbour ; I order'd the maid-servants to open one or two of them with a small needle, in a very clear light ; and if they could take out any thing, after pressing out the water, to shew it to me, as I intended to examine it by looking through very good glasses which happen'd to be at hand. You ask me the event of my researches. There was no need to examine for a long time. The animalcule was alive ; and of that very form which the more modern authors had delineated.

I then took away another, and still another : they were all alive, and of the same form. As none of the women who waited upon this lady were, in the least, affected with a scabies ; any physician who had liv'd before Redi and Malpighi, would not have doubted but these animalcules had taken their origin from putrefaction : on the other hand, it was not at all doubtful with me, but some one of the maid-servants had, without her own knowledge, brought one home to her mistress adhering to her clothes ; and that this had brought forth others ; and these still others, in a short time ; in consequence of their being extremely fruitful.

Nor do I confess this only. But if you would chuse to suppose, that the same thing which happen'd to this matron, happens to all those that are affected with a scabies, and that this one cause is always the efficient cause when a scabies is produc'd ; I myself, indeed, will not readily believe it, but will suffer it to be believ'd by you a little while, till I, nevertheless, shew that it is by no means safe to cure a scabies, which has arisen even in this manner, by an external cure only, and neglect the internal : unless, perhaps, in a body, as is said above, which was before in good health, and very lately infected by the contagion.

For what, I beseech you, is a scabies, from what cause soever it may have arisen, but small ulcers, which, if they were join'd in one, would very often be equal to the largest ulcer ? And what physician suffers an ulcer, I do not say a very large one, but even a small one ; whether spontaneously form'd, or by the application of a cautery, or any other external cause ; to be shut up after it has remain'd open for a long time, without first applying a curative regimen to the constitution ?

Yet why this ? Why, because by these emissaries the body had been long us'd to throw out any thing of a deprav'd, or at least of a redundant humour, which it had within it. And why should we not attend to the same thing, in the small ulcers of a scabies of long standing ? for as all of these are nearly the same thing with a very large ulcer, it is the less safe to cure them,
without

without internal remedies, in proportion as they discharg'd the more deprav'd humour from without the body; and in proportion as they sent back into the body the more of the same kind of humour, still more deprav'd in these little ulcers themselves, both by stagnation, and by the external air.

For that excellent archiater Senac (y) shews, with his usual perspicuity, that pus flowing back from external ulcers into the blood, may not only be injurious, in an equal degree with that which is carried into the circulation from internal ulcers; but may be even still more destructive to the vital organs, by reason that this has a communication with the external air, which the other has not. Yet I should never suppose it to have been more injurious to the vital organs, than when it was the cause of the internal surface of the pericardium, and the external surface of the heart, and of almost all the parts which are contain'd in the heart, being render'd scabious, in a boy who had an external scabies; I say, really scabious; for the accurate author of this very rare observation, Buddeus (z), found, by the judgment of his eyes, both when naked and furnish'd with glasses, that the pustules, which were in these parts, were perfectly the same with those on the skin: and this not only appear'd evident to him, but to all that were then present.

Yet the external surface of the body was cover'd over with a scabies universally; what if it had been repell'd? You see, then, of how much importance it is not to drive back a disorder of this kind: and that they do not talk altogether idly, who deny that a scabies is always a disease of the skin alone, and consequently that remedies are to be applied to the skin alone; neglecting the cure of the remaining part of the body: and not only, if this be neglected; but attempted in such a manner as to disturb the motion of nature, when verging to the skin; sometimes death, and at other times various disorders, are the consequences.

Read, in the sixth volume of the *Acta Naturæ Cur.* the sixteenth observation, which is that of the celebrated Carlius. And suppose these things to be said, by me, to shew you how much prudence is requir'd in physicians, who take upon them to cure scabious persons; and how much it behoves them to apply themselves in order, and with propriety, to the cure of the several disorders, either of the primæ viæ, or of the obstructed viscera; whether these disorders arise from the quantity of humours, or from any other depravity whatever. And among these last-mention'd disorders, we must never forget that which, as long as it subsists, requires a scabies by way of a kind of chronic crisis.

You will find examples of this kind from the observation of the celebrated Carlius (a), whom I have commended: both in a man who; having driven away from the nape of the neck, by means of a certain liniment, a scabious efflorescence, which often recurr'd; fell into epileptic convulsions, which were remov'd by the return of that efflorescence: and in another man, and in a certain woman also, in whom an efflorescence of this kind (which had for a long time affected the hands) being dried up, he foretold that a fever

(y) *Traité du Cœur*, l. 4. ch. 3. n. 6.

(z) *Commerc. Litterar. A.* 1745. Hebd. 42. n. 1.

(a) *In fine.*

was at hand; and foretold the termination of the fever, when the efflorescence return'd.

And yet it occupied only a small part of the body, and had, in neither of these two, been repell'd by any external remedy. What then? where the scabies occupies the whole circumference of the body, and not only vanishes of itself, as in a person of whom Lanzoⁿus speaks (*b*), who had been always scabious from his birth; but is even driven back by a fulphurated ointment, or any thing else of that kind, as in him of whom Apinus (*c*) gives the relation; and in those young men spoken of by Jo. Sebast. Albrechtus (*d*)? is it to be wonder'd at, if a malignant fever, or other considerable disorders, and particularly an asthma, come on, which cannot be subdu'd, but by the return of the scabies, either spontaneously produc'd, or by the help of proper remedies?

Thus the cause of the disorders is shewn by the very cure: that is, it is shewn to have consisted in that deprav'd matter, which, as it is injurious when retain'd internally, so when it is again discharg'd from the blood, frees us from the disorder. To this question belong the observations of our Rammazzini (*e*), made upon many persons, who, having repell'd a scabies by unctions, were afterwards seiz'd with a fever, during which they discharg'd black and fuliginous urine; yet the same persons, after the scabies had been, by the help of remedies, brought back to the skin, excreted urine like that of persons in health: and when this disorder was again repell'd, or broke out again, they shew'd this reciprocal change in the urine.

For which reason, that very cautious physician, particularly following the examples of Hippocrates, and the opinion of Ballonius, which I have produc'd above, conceiv'd that the scabies is not always a disease of the skin alone, and consequently thought (*f*), that "to drive it away by topical remedies alone," always, and without distinction, "was an attempt full of danger." To Rammazzini add another very experienc'd physician; I mean Hoffman (*g*); who "places external remedies as the last in order," in a disease of this kind; and would previously "correct, by means of proper internal remedies, the viscid, acrid, and corrupted mass of blood and humours." For he was wont to find the blood, when taken away in diseases of this kind, "so viscid and condens'd into a coagulum, as it were, that it was difficult to divide it."

8. But you will say, that the urine is not always black in case of a repell'd scabies: nor do we see this kind of blood always in scabious persons; and you even object to me my own observations, that I have written to you heretofore (*h*): as if, in fact, I had observ'd the blood to be in a very good state, in persons affected with a scabies; and not to be differently affected in other persons; or, as if, though there are various kinds of scabies, there could not be various disorders of the blood, or various degrees of disorder;

(*b*) Eph. N. C. Dec. 3. A. 3. Obs. 31.

(*c*) Dec. ead. A. 5, & 6. Obs. 117.

(*d*) Commenc. Litter. A. 1742. Hebd. 5.
n. 1. M. Mart. & A. 1743. Hebd. 14. n. 1.
M. Febr.

(*e*) Constit. Epid. Urb. A. 1691. n. 32.

(*f*) Ibid. n. 28.

(*g*) C. 5. supra ad n. 6. cit. in meth. med.
§ 15. & in thes. patholog. § 19.

(*h*) Epist. 49. n. 25.

or, what I would wish you principally to attend to, as if I had undertaken to prove any thing else to you than this, that it is by no means safe to neglect methods of internal cure, and to drive away a scabies which is not recent by external remedies alone.

And certainly, as in many persons affected with a scabies, the whole of the disorder is not in the skin, as the observations, made by me and by others, testify; how could it be safe to apply a cure to the skin promiscuously, in all persons, and neglect the internal parts? a purgation of which, if not in all persons, at least in those whose natural emunctories are not equally open, was made in part by the ulcerated skin, or at least might have been made.

What can be said to these things? Why this I suppose, that physicians are not wanting, who testify, on the other hand, that what we deny to be safe, had always succeeded well with them, promiscuously, in any scabious patient whatever; and without any detriment being the consequence thereof. But as we do not call their observations in question; so we think it but just that they, in return, should not call into question our observations, and those of the great number of other physicians that I have refer'd to above (*i*).

To which you will add other observations of Hoffman (*k*), and of other physicians, who are quoted by him (*l*). By these, and others, that I designedly pass over, it is made evident, how many and how violent disorders have been the consequence of a scabies being thus repell'd: and of course, it is certain what it is most safe to determine, in regard to that method of cure which has, at one time, one event, and at another time, another.

9. But as sulphur is made use of, among other things, against a scabies, we will add some things, in particular, in respect to this remedy. This remedy is applied externally in unguents, lotions, and even in the clothes we wear; either by the fumes thereof, as I have said above (*m*), being applied thereto, or rather by medicating them with a decoction thereof, and afterwards drying them in the sun, or at the fire, which Willis (*n*) recommends as the more easy, and much more elegant method; although I am in doubt, whether it is quite "without any disagreeable smell," as he asserts.

But, internally, it is us'd in one way by the physicians, and in another way by the common-people.

And as, in regard to the external use, which is at one time to be commended, and at another disapprov'd, we have already spoken sufficiently; now hear the manner in which the common-people make use of sulphur against the scabies, and what inconveniencies and injuries sometimes happen therefrom. They take sulphur beaten into a powder, throw it into any wine but red wine, and drink it together with the wine.

And I knew a young woman, who, having taken some in this manner, soon after felt so great a disturbance in her head, that she seem'd then to herself to be almost mad; I suppose, in consequence of the irritation of the stomach being immediately propagated to the brain, in the same manner that Boerhaave (*o*) did not doubt but opium acted, even while it is as yet in the

(*i*) N. 2. 3. 7.

(*k*) § 15. *supra* ad n. 7. cit.

(*l*) In *ines. pathol.* *ibid.* cit. § 18.

(*m*) N. 3.

(*n*) *Pharmac. Rat. S.* 3. c. 6.

(*o*) *Prælect. ad Instit.* § 857.

stomach, and did not need that long passage through the chyliiferous ducts; for having open'd a dog, that was now almost in convulsions from the effects of opium, which he had swallow'd, he had found the opium still in the stomach. Be this as it will; that sulphur acts on the stomach itself, you will learn or suspect from one of the observations which I shall immediately add here, if not from both of them.

10. A woman, of forty years of age, who was addicted to the use of wine and tobacco, more than became a woman, and had been married, to a porter that was a robust man, but had never borne children, having drunk sulphur in wine, more than once, in order to drive away a scabies, which she had contracted, and last of all in a much larger quantity; began, soon after, to be very much disorder'd, vomited several times, and came thereupon to the hospital: being already troubled with a fever, her pulse being hard and contracted, and she complaining of a great streightness in breathing.

For this reason fresh-drawn oil of almonds was given, and blood was taken away. The day after, her respiration being still more confin'd, blood was again taken away: and it was like that of the day before, of a firm and dense crassamentum, but cover'd over with no crust. When the cause of the disease was heard, two glasses of milk were also given. But the difficulty of breathing being encreas'd, the patient being troubled with evident convulsions of the limbs, and the pulse growing more languid, she died, so as to put an end to her disorder within about four days, after the beginning thereof.

The dissection of the body was perform'd, not only with a view to find out the cause of the disorder, but also to instruct the students in anatomy; for it was almost the latter end of November, in the year 1744: and the dissection was perform'd in the hospital, thirty hours after the time of the patient's death.

The body had a good appearance; except that the skin was here and there deform'd with a small scabies. The abdomen, however, was tumid: and this not from too much fat; for as the fat was very well-condition'd, so it was in a very proper quantity: nor yet was this tumid state of the abdomen owing to the extravasation of a great quantity of water into the belly; for although a considerable quantity of this fluid was there, it nevertheless did not appear to be out of the pelvis.

But the stomach, the small intestines, and the colon, for a considerable extent; for in other places it either preserv'd its natural latitude, or was very much contracted, which we observ'd more on the left side, near to the stomach; being, themselves, distended with air, had distended the abdomen. The omentum cover'd no intestines, by reason of its being forc'd, or drawn upwards; for this part, and that upper part of the mesocolon, which supports the transverse arch of the colon, were rigid, and distinguish'd, here and there, with red spots; but particularly on the back part.

On the external surface of the stomach, the blood-vessels were pretty turgid. And the internal surface, where the fundus came very near to the antrum pylori, show'd an area of a circular form, the diameter of which was about four fingers breadths. This area was distinguish'd, from the remaining surface of the stomach, by these circumstances, that it was less smooth, and less shining, considerably more white, and furnish'd with vessels that were

black, as if from injection; whereas, in other places, a smoothness, a brightness, a less white colour, were every where seen; but scarcely any vessels; not to say that they were not render'd conspicuous in the same manner, or of a black colour: so that it was evident to every one; that, as far as this whole area extended itself, so much of the internal lamella of the stomach had been eroded.

Nor besides this, not even in the neighbouring œsophagus, or intestines, could I observe any thing which signified erosion, or inflammation. As this stomach was bigger than the stomach naturally is, so it was without any rugæ, and had its parietes very thin: and scarcely did it retain any traces of the ring of the pylorus. The latter of which appearances, if not the effect of original formation, or from some other more ancient cause, might, together with the others, be owing to the frequent distentions of this viscus, in a drunken woman; and particularly to its late distention, from included air. The other circumstances of disease that I observ'd in the belly, are briefly these. The gall-bladder was considerably shrunk, and contain'd but little bile. The kidneys were lax. The great artery was very narrow.

I then inspected and dissected the genital parts with accuracy, as the woman had been barren. The testes were small and contracted, even more than they are wont to be at that age. From the left was universally prominent an hydatid of the bignets of a small grape. The uterus was inclin'd to the right side, and had its fundus rather small: for which reason the thickness of the cervix, that was greater than it ought to be, and especially at the lower part, was more worthy of remark; as that of the corona itself, with which the osculum uteri is circumscrib'd, was also: for the osculum was here small, as it is in virgins, and of a circular form.

From this orifice distill'd a humour like milk in its colour, and not more fluid than this, nor of a bad smell; yet in a quantity which was very considerable: so that the woman seem'd to have labour'd under a uterine fluor. And that the source of this discharge was higher up than the lower part of the cervix, was shewn by the dissection of this part. For there the vesicles of the cervix contain'd a mucus, which seem'd to be more fluid, and yet not milky. Above there appear'd none even upon dissection. About the middle of the length of the cervix, I found, in two places, by cutting deeply within the thickness of the parietes, an empty roundish cellule, capable of containing a small pea, and without any signs of erosion, either there or in any other place.

Upon opening the thorax, I found, very evidently, what I had before suspected, from the vertebræ of the loins beginning to be bent slightly to the left side, that the woman was gibbous; for the vertebræ of the thorax were much more bent to the right side. But if the case had been different, or if the uterus, which I said was inclin'd to the right side, had been, like the vertebræ of the loins, inclin'd to the left side; I should have added this woman to the others whom I have already spoken to you of (*p*), when writing of the inclination of the uterus. But the inclination of the spine, at the

lower part, was here very slight; and such as the *ossa innominata* would not easily follow, as they did in those subjects.

However, I found no water extravasated in the thorax, or pericardium, as I did in the belly. The lungs, anteriorly and laterally, were connected very closely with the pleura: they were tumid besides, and especially the left lobe, but only from the air, and a fluid that was mix'd therewith; for they were in no part hard, or more red than was natural. The ventricles of the heart contain'd a coagulated blood: and that blood was black, as it was in other places also.

Upon opening the cranium, all the parts which were within it, seem'd to be considerably more lax than they ought to have been, on the eighth day after death; for so many days had the accurate dissection of the other parts taken up. The vessels that go through the *dura mater* were turgid with blood; and in the *plexus choroides* I observ'd vesicles full of water, in great number, and not very small. Finally, all the parts that were within the cranium being taken away, those surfaces of both the petrous processes, which look one upon another, and the neighbourhood thereof, were seen to be not smooth, but unequal.

11. A porter, the husband of the woman I just now spoke of, of a tall stature, and, although of a somewhat pallid face, and a habit of body inclining to leanness, robust nevertheless; being almost of the same age with herself, and equally given to drinking, was affected with the same scabies, and made use of the same remedy as she: but I believe not in the same quantity. After her death he continu'd in pretty good health, to all appearance, for almost six months; at the end of which he was seiz'd with a fever that seem'd to be slight, but was, in effect, so fatal, that he lay in the hospital but two days before he died: and this was about the middle of May.

On the first day, the pulse and the other symptoms were not very bad; if they had not been render'd suspected by a kind of anxiety and inquietude. On that day, as is generally practis'd with most others in the beginning, a medicine was given to cleanse the stomach and bowels, with gentleness. On the day following, all those evils, which I shall relate to you, came on; so that remembering how his wife was, they gave him milk. For he vomited: he was troubled with the same straightness of respiration that his wife was formerly: he was convuls'd in his whole body: he was, moreover, violently delirious: and in his delirium cried out that his belly was on fire. And in this manner his life was finish'd, before the third day after his coming into the hospital.

On account of this shortness of the disease, it happen'd that the body was dissected before I knew of the man's being sick; which was a circumstance that was very far from being pleasing to me. Yet the body was dissected by a very attentive and intelligent pupil of mine, who is now deservedly an eminent physician at Feltri; I mean, Anthony Guilermi: and from him I receiv'd the following account.

The belly being open'd, in the omentum, and the pinguedinous appendiculæ of the intestine colon, and particularly in those that were near the spleen, as also in the adipose membrane, as it is call'd, of the left kidney,

the

the fat, which was not in great quantities, was of a brown colour and somewhat livid. And as to the colon itself, it was three times more wide than usual. The stomach was contracted, of a brown colour externally, and internally inflam'd, without any erosion, to the breadth of the palm of a man's hand, where it was turn'd towards the spleen. The lower edge of the liver was livid, and of a blackish colour; yet not to a very great depth.

Upon opening the thorax, the lungs and the heart, as well as the diaphragm, which was examin'd on both surfaces, were found to be in a natural state. In the ventricles of the heart were small polypous concretions. The head was not dissected.

12. I enquir'd whether the skin had retain'd any thing of the scabies, and, in like manner, whether the man, after drinking the wine and sulphur with his wife, had taken any more. To both of which enquiries I was answer'd in the negative. This, however, was added, that the wine which both of them had made use of, was kept in a brazen vessel. On hearing of which, as I did not doubt but this very pernicious disorder was an inflammatory fever, so I saw that it might be doubted whether the scabies, which, indeed, had been repell'd, without any proper method of internal cure, had left such particles in the blood, as were, in some measure, the cause of this very great injury; and, in like manner, as the stomach was the seat of this inflammation, whether this did not happen the more easily, because it had been already somewhat weaken'd by the drinking of that wine. At least, you have read what injury the stomach of his wife receiv'd therefrom; whether this arose, in part, from the noxious quality of the brass vessel wherein it had been kept, or only from the sulphur that had been mix'd with it.

For how injurious sulphur may be, the ancient physicians had formerly known, from whom Pliny (*q*), took this dogma, that asses milk was useful "against gypsum, cerusse, sulphur, and quick-silver;" notwithstanding Dalechampius (*r*), is needlessly afraid, lest, though they had perhaps written *σφύρον*, that is the *solanum manicon*, Pliny had read improperly *σειον*, that is sulphur; for it is not probable, that among those things which Pliny speaks of, as belonging to the mineral kingdom, as it is call'd, a vegetable should have been interpos'd in that passage which Pliny has copied: nor is the difference of the writing so inconsiderable, as easily to deceive the eyes of a person who copied the passage.

But even Galen has plac'd sulphur among those things (*s*) that "create ulcers in the parts to which they long adhere:" and Haly Abbas, whom Ardoynus (*t*) commends and follows, has said, that a man who drank sulphur "had a cutting, burning, excruciating pain in his stomach, and ulcers in the intestines." Yet I would not have you believe, that I attribute this destructive power to every kind, to every preparation, to every mixture, and to every dose of sulphur: for I am by no means ignorant that sulphur has been commonly given against the scabies, not only by the modern physicians, but sometimes also by the ancient physicians.

(*q*) Nat. Hist. l. 28. c. 9.
(*r*) In Adnct. ad eum locum.

(*s*) De compos. medic. l. 6. c. 2.
(*t*) De Venen. l. 2. c. 15.

But it is certain that the woman, of whom we speak, had taken it in wine which had been preserv'd in a brazen vessel, and in too great a quantity : but whether she took it in a pure, or an impure state, is by no means certain.

I would have you examine those authors who have admonish'd us what may be mix'd with it in the very mines from whence it is dug ; or, at least, what Waltherus (*u*) has briefly hinted, when he says, that “ we must examine
“ whether the mines, which supply the *sulphur vivum*, do not produce, to-
“ gether with the sulphur, minerals that are in other respects hurtful : and
“ that we ought to be particularly afraid of arsenic being join'd with many
“ species of sulphur : for thus he had known, that, from a scruple of crude
“ sulphur being taken into the stomach, a vomiting, tormina, and tenesmus
“ had been excited : and, indeed, although the sulphur had been frequently
“ boil'd in water, and dissolv'd over a gentle fire ; yet, in many persons, stools
“ had not so much been the consequence of taking it, as tormina.”

And as to that with which arsenic is join'd, this certainly ought not to be applied externally to the ulcers of scabious persons, as appears from the effects of cobalt ; which as the celebrated Jo. Adr. Sproegelius (*x*) justly affirms “ to be of the same nature with arsenic,” so he relates that this metal, being sprinkl'd upon the head of a scabious girl, had brought on a very miserable death within a few hours ; and that the same thing had happen'd, not only to a scabious dog, from cobalt, but to three others, in which he had made a slight incision of the skin, and applied arsenic by sprinkling : and he adds, that even greater marks of disease were found by dissection, than if he had given them so much arsenic by way of the mouth.

However, to the case of that girl you will add a similar one in another girl, who was affected with a *phthiriasis*, or lousiness, of the head, as related by Harderus (*y*) ; and to the experiments, those examples which Etmuller the son (*z*) has produc'd from Fabricius Hildanus, Janus Antonius Saracenus, Amatus Lusitanus, and others ; that is to say, of death, or of the most violent symptoms, being brought on from the application of an ointment, wherewith arsenic was join'd, to ulcers ; and even to the scabies itself.

And to this subject, also, probably belongs that more ancient observation of Baccius (*a*), of arsenic being sprinkl'd upon a phagedenic bubo ; to which inspersio death succeeded, after three days, by such violent vomitings of an æruginous humour, that a suspicion arose of sublimated mercury having been privately given.

But there is no doubt of the late observations of that very experienc'd surgeon Goulard (*b*), being relative to this question, as they agree with others which he refers to from Morand ; observations, for instance, of acrid and eroding medicines being applied to the fungous flesh of ulcers, and

(*u*) Progr. de Sulph. & Mart.

(*x*) Experim. circa varia venena, &c. § 28. & Exp. 36.

(*y*) Sepulch. in Additam. ad Sect. 11. l. hujus 4. Obs. 13. Hist. 13.

(*z*) Eph. N. C. Cent. 3, & 4. Obs. 127. in Schol.

(*a*) De Venenis, &c. ubi de Venen. quæ extrinsecus, &c.

(*b*) Memoire sur les Maladies de l'Uretere.

having their small particles taken into the blood, in such a manner, that the patient died with all the symptoms of poison; though in the mean while no-body suspects the true cause of his death. And if you consider all these things maturely, you will also gather from thence, how easily the particles of erosive matter, that is proper to scabious persons, may be carried from their little ulcers into the circulating fluid.

But, before I make an end of writing upon the subject of the scabies, you will, perhaps, ask, why I never made mention of the sebaceous glands of the skin, and of the matter secreted therefrom? When the question was of *Sirones* (c), I thought it superfluous to put you in mind, that a certain appearance of worms must not be confounded therewith, as was formerly done; since in this present state of anatomical knowledge, to the increase of which I have labour'd with all my little abilities, I see that it is asserted, even by tyros in medical knowledge, “ that the worms which infest the skin
“ of children, are nothing more than a deceitful appearance; and are, in
“ fact, filaments press'd out from the sebaceous follicles of the skin, as is
“ sufficiently and clearly determin'd.”

And, indeed, I have heard that, as there is an endemic disorder in Finland, which they call *Brest*, and which makes great havock among children, consisting in very small tubercles of the whole skin, that are extenuated into a kind of worms; I have now heard, I say, that this disorder is accounted for, by learned men, from an obstruction of the sebaceous glands of the skin: perhaps, because the matter, secreted by these glands, being in a very thick and tenacious state, is, for that reason, while it comes out in a very slow manner, form'd into filaments, which not only retard the discharge of the matter that ought to be excreted in succession; but also prevent the very necessary discharge of insensible perspiration, by compelling the matter, that lies obstructed in these follicles, to press upon the neighbouring sanguiferous vessels all round.

You see then, why, in speaking of the *sirones*, I thought it unnecessary to take any farther notice of the sebaceous matter: perhaps this might have been done with more propriety in other places. For as the secretion of this oleose matter seems to be intended not only for other uses, but particularly to keep the skin soft and flexible, and to defend it against the effect of eroding bodies; it follows, that where this secretion is either prevented, or deprav'd, those disorders must easily arise which are observ'd in cutaneous infections.

Thus in the elephantiasis, as some understand this word, the skin becomes rigid and inflexible: although this happens sometimes even without an elephantiasis, as it did formerly in a woman whom Jo Fred. Helvetius, as you have it in Stalpart (d), cur'd within the space of three weeks; and in another describ'd by Diemerbroeck (e); for another I suppose it to be, when I compare the descriptions together: and, finally, in that Neapolitan woman whose disease and cure are describ'd, as you know, by Charles Curti (f).

(c) N. 4.

(d) Cent. Post. P. 1. Obs. 43.

(e) Anat. l. 8. c. 1.

(f) Discuss. d'un raro morbo cutaneo.

As to what relates to erosion, however, it is natural to suppose that this happens much more easily in those in whom the scabies does not come by contagion; but arises from the eroding corpuscles, which are so redundant in the blood, that even by infecting the sebaceous matter, they not only render it unfit to defend the skin, by its unction, from the irritating salts of the sweat; but, on the contrary, render it very fit to irritate and erode.

Why then, you will say, have you not hinted at these things above? Why, in fact, I did not touch upon this subject, lest I should either seem to set more lightly by some celebrated men than I ought, or should seem to challenge them; if I either entirely neglected, or undertook to discuss, those things which they advanc'd some years before, of the sebaceous glands, and of the matter secreted therefrom.

For such a discussion, moreover, this is not a convenient place; as it would give occasion to a long discourse, that would be disagreeable to you; and still more to myself, by reason of the repetition of those things which I have said sufficiently at large above: and that would be frequently necessary. Both of which circumstances you will naturally conjecture, from the few things that I shall briefly point out. There are sebaceous glands, say they, “in the trachea, in the alimentary canal, &c.” But do you read the thirteenth animadversion of the fourth of the *Adversaria*.

They could “never find” sebaceous glands scatter'd up and down, in the skin. Do you, however, examine numbers three and four, in the third of the *Epistolæ Anatomicae*.

Yet they have seen “on the skin of the face, the breast, and the arms, “of some men, small black points;” and not only these little points, but have seen “an unctuous matter, resembling a round worm, press'd out therefrom:” and they therefore say, that there are, “in the skin, certain “very small cavities, which are found to be larger than their orifice;” but they contend, that these things which they have seen “are not present in a sound state.”

You must, therefore, look again to those passages which I have pointed out in my writings, and others: or, rather, you must examine the *alæ nasi* in most men, and in those that are found and healthy too. What then do they say these cavities are? A *sheath*, which before embrac'd the root of a hair that is now destroy'd. And here it becomes necessary for you to read number twelve of the first of the *Adversaria* (g), and the thirty-third animadversion (h) of the fourth of the *Adversaria*; for in the former passage, I first hinted a doubt against the sebaceous glands, from the receptacles of the hairs; and, in both places, I have not spar'd to mention some things that are contrary thereto, or at least that limit its extent: to which you may now add, that those cavities would not have been the largest in the *alæ nasi*; that is to say, where the hairs were the smallest.

And that *vagina*, or *sheath*, is fix'd in the fat, under the skin; for they think “that the opinion of Columbus is supported upon truth, to wit, that “all the hairs fix their roots in the fat.” But neither has Columbus said

(g) Versus finem.

(h) In fine.

all, nor have I said *all*, when I first also produc'd his opinion; as you will learn from the fifth animadversion of the second of the *Adversaria*.

For I not only knew that there are hairs, whereby we cannot shew that the whole thickness of the skin is pervaded; but I even saw that Columbus himself, among the others which are fix'd in the fat, had expressly excepted those which are in the scrotum: and that to these, others ought to be added; as, for instance, those that arise from the neighbouring integuments of the penis, and those very slender ones that arise from the pinna of the external ear, and from the caruncula lachrymalis.

Do not, however, imagine, that those sheaths of the hairs, which are substituted in the place of the sebaceous glands, are fix'd down in the fat for this reason, that they may take up an oleose matter from thence. From these sheaths, indeed, a matter is said to be discharg'd which is call'd sebaceous; but at the same time it is said not to be oleaginous, because linen-rags, or lint, "plentifully moisten'd" with this matter, "resist the flames for a very long time;" as if, truly, we denied that nothing besides this, either of the matter of sweat, or insensible perspiration, adher'd to the linen; or, as if we had denied that this was any thing but pure oil: neither of which could ever come into my mind, as I every day see with how much ease the fordes of the skin are wash'd off with water.

We, therefore, believe it to be sufficiently "of a saponaceous nature," not only by means of somewhat being mix'd therewith externally, but also internally; and yet not "as all the humours of our body are," but in a peculiar kind of manner: and from hence it happens, that if it be examin'd with the eye, and with the hand, immediately upon its being secreted from a sound body, and the effects of it consider'd, it is clearly perceiv'd how much it differs from the other humours.

And I would also have you transfer these things to that sebaceous matter which is separated, about the eyes, from the glands of the tarsi, and the neighbouring caruncle; for this is also mix'd with the lachrymal humour, that is constantly secreted. In which glands, and caruncle, and in the neighbourhood thereof, what my labour formerly did, I might say to some others, who have shewn, in describing them two-and-twenty years ago, either that they are ignorant of the history of anatomy, or, if they know it, that they too openly dissemble. But I do not think this worth so much notice: and I already seem, to you, to have forgotten that this, as I said above, is not the proper place for discussions of such a nature.

13. Let us go on, therefore, from the scabies, that is, from the smaller ulcers, to the larger. I never remember to have seen a larger than in a rustic man, who, when shut up in a stove, suffer'd, at first, from the unskillfulness of a surgeon in applying too much heat; and, after that, by his obstinacy in neglecting the complaints of the poor man, who cried out that he was burnt: for he did not take him out before he was half burnt in the whole outside of his body.

Wherefore, although the skin only was externally ulcerated; yet the very size of the ulcer brought the man to the end of his life, by the most continual and incredible tortures: and that within the space of two or three days, in the hospital of Incurables at Bologna; where they had carried him soon

soon after the accident. A case not far unlike this, you will read the description of by Ledelius (*i*); but a juvenile age, a very speedy cure, and not an equal ulceration in all parts of the skin, as appears from the difference of the pains, suffer'd a more happy event to the disease.

Mention is made of old ulcers, in the observations I have sent to you, even more frequently than of the scabies. And two of these (*k*), particularly, confirm what I said of the purgation which is made by the scabies (*l*). For when an ulcer, and a scabies, afflicted one person at the same time, the former began to be much more troublesome, and painful, upon the vanishing of the latter; though the scabies was not moist, but dry. And, on the other hand, upon the closing up of ulcers, which appear'd from cicatrices on the tibiæ, ill-condition'd pustules had occupied almost the whole skin.

As to what has been said of the scabies, that it must not be driven away by external remedies merely, unless when it is recent and contracted by contagion; because, otherwise, the discharge of noxious humours, which us'd to be thrown out thereby, would be by this means prevented, as well as the absorption of those humours which us'd to be carried inwards therefrom; the same may be, with justice, said of other ulcers also, as appears from the remainder of our observations. For ulcers of long standing, whether spontaneously or artificially growing dry, or shut up, have had the most violent disorders follow them; particularly disorders of the brain, and sometimes of the heart: and even then, and when ulcers, although not yet shut up, had been long troublesome, you may observe almost always, that there was serum within the cranium, sometimes also within the vertebræ, or within the thorax and belly.

And, rather than repeat these observations here, I chuse to refer you to the letters, in which you may read most of them over again; that is to say, the fourth (*m*), the fifth (*n*), the twelfth (*o*), the twenty-fifth (*p*), the twenty-seventh (*q*), the forty-seventh (*r*), and the fifty-second (*s*).

14. But besides these that belong to the tibiæ, we have often describ'd, in our observations, other ulcers also; as, for instance, at one time, in the observations that relate to the sinusses of abscesses, and to the subjected caries; and, at another time, in those that relate to ulcerated tumours and gangrene. However, I have not leisure here to point out all the places of these observations in particular. I chuse rather to subjoin some, which are referr'd to the two above-mention'd heads, omitting the others which I see are, with less propriety, referr'd to this subject; as, for instance, when in this section of the Sepulchretum (*t*), among the ulcers, is produc'd the case of a fœtus of seven months, that was without a brain: which case you may compare with those that I have taken notice of, as being thus born, from the observations of ourselves and of others; and, as I think, in a place that is much more proper (*u*) for such observations.

(*i*) Eph. N. C. Dec. 3. A. 5, & 6. Obs. 51.

(*k*) Epist. 21. n. 30. & Epist. 4. n. 35.

(*l*) Supra, n. 8.

(*m*) N. 7. 13. 30.

(*n*) N. 15.

(*o*) N. 2.

(*p*) N. 12.

(*q*) N. 8.

(*r*) N. 4. 33.

(*s*) N. 30.

(*t*) Obs. 1. § 3.

(*u*) Epist. 12. n. 5. & seqq. & Epist. 48. n. 48. & seqq.

In the first place, therefore, as to what relates to the former of these two heads, I mean to the sinusses of abscesses, one of my cures of this kind particularly comes into my mind; and this I shall so much the more willingly relate here, as it was perform'd by means of that remedy, the peculiar efficacy of which against even minute ulcers; that is, against the scabies spoken of above; I see is now call'd in question by some persons: and in particular by a physician, in other respects very experienc'd.

Lodovico Albertini, arch-deacon of the church of Forli, an equally noble and pious old man, began, in the spring of the year 1711, to be troubled with a kind of *dysuria*; and while they endeavour'd to mitigate this disorder, by emollient and demulcent remedies, the left leg was first seiz'd with a pain, and after that with an abscess. As from this abscess, after being open'd, pus continued to flow for a very long time, in such a quantity, every day, as might very easily carry off a man who was within one year of fourscore; the physician thought proper, in order to prevent the progress of this disorder, to give the decoction of woods, as it is call'd; and the surgeon, to apply such things to the abscess, as should tend to heal it up.

And now the very orifice of this abscess seem'd to be shut up; when, on a sudden, a violent fever came on, which greatly affected the head, and began to bring on a delirium. Then blood was taken from the other foot, and the abscess was again open'd: and by this means, the fever was indeed put to flight; but from the abscess, so great a quantity of pus was again discharg'd, and continued to be discharg'd, that they despair'd of the patient's life; and not without reason. For I, being then call'd in, for the first time, saw that the patient, who had been before of a good habit of body, and robust, considering his age, was now nothing more than skin and bone, and very weak and languid: being never free from fever, and having every now-and-then the most excruciating pains in his leg, which discharg'd every day, from its abscess, such a quantity of pus, as I could not easily have believ'd.

It appear'd to every one, that the patient could not possibly recover, unless his leg was healed. But how difficult it was to bring this about, all the hitherto useless endeavours of the physicians, as well as the care and pains of the surgeon, demonstrated: and to these things was added, the advanc'd age of the patient, the very hot season of the year; for the middle of summer had in the mean while come on; and, what was worse than all the other circumstances, a stomach quite tired out with remedies.

Two remedies, nevertheless, still remained untried: the first of which, I mean broth made from the land-tortoise, his senior physician recommended; and the last, that is the *pulvis viperinus*, another old physician, whom they had sent for from another place some days before, had propos'd, when he quitted the patient. My opinion being ask'd in regard to both these remedies, I did not disapprove the first, if the stomach would bear it: but that it might be the more easily borne, and might be of more use, I said that a greater part of the second should be added, yet in that particular manner which I was about to mention; and that our chief confidence must be placed in this.

I meant by this to say, that what remains in the *pulvis viperinus* does not seem to be of so much advantage as the fresh viper itself, if a quantity of the flesh of this animal were boil'd in thin veal broth, with an equal quantity of the flesh of the tortoise; and the same flesh of the viper that had been boil'd, were beaten up with old *saccharum rosatum*, as it is call'd, and were eaten every day in the morning, drinking after it the broth, of which I have been speaking: and to these I said might be added, betwixt dinner and supper, an emulsion, as it is call'd, of fresh almonds; adding a little sugar, wherewith coral, finely levigated, was mix'd.

The physician was so far from being displeas'd with this proposal, that, as he was pretty far advanc'd in life, and his health impair'd, he begg'd of me, in conjunction with the patient and his relations, that I would see to the execution of the plan I had propos'd. I look'd to it therefore; and, by the blessing of the Almighty, the pains of the legs began to be diminish'd gradually, and the discharge of the pus to be lessen'd to such a degree, that on the fortieth day from the time of beginning this method, the abscess was almost tending to cicatrization.

And although the fever had now long been taken off, and the weakness and emaciated state of body had decreas'd; yet, in order to confirm, and encrease these advantages, I continued, in compliance with the spontaneous entreaties of the patient, and not merely by his consent, to make use of the same method of cure ten days longer. At the end of which period the patient, who had been confin'd to his bed from the latter end of April to quite the middle of September, began to rise; and recovering his health and strength more and more every day after that, not only recover'd his former habit of body, but shew'd me that very leg, from whence so great a quantity of pus had flow'd for so long a time; and from whence so many oblong pieces of membranes had come away, together with the pus; differing nothing at all, either in point of nourishment or strength, from the other, when I happen'd to meet him in the beginning of December: and he liv'd some years afterwards in very good health; till at length he was carried off, in an extreme old age, when I liv'd at Padua.

15. I was impell'd; by more than one reason, to relate this cure to you thus fully. For there are some who ascribe to vipers, properties which they have not; as, for instance, so great a power of warming and drying, as to create an inextinguishable thirst, and to dissipate those few spirits that old men have remaining: for which reason Claudinus admonish'd (x), that the use of them should be forbid to persons far advanc'd in age; and especially in the summer time, and in a warm region.

Redi (y) indeed has observ'd, that no thirst was excited in an old man, or in young men, by a much larger use of the vipers; although it was sometimes summer when the experiment was made. And as I have never observ'd any thirst, or dissipation of spirits, from the use of the vipers, even in this old man, at the most hot season of the year, and in a country that is rather warm; nay, have even observ'd a revival of the strength and spirits, and that nothing was dried, except what I wish'd to be dried up, that is, the abscess; so I

(x) Append. ad Tract. de Ingress. ad Infirm. Sect. 6.

(y) Osservaz. int. alla Vipera.

have, on the other hand, seen the body, in general, always recruited, instead of being dried up.

Others, on the contrary, say, that no more is to be expected from vipers, than “ from the other dried parts of all animals, which are endow’d with a “ kind of gelatinous, mildly sulphureous, and vaporose juice.” You perceive that these things were written in those countries wherein there is not a plenty of fresh vipers. For which reason, I am not surpriz’d, that in these places “ various medicines, prepar’d from vipers, have done nothing in an “ atrophy, a consumption, a scabies, and other disorders of this kind;” or that it should be said, that “ no solid advantage, at least, which can make “ it worth our while to try the experiment, can be expected from these re- “ medies, in correcting the impurities of the blood.” I do not, however, here speak of dried vipers, or of remedies thus prepar’d, but of fresh vipers; for you have seen that I preferr’d the latter to the former; as it was in the case of an abscess, which to that time could not be heal’d: following the practice of an illustrious, and more ancient author, than those whom they commend, I mean Antonius Musa, who, as he liv’d in Italy, and was the physician of Augustus, “ when he happen’d to light on ulcers that had been “ incurable, gave vipers to be eaten; and by this means cur’d them with a “ surprizing celerity,” as Pliny has deliver’d down in his writings (z).

For as to their adding, that “ if any good was done by these medicines, “ it was rather to be ascrib’d to other ingredients that were mix’d therewith, “ and to medicines given in conjunction therewith;” though this might be true of their preparations thereof, yet certainly of the vipers which Musa gave to be eaten, I do not think you can suspect any such thing: as it appears, that they were eaten alone, and not mix’d with other remedies; nor yet of those that were “ prepar’d after the manner of fish,” which a miserable slave, who was cur’d by himself in this manner, had been order’d to feed upon, by that great physician among the Greeks, Craterus; from whom the very learned Mead conjectures (a) that Musa had learn’d this remedy; nor of those which, another very great physician, Aretæus (b), “ gave at supper “ by way of food, boil’d and pickled, just in the same manner as fish,” that is, “ with salt and oil,” as it is very easy to understand from Cælius Aurelianus (c). Galen also (d) ordered the viper-catcher to make use of vipers “ prepar’d in a pot, after the manner of eels.”

But it appears, you will say, that he did not cure the viper-catcher by vipers alone: for he confesses what he did before. But the same does not appear of those two physicians above-mention’d. And if taking away blood, and atrabilis by medicines, had cur’d the viper-catcher, Galen would not have given the vipers afterwards, nor have attributed his cure thereto.

And you may suppose the same thing to be said by me, if you should happen to make the same objection to the cures happily perform’d by vipers, or by parts of them; either by the Greeks, whom I have quoted; or by the Arabians, who were followers of Galen; or by the physicians who have liv’d

(z) Nat. Histor. l. 30. c. 13.

(a) De Venen. Tentam. 1.

(b) De carat. tardar. ægritud. l. 2. c. 13.

(c) Morb. Chron. l. 4. c. 1. vers. fin.

(d) De simpl. medicam. facult. l. 11. c. 1.

in the ages nearer to our own : for these are so many in number, that it would not only take up a great deal of time to mention them here, but it would be superfluous ; as you may see them mention'd in Marcus Aurelius Severinus (*e*).

And though, out of these cures, there are some which you cannot readily admit, yet I do not think you will reject them all as fables, and circulatory frauds ; since the most bitter enemy thereof you can mention, Redi (*f*), has expressly asserted that the flesh of vipers is alexipharmac, and “ a remedy “ against many diseases ;” and his sagacious imitator, Vallisneri (*g*), has openly shown what he thought, when he affirm'd “ that our vipers about Verona “ are more efficacious in the cure of diseases, than those about Ferrara and “ Mantua, and such other moist and marshy places :” and I remember how often he recommended them in his medical opinions, and how often in conjunction with me ; and you may see how often he prescrib'd them in those works that he has publish'd. And, indeed, in those countries where you would have thought that this remedy was less known, you will find that it has been, and is still, in use.

Thus, for the sake of example, Etmuller, I mean the son, although I might quote the father (*b*), and the more ancient German physicians, expressly relates (*i*), that in the neighbouring province of Silesia, “ the decoction of vipers in chicken-broth, was almost universally made use of “ among the richer sort of people, to cure hectic, and impurities of the “ blood and lymph.”

Thus Hoffman himself (*k*) ; I say himself, for he was not always consistent with himself in this respect ; when he examin'd a method of cure which had been improperly begun upon an illustrious man, who labour'd under a spasmodic asthma and a dropsy, whose dissection he also gives ; does not indeed commend the improper time in which both the powder of vipers, and the viper-broth, had been given : but then he commends highly ; for “ it is “ certain from frequent experience,” says he, “ that vipers, given both in “ powder, and in decoction, possess antispasmodic virtues, attemper acrid “ humours, promote transpiration, and for that reason cleanse the mass of “ blood from all impurities.”

So Adolphus (*l*) speaks of a soldier, who “ was freed from a very troublesome disorder, and one that was obstinate against all medicines, by a continued use of remedies, particularly those of the viperine kind.” So, finally, not to omit those things which have been publish'd among the same Germans, while I was writing these letters, Jo. Bapt. Molinari (*m*), a physician whom I have before quoted, commending “ decoctions prepar'd from the vipers “ themselves,” says, “ for they are approv'd by many experiments, both “ those of learned men, and mine.”

(*e*) Viper. Pyth. P. 3. c. 7. & alibi.

(*f*) Opere Tom. 4. Lettera A N N. che comincia *La Vipera*.

(*g*) Opere Tom. 3. nel Saggio d'Istor. Med. alla parola *Vipera*.

(*h*) Schroder. dilucid. de Animal. Cl. 1. ubi de Vipera, & alibi.

(*i*) Eph. N. C. Cent. 7. & 8. in Append.

n. ult.

(*k*) Consult. & Resp. Medic. Cent. 1. Cas. 93.

(*l*) Aët. N. C. Tom. 2. Obs. 158.

(*m*) Specim. de Apopl. P. 2. S. 4. n. 180.

There is no need to speak of other polite nations, since Mead (*n*) heard from a learned physician, who had resided many years at Bengal, that in regard to the very Indians themselves, “ it was a constant custom there, for practitioners to prescribe the use of the viper of that country, by way of diet, to those who had been exhausted by a long disease.”

But these are barbarians, and therefore not so skilful. What then will you say of Mead himself, to whom you cannot well prefer any one of the most eminent physicians, either in point of science, skill, judgment, or authority? He certainly (*o*) judg'd with great propriety of the broth of vipers; their jelly, flesh, and volatile salt; found fault with nothing but the too great sparingness of the English physicians in prescribing this remedy, “ which was proper to answer the best intentions,” and the great efficacy of which he himself “ had seen in obstinate leprosy.”

Shall we say then, that he ought not to have attributed this efficacy to the vipers, but to the other remedies which were mix'd therewith? He had, however, mix'd nothing with them, having only made use of the wine, in which he had macerated two or three vipers in a moderate heat. Nor, to return at length to the patient in question, do I suppose you will readily imagine, when you have consider'd all the other things I gave him, which have been particularly made mention of to you by me, that the cure ought to be set down to the account of those, rather than of the vipers.

But if you should happen to have any doubt remaining, I have other examples of successful cures at hand, in which I gave nothing but the vipers, nor was under a necessity of giving any thing else. For though, in general, as I love to make use of the most simple medicine I can, I give only the flesh of the vipers and the broth, particularly against an obstinate scabies; which, when other remedies were of no effect, I have driven away by this means, so as to make the patients become clean, smooth, and fat; yet it sometimes happens that I have to do with those, who are not only very obstinately averse to vipers in particular, but to almost all remedies in general: and as it necessary to relieve these persons by such kinds of medicines as they themselves could not perceive and observe, I have restor'd their health to them, by the salutary fraud of boiling vipers in the broths which they made use of: and this without their suspecting the deceit.

Among these, in particular, was a noble Venetian senator, whose case was, in most of the circumstances, comparable with the case of the arch-deacon (*p*) already propos'd. For this patient also, when he was a very old man, labour'd under a long continued abscess of the leg, in the summer-season of the year 1732. And, without any other internal medicine besides that I have spoken of, I succeeded so far, that a man of this age should be able to bear so long a disease, and those continual discharges of pus; and should have his vitiated humours chang'd so much for the better; that the abscess being thus heal'd, he return'd to his former strength and plumpness in his whole body, and in that leg in particular, much sooner than could be expected: and for six years afterwards, for he liv'd thus long, he did not need the assistance of medicine.

(*n*) Tentam. i. cit.(*o*) Ibid.(*p*) n. 14.

Will any one say, then, that the veal or chicken-broth, in which I order'd a slic'd viper to be boil'd, both for him and for other persons, was of such an efficacy, that whatever advantage follow'd therefrom, ought to be ascrib'd to this rather than to the viper? Some persons will, perhaps, rather ask me, why that which has succeeded with me; and not only with me, but with most physicians of every age, and of almost all nations; does not succeed with all? as if, except this one, all other remedies answer'd always, and with all persons.

With some persons it certainly has not answer'd; for this very reason, that it has been mix'd with other, and still other remedies. With some, because they did not give it for a sufficient time. With some, because they have been deceiv'd in the choice of the vipers, they not having been catch'd in those regions and places that they suppos'd, nor at the time of the year it was proper they should have been taken. With others, because they lit on such patients, on such a cause, violence, or inveteracy of disease, as did not leave room for any remedy; or, at least; not for this.

Add other circumstances of this kind, in as great a number as you please; so that they do not impeach the science, or the veracity, of those persons, to whom, however, it was not sufficient, in this affair, to differ from their ancestors, without endeavouring, at the same time, to convict them of the vanity of mountebanks: and I could wish this were not too much the custom at present.

16. The mention, just now made, of that noble senator, brings into my mind a circumstance relative to abscesses. Hippocrates (*q*) has taught us, that, “while pus is forming, pains, and fevers, happen more frequently than “when it is already form'd.” Yet he has, even himself, signified, in the fourth book of the Epidemics (*r*), of this dogma, as he has of what is contain'd in many other aphorisms also, that though it is, for the most part, true, yet not so always: and that, if not where he has said that some mature abscesses, in diseases, are borne easily, and without a fever; for this, Martianus (*s*) contends, is to be understood of those that are already suppurated; and not, as Vallesius (*t*) understands it, of those which are in a state of supuration; at least soon after, where, in the opinion of both these commentators, he says, that, in Leambios, “the shoulder, and the fundament, were “ulcerated without a fever.”

In the case of that senator, also, when I saw the tibia; which had been already swell'd from an œdematous tumour of some standing, and a late slight contusion, that had been follow'd by a very inconsiderable erysipelas, and a small degree of fever; become more and more tumid soon after, though neither the patient, nor I, observ'd any peculiar fever, any rigors, any sense of pain, heat, or pulsation; I, nevertheless, began to suspect, that pus was in the mean while preparing, and not without reason; as the very evident fluctuation of matter, felt under the hands soon after, confirm'd.

Does it, therefore, happen in old men, or even in limbs affected with

(*q*) S. 2. Aph. 47.

(*r*) N. 22. apud Marinell.

(*s*) Annot. ad hunc locum.

(*t*) Comm. ad eund. locum qui ipsi est n. 95.

œdematous tumours, that pus is form'd without any marks of its being form'd, or with fewer, and more slight, symptoms? Both of these circumstances I have heard several times from experienc'd surgeons: and when I consult reason, I see that both of them may be conceiv'd; but the second still more than the first. For all old men have not very lax fibres, and sluggish and inert humours.

In the archdeacon, therefore, of whom I spoke above (*u*), pus was not form'd without pains: and in that very senator we are speaking of, it happen'd that, at the same time the former abscess was open'd, another, much less, began at the lower part of the thigh, where there was no œdematous tumour; and we observ'd the symptoms that generally are observ'd to attend the formation of pus.

Yet that pus may be sometimes generated without a fever, even in those who are robust, and at a flourishing time of life; and that in parts which were not affected with œdematous tumours; appears from the observations of others, and in particular from those of my celebrated friend and colleague Pujati (*x*), who, like Hippocrates, in the case of Leambios, saw abscesses brought on without a fever; at first, indeed, in an old woman, but afterwards in a young woman also: and lest you should say that this young woman had her humours in a very inert state, as, some months after, she died of a dropical disorder; he saw the same also in a robust man.

17. Now, then, let us also touch slightly upon some things which relate to the caries, that frequently lies conceal'd beneath abscesses and ulcers. You have, in the beginning of the fourteenth letter (*y*), observations relating to a caries of this kind. But this particularly lies conceal'd in that kind of disease, to which the Arabians have given the name of *Ventofitas Spinæ*: although there does not always appear a very evident caries, but only a tumour and softness of the bones; as in the two that Mauchart (*z*) examin'd after death.

Therefore, as it is equally proper to speak of this disease, even upon tumours as upon ulcers; I, for that reason, in the fiftieth letter (*a*), when, in treating of tumours, mention was made of certain exostoses; took some notice of caries, and its origin. But you will also find, in the *Sepulchretum*, in both places, some things relative to the same disease, most of which were observ'd at Padua; that is, in the second section (*b*), which, in this fourth book, is entitl'd *De Tumoribus*, and in this fourth section, which is intitl'd *De Ulceribus* (*c*).

Yet in neither place is Pandolphinus, who publish'd a treatise of the "ventosity," spoken of; nor Merclinus, who increas'd it with so many annotations and observations: nor is any thing added from Schelhammer (*d*), who treats of the disorder briefly indeed, but with learning and skill; producing observations also (*e*), some of which I do not see in the *Sepulchretum*,

(*u*) N. 14.

(*x*) Dec. Obs. 7. n. 3.

(*y*) N. 3. & seqq.

(*z*) Eph. N. C. Cent. 9. Obs. 33. & 34.

(*a*) N. 57. 59.

(*b*) Obs. 20. & in Addit. Obs. 10.

(*c*) Obs. 5. § 1. &c.

(*d*) De hum. corp. Tumorib. S. 2. P. 1. n. 94. & seqq.

(*e*) N. 98, 99.

and among these even his own : which, at that time, excellently well defended Van Horne (*f*), who differ'd from Tulpius (*g*), against the answer of Merclinus(*h*), who contends(*i*) that Corn. Celsus (*k*), in the passage which Tulpius refer'd to, had meant by the word *cancer* of the bone, a disorder very similar to the *ventositas spinæ*.

And, certainly, the reading of that passage shews, that the word *cancer* is not said of bone, as Schelhammer rightly asserts ; which I do not so much wonder that Tulpius and Merclinus had not seen, as that they should have seen what is not in this place ; I mean, the term *cancer of the bone*. For he says, and even repeats it over and over again, that Celsus does not call this disorder simply a *cancer*, but *a cancer of the bone* ; so that he does not seem to have inspected this passage of Celsus.

18. But the question here is of names : surgeons, however, are sometimes deceiv'd in the thing itself ; and those, even such as are pretty far advanc'd in life, and very much experienc'd ; that is, they are deceiv'd in judging of the caries, which lies open neither to the eyes nor to the probe. It is true, indeed, that it is an indication of a caries, if the matter which proceeds from an ulcer is brown, or somewhat black.

Yet if the matter discharg'd be not ting'd with such a colour, we must not immediately deny that there is a caries beneath. For if this caries occupy a small part of a bone which is not thick, and it lie under a considerable quantity of flesh, which is hollow'd out by large ulcerous sinusses ; even this one simple circumstance may be the reason, why the matter discharg'd from the orifice of the ulcer is not of a brown colour ; in consequence of the very little matter which flows from the bone, being mix'd and diluted with that which flows from the flesh in considerable quantity, and the brown colour thereof being hid.

And this I know, for a certainty, to have happen'd in a young Venetian matron, in the year 1736 ; who having had a large abscess form'd in one side of the buttock, and not having it open'd till late, had been already treated with a great number of remedies, both internal and external, for a long time together, ; but to no effect. The surgeons were, therefore, long deceiv'd by the colour of the pus not being brown, and thereby prevented from suspecting a caries ; till at length they observ'd the probe to pass very easily through that part of the corresponding os ilium, which, about the middle of it, particularly in women, and those that are pretty young, is transparent, by reason of its thinness, and which, in this patient, was already eroded by a caries : so that the probe pass'd on quite into the cavity of the belly.

Nor do I doubt, but as the thinness of that bony part in this very worthy matron, who deserv'd a more happy lot, afforded a very easy passage for the pus into the cavity of the belly, so that in others who have wounds inflicted upon them with sharp instruments at that place, it admits the point of a sword, or any similar instrument, to injure the intestines without difficulty.

On the other hand, it frequently happens that, by examining the colour

(*f*) Microtechn. S. 2. P. 1. § 33.

(*g*) Obs. Medic. l. 4. c. 13.

(*h*) Ad Pandolphin. c. 7. Annot. 1.

(*i*) P. 1. cit. n. 100.

(*k*) De Medicina, l. 8. c. 10. Edit. Alme-

loven. p. 532. l. 15. & seqq.

of the probe, which they have made use of in the examination of ulcers many surgeons do not hesitate to pronounce the case bad; not attending, I suppose, to this circumstance, that it is said by Hippocrates (*l*), “those who have the probe colour’d from the pus, as if from fire, the greatest part (not all) of them die;” nor yet observing, that the question is here of empyematic patients, and not of any colour of the probe, but of that which, instead of suffering this instrument to retain its “white and silver hue, causes it to be extracted with the appearance of lead, and as if burnt by the fire, which is a proof of the great acrimony and corrosive nature of the pus,” to use the words of that very excellent interpreter Duretus (*m*).

Finally, among the other species of caries, that species would not only be worthy of peculiar mention, but very worthy of examination, under which, after having corroded the cranium, “appear’d to the eye” of Slevogtius (*n*), “by the help of glasses, a congeries of innumerable small worms, entangl’d in a viscid humour; many of which, upon being thrown into warm water, gave tokens of their being alive, by their motion.” But as the observator himself, who saw these appearances in the dead body, and might also have observ’d some things relative thereto in the living patient, has deferr’d the *ætiology of this verminous caries* to another time (*o*); you will be less surpriz’d if we do not take upon us to make any conjectures thereupon.

19. But now let us subjoin those things that belong to the second of the two heads propos’d (*p*); that is, to ulcerated tumours and gangrenes.

Besides the observations that have been already sent to you, relating to those tumours, this one remains; which was made by our Mediavia, in the latter end of September, in the year 1739.

20. A young man had an ulcerated tumour in one side of his neck. As it seem’d proper, to the surgeon, that something in this ulcer should be consum’d, by the help of that arcanum which Philip Massieri was wont to call the *pulvis corrosivus magistralis*, and he us’d to apply with great success, but at the same time with great caution; both the fever and pain of the head, which existed before, were so increas’d by the application, that neither in consequence of repeated losses of blood, in which a polypous crust was not wanting, nor yet by diluents, and other remedies that were given and applied, did they give way or decrease. For although the pain in the ulcer itself was diminish’d; yet in the forehead, where it was more severe, it never remitted. The patient, therefore, died delirious and convuls’d.

The tumour had not at all injur’d the subjected muscle. This was what they call *levator scapulæ*, and in that part which lies immediately under the common integuments. The jugular glands of that side were tumid and hard.

The vessels of the brain were all distended with blood: the medullary substance was distinguish’d with bloody points wherever you cut into it, and much softer also than it ought naturally to be; whereas the cortical substance was in a natural state. In the lateral ventricles was a great quantity of limpid water.

(*l*) Coac. Prænot. apud Duret. l. 2. c. 16.
n. 48.

(*m*) Ad eum locum.

(*n*) Dissert. de Carie Cran. in Historiæ sine.

(*o*) § 26.

(*p*) N. 14.

21. Although how much danger there is in attempting to destroy, by escharotic medicines, fungous flesh, that grows up in ulcers, in the extreme parts of the body, appears in particular from the observation of that faithful writer Benevoli (q); yet the use of those kinds of remedies, to the same purpose, even in other places, is not without danger, where the habit is deprav'd: as, from the fever join'd with a pain in the head, in the young man in question, it appears to have been.

But let us go, from this ulcerated tumour, to that disease which is class'd among tumours, by the writers of surgical institutions, and is at the same time join'd with a great corruption of the parts; I mean to a gangrene: and I shall begin with some observations of Valsalva.

22. A young man, of two-and-twenty years of age; of a moderate stature and of a tolerable good habit of body, though of a pale and yellowish colour; falling from a high building, upon a very sharp stone, broke the neck of the os femoris; and, at the same time, was wounded in that part by the stone. Being receiv'd into the hospital of St. Mary de Morte, and treated there in a proper manner, he not only complain'd of a weight in his chest, join'd with a difficulty of breathing; although he spat nothing bloody, and had no contusion on the external parts of his thorax, that could come under the notice of the senses; but moreover, on the fourth day began to be delirious, and to complain of a pain in the wound, and of certain convulsive motions in that part.

On the following night, the same part was seiz'd with a very violent gangrene; which had so increas'd, about the fourteenth hour of the next day, as to extend itself, from the boundaries of the abdomen opposite to the wound, to the whole foot. The cuticle of the femur was rais'd up in many places, just as if medicines of the blistering kind had been applied: and these vesicles were fill'd with a serous humour, which had eroded the skin in many places, by its acrimony; so that a great quantity of water was discharg'd. In this manner the patient died on the fifth day.

The body was, a few hours after death, ting'd with the greatest blackness; as if it had been affected with an universal gangrene: and it swell'd soon after to such a degree, as to seem three times thicker than it naturally is.

23. I did not think this history ought to be pass'd over; as it shows an exceedingly deprav'd disposition of the humours, and a very speedy progress of the gangrene; although Valsalva has not given the dissection: which, I suppose to have happen'd, because it was not in his power to perform it.

For it appears, that if it had been in his power, he would not have omitted it; not only from other circumstances, which I have related in his life, but particularly, from that which, if he himself had not added it here, I should not very easily have believ'd. The serum which gives rise to a gangrene is so acrid, says he, that when I tasted it, at another time, I not only perceiv'd the greatest acrimony, but it also irritated the papillæ of the tongue almost for a whole day. See how far the desire of knowing, and making experiments, has carried some men!

However, you have an instance of a universal gangrene in Tulpius (r); but in an old man, whose strength had been pull'd down for a long time past. You will also have one in Warren (s), but in a yellow fever, which was a species of the plague. Yet the internal cause of gangrenes does not always consist in the sole depravity of the humours. For they sometimes seize upon the legs, because the great artery is compress'd by a scirrhus tumour in the belly (t): to which cause that observation of Hildanus, which you will read in this fourth section of the Sepulchretum (u), relates; although in that, not only the aorta, but the neighbouring vena cava also, was compress'd; for this easily happens in trunks that are so near to each other.

Yet it does not follow, on the other hand, that whatever can sufficiently compress any vein, is equally sufficient to compress a neighbouring artery; so that the conjecture of the celebrated Van Swieten (x), is equally agreeable to probability, and reason, where he accounts for the tumour, and threatening gangrene, of the left foot, from the stricture of the iliac vein on that side; which vessel, and which only, was press'd upon by the extremity of the intestine colon, that was very much distended with flatus.

And the influx of blood into the limbs is prevented, or diminish'd, by such things as press upon the artery, by lying thereupon; and moreover, by still other causes: among which is the very rare case, of gangrene, in the fleshy coat of the artery itself, although the parts that lie round about are sound; as in the case publish'd at Hall, in the year 1742, entitled, "Of the amputation of a thigh, without any effusion of blood." That cause is less rare, which produces the same effect in amputation; I mean the degeneracy of the coats of the artery into a bony nature, which not only takes away their flexibility, but streightens the passage of the blood. Kulmus (y), therefore, judg'd it to be from this cause, that "those in particular who are advanc'd in age, are sometimes seiz'd with a gangrene of the foot, without any external cause having preceded." And, without doubt, it was from this cause in a noble old man, whose history you will find in the works of the illustrious Van Swieten (z).

24. Moreover, there is a certain species of gangrene, and even of sphacelus, which very rarely occurs among the natives of this country, so that it had never yet been seen by Valsalva, when he related to me, at that time a young man, from the report of others, a case of an exsiccation beginning from the great toe, and being gradually produc'd quite to the femur; so that the foot and the whole leg were dry, and without any disagreeable smell, as in a mummy: and that this had brought on death, in a certain woman, some years before.

But he saw the case afterwards, and I with him, before I left Bologna,

(r) Obs. Medic. 1. 3. c. 46.

(s) Vid. Haller in Addend. ad pag. 662. B. suar. Accession. ad Boerh. Meth. Stud. Medic.

(t) Vid. Acta Erud. Lips. A. 1693. M. Nov. in Relat. Chirurg. Barbet.

(u) Obs. 10. § 2.

(x) Comment. in Boerh. Aphor. 422. ad

(y) Disput. de Tend. Achill. disrupto &c. in ipso fine.

(z) Comment. cit. § 424.

in the hospital of incurables. And indeed, among his *consilia*, I have read one which was written for a monk that labour'd under a disease of this kind. This man was more than forty years of age, of a full habit, and had his fluids inclining to a scorbutic dyscrasy; besides that, he had been before subject to tetter, and the gout; and also, even then, and for a long time past, to frequent suppurations of one of his great toes, from whence that part had always retain'd a brown colour, till it began to be seiz'd with an exsiccation, which was very slowly propagated through the whole of that toe, and, afterwards, through the whole of the next toe, in like manner.

And this toe, like the great toe; which they had amputated in vain; had always remain'd wither'd, and dry, from the time it had been seiz'd with this disease; except that lately, about the extensor tendon of that toe, some signs of incipient pus had been observ'd. And although, for the most part, there seem'd to be some obscure inflammation in the metatarsus; yet this was without any traces of a stagnating humour, and attended with moderate pain. A fever also had, more than once, come on, which had its exacerbation about the evening; but without any previous horror, and without any very violent symptom to attend it.

These circumstances I was willing to describe to you accurately, that you may compare them, presently, with those examples which I have since read in authors, or have been since propos'd to me. These cases have been very frequent in some of the provinces of France, as well as in other places. And not only about the year 1710, was this dry gangrene remark'd, but also about the year 1676, as is said in the History of that Royal Academy of Sciences (*a*): and even in the year 1706, as you may see taken notice of, at large, by Rudolphus Jacobus Camerarius (*b*); and again in the year 1747, as you will find by turning over the Memoirs of the Academy (*c*), last spoken of.

And there the fault is always laid to the vitiated grains of rye, in consequence of being left by the poor people, in preparing their flour, together with the sound and good grain, in a time of scarcity; for none but these poor people were seiz'd with this disease: and the unsound grain was accus'd, on another occasion, by Brunnerus (*d*), that is to say, when the inhabitants of the Black Forest were troubled with the same disease. Yet I should not believe, that this grain could have had so much effect, without a certain disposition of body previous thereto; or, at least, at the time when males only, and not females, if you except a few little girls, were attack'd with the same kind of gangrene, in the same villages.

However, at other times it, for the most part, affected both sexes indiscriminately: and somewhat differently at different times; so that it occupied other limbs, and other parts also, but in general began in the toes: the other differences you will see, of yourself, by examining the books, and the authors, that I have nam'd. For I return to those cases, wherein the grain could not be accus'd.

(*a*) A. 1710. Botanique.

(*b*) Eph. N. C. Cent. 6. Obs. 82.

(*c*) A. 1748.

(*d*) Eph. cit. Dec. 3. A. 2. Obs. 224.

Indeed Benivenius (*e*), where he fpeaks of the unhappy event of gangrenes, that begin from the toe, efpecially in old men, feems to hint fomething that relates to this fubject, when he fays, “ that the flefh begins, by “ degrees, to grow black, or to become livid : and, indeed, fometimes to “ grow dry, and wither’d, at the fame time.”

But Hildanus more certainly, and openly (*f*); in a man of feventy years of age, who had been fubject to the gout ; describes a gangrene which crept upwards, by degrees, from the toes, (after an uneasy fenfation of cold, and a ftupor) in fuch a manner, that the foot and leg became black, like charcoal, and cold, immoderately dry, and extenuated ; but without any pain at any time : the pulfe being but little chang’d, and the appetite for food fcarcely diminifh’d.

The fame author produces an obfervation of Smetius (*g*), that is to fay, an obfervation of a woman’s foot being feiz’d with a fphacelus of this kind ; fo that becoming wither’d, dry, and black, it resembld an ox’s tongue, harden’d with fmoke. And to this fubject belongs, in part, what Barbette (*b*) fays of the fcorbutic gangrene ; I mean that it generally takes its beginning from the toe ; that it degenerates into a dry cruft ; has no bad finell ; and fometimes no pain.

Now attend to a cafe that was defcrib’d to me by letter, when Matthew Tornieri, who was, when living, an eminent phyfician at Vicenza, confulted me in the latter end of February, in the year 1720, for a noble count.

25. This nobleman, being of a flender habit, but an excellent colour, was as yet brisk, healthy, and robuft, when he completed his four-score-and-fourth year ; having been never feiz’d with any diforder that was worthy of remark, during the courfe of fo long a life. About the latter end of January he was feiz’d with an unusual fenfe of coldnefs : and three days after, with fo great a coldnefs, that he was oblig’d to go to bed ; and was there, nevertheless, cold for fome hours : till, by the frequent application of warm clothes, the other parts of the body, at length, grew warm ; but all the toes of the left foot, and the metatarfus, remain’d very cold, felt nothing, and were but juft bent by the force of the flexor mufcles ; the flefh of which, you know, does not lie on the toes themfelves : and what was much worfe, the following day, a fomewhat livid colour was obferv’d to be now proceeding from the great toe, into the metatarfus.

Remedies were given internally, and applied externally, to obviate this diforder. But although the lividnefs in the metatarfus, and the coldnefs, feem’d to be fomewhat lefs ; yet, about the end of February, the extremities of the toes were already cover’d with a black fkin, which was, at the fame time, dry, and hard like a mummy : nor were the beginnings of a future difeafe wanting in the metatarfus, the fkin being already black, in two places, on the back of it, and even in one of thofe places already hard.

It was alfo fomewhat hard at the tarfus, in one certain place, where it was

(*e*) De abditis nonnullis &c, morbor. caufis
c. 71.

(*f*) Cent. 4. Obf. Chir. 92

(*g*) de Gangr. & Sphacel. c. 7. in fin.

(*b*) Chirurg. P. 2. l. 1. c. 14.

black. And the tarsus itself was, last of all, become somewhat tumid; and, if you press'd it with the finger, preserv'd the marks of the pressure, and was in pain. And indeed a small and white vesicle had rais'd itself up under the sole of the foot; which vesicle contain'd but a very small quantity of water. At the ankle was almost the same tumour as in the tarsus. The other part of the leg was rather somewhat wasted and thin.

Under these symptoms the patient preserv'd his usual alacrity, the usual strength of his pulse, and the vigour of his appetite; although the fever, which was slight indeed, continued constantly nevertheless, from the seventh day of the disease, when it had first begun; so that he ate his food very freely, especially for a man who had never been us'd to eat much; and this was allow'd him not only in considerable quantity, but of a pretty solid consistence; in order to preserve his strength.

After having read this account, and perceiv'd that no other hope remain'd, except that the patient's life might be prolong'd for a considerable time, I immediately wrote back an answer to that effect: but there is no need to tell the whole of it here. For I discours'd, pretty much at large, upon the remedies which had been made use of, and of such as might, in my opinion, be added, with that ingenuoussness which is requisite, and which I have always made use of on these occasions. When I had signified what I disapprov'd, or what I was suspicious of; I expressly recommended, among other things, with Hildanus (*i*), the juice of earth-worms, prepar'd in the manner that Wierus us'd to prepare it, to be applied externally to the part yet sound, in order to prevent the progress of the exsiccation.

Yet I did not forbear to mention, that, unless the season of the year forbade exposing the patient's foot frequently to the cold air, it might also be consider'd, whether that method which had succeeded so well, for the same purpose, with that physician at the Hague, Samuel Cabliau (*k*), was not worthy of imitation in this case: for he, having order'd the foot, and leg, which was almost wholly dead with a sphacelus, to be “continually touch'd, “or, as it were, painted, with a pretty large pencil, or brush, dip'd in the “best spirit of turpentine;” brought about, that the leg should adhere to the part that was yet sound, and the sphacelus not proceed upwards; the sphacelated part being “torrid, and dry, and almost like an ægyptian mummy:” and by these means he preserv'd, for nearly six months together, an old woman of almost ninety-two years of age.

The other things which I had approv'd, or added, being done; the patient, if he did not live so long as this woman, at least, liv'd much longer than those who were present had shown any expectations, or hopes of. For, about the later end of May, I was again consulted by letters, in which Tournieri related, that the patient was still full of spirits, as before; his pulse not being weak, and his natural rosy colour almost the same; that his appetite as good; he had no thirst; he discharg'd his urine in a proper quantity; which was of a colour and consistence that was natural; but that he did not

(*i*) l. *supra* ad n. 24. cit. c. 13.

(*k*) Eph. N. C. Dec. 3. A. 5. & 6. Obf.

discharge the harden'd intestinal fœces, more than once in five or six days, as he us'd to do in health.

And as to the disorder itself, he said that it had made some progress within those three months, but so slowly and gradually, that about fifty days had pass'd before the toes, and the metatarsus, and the tarsus, quite to the ankle-bones, were become black, hard, and perfectly similar to a mummy.

But after that, when the black and hard skin had rais'd itself up near the ankles, an ulcer was discover'd to be under it, when taken away by the forceps: and this ulcer was, at the time of writing, of the breadth of a man's hand, of a lively red colour at its upper circumference, and not without pain at the time of dressing; but that the external ankle, and a part of the tibia, were black: at the lower circumference of the ulcer the flesh was soft and putrid, and somewhat stinking; and when this was taken away by degrees, as they attempted to do, and as it was in that place where the dryness and hardness of the tarsus ended, they should see, he said, whether there was any thing putrid beneath: or whether all the soft parts of the tarsus had been really converted into a mummy, as they seem'd to have been.

As to what related to the leg, he said that anteriorly it was in a natural state; but that the calf was somewhat tumid: that when the leg was compress'd, a drop of pus was press'd down into the ulcer; which pus was sometimes of a white colour, and sometimes ting'd with red: yet that the limb preserv'd the natural warmth and colour of its skin. That the pus of the ulcer was variegated: and that to the part of it which was putrid, such things were applied as are enemies to putrefaction; but that when it was of a lively red, the juice of earth-worms was applied, as they also found it, by experience, to be of advantage in this part.

As to what remains, he said that this slow fever never had gone off; but was sometimes even increas'd: that some nights were pass'd in a very restless manner, on account of the itching on the surface of the body, and sometimes from spasmodic motions of the sound leg: finally, although the skin was even then soft, the patient was nevertheless reduc'd to the last state of leanness.

I was displeas'd with this last circumstance in particular, as well as many others, because it very greatly diminish'd my hope of protracting life for a very long time. Yet that I might not be wanting to this noble old man, and to his very benevolent physician, both of whom ascrib'd more merit to what I had written before, than I could by any means acknowledge; when I sent my answer to the letter, I recommended such things in particular, as were suitable against the other symptoms; but particularly against the emaciated state of body.

I therefore recommended, of the two remedies which are the most powerful at that time of the year, I mean the viper and milk; to try which they should prefer: adding this also, in regard to milk, that if they thought I had propos'd any thing useful from Hildanus, in my former opinion, they should also take this from the same author (*l*); who recommends, against that very same species of disorder, not only "womens milk," but, "if this

(*l*) c. 13. cit.

“cannot be got, the milk of asses :” from which, if it should be borne well, there would be a natural transition to that of cows. Which of these remedies they prefer’d I do not know : this however I know, that the life of the patient could not be prolong’d to the beginning of the summer.

26. Thus you have at large, as it is of a disease not very frequent among us, what was written to me, and what I answered thereto. But whether in this species of gangrene also, there was room to propose, internally, the Peruvian bark, and externally, warm water, I should perhaps have consider’d, if the observations upon the former had been then extant ; although it answered differently at different times ; I mean the observations made by many very ingenious men, but particularly those so often repeated at Bologna, by the very skilful and experienc’d academics (*m*) : and if the custom of the celebrated Benevoli, in regard to warm water, had been known ; particularly from that observation (*n*) wherein he, by these means, overcame gangrenes, which not only produc’d a black but a hard skin also.

And as to what relates to the Peruvian bark, although I know that it is commended by the celebrated surgeon Guiffard (*o*), in a dry gangrene ; yet, on the other hand, I know that its efficacy has been call’d in question by another (*p*) : however, as among several things which have, at different times, shown the utility of the Peruvian bark against other gangrenes, that experiment seems principally to deserve attention, wherein every thing became better while the bark was taken, but worse while it was omitted ; and finally, better again while it was again made use of : so I should believe that there is no inconsiderable weight in a similar observation, which is extant in the history of the Royal Academy of Sciences at Paris (*q*), in order to compute the same utility in a dry gangrene : for a dry gangrene, which had begun in the foot, was alternately better and worse, according to the alternate exhibition and intermission of the bark ; till at length it was quite overcome by the use thereof, without any farther interruption.

Nevertheless, you see it is here to be wish’d that the experiment were often repeated, and not only in an incipient gangrene, but where it was already perfect : and you also see, to go on to external remedies, that there is no room for the method of Benevoli, when it is determin’d not to remove what is hard, but to make it still more dry and hard, that the patient may be preserv’d the longer : to which purpose such things ought to be applied, as may preserve the dead part, in the same manner that an embalm’d carcase is preserv’d.

On the other hand, we must see to it, with the utmost caution, that we do not easily descend to the use of such applications as excite a generation of pus ; bearing in mind those physicians, who, hoping to separate, by suppuration, that part of the great toe which was dead, from the living, caus’d the gangrene which Boerhaave (*r*) had put a stop to, in that part, for six months, to spread quite up to the thigh in the space of three days.

(*m*) Comment. de Bonon. Sc. Acad. Tom. 2. P. 1. inter Medica.

(*n*) 16.

(*o*) Vid. apud Haller. in Access. ad Boerh. Meth. Stud. Med. P. 13. c. 4.

(*p*) Vid. Act. Erud. Lips. A. 1751. M. Jul.

(*q*) A. 1743.

(*r*) Vid. apud Swieten. in Comment. ad illius Aphor. §. 424.

And, indeed, although there was already a kindly suppuration in a very similar case, yet the celebrated Dieter. Sproegelius (*s*) relates that the patient could not be sav'd; and admonishes us, that, in disorders of this kind, we must not very readily trust to suppurations; not even those that have been wish'd for, and have succeeded according to our desire. Which circumstance, of itself, might check the hopes of those who would recommend the amputation of the dead member, in gangrenes of this kind, in old persons.

But other circumstances are also to be taken into the account; as, for instance, if, as Kulmus (*t*) suppos'd, and as it certainly sometimes happens, the gangrene had its origin from the arteries being become bony, and consequently streighten'd, higher up: or if, in the blood, as very frequently is the case, there was an insuperable cause of gangrene, from whence it happens, for the most part, that the same disorder will attack the remaining part, either of the same limb, or of another, soon after the separation has been made; whether this has been done by means of amputation by the surgeon, as in the observations of Hildanus (*u*), Tulpius (*x*), and others, or by means of nature itself, as you may see in the examples of gangrene from the vitiated grains of rye, which we have referr'd to above (*y*).

These reasons therefore, besides a decrepid age, did not permit me to think of amputating the foot in the patient describ'd by me. But even if this extreme kind of remedy could have been borne by a very old man, and the same disorder had return'd to no other part soon after, yet it would have been attended with this difficulty, that the patient would perhaps have been carried off soon after by some new disease; that is, by one of these to which this extreme old age is subject.

For to use the example of one disease only, and one therefore that relates to the subject of this letter, among my auditors of long-standing is a physician who saw three old men here, and that not long since; one of whom was seiz'd with an ulcer of the calcaneum, and the others with a gangrene of that part; happily and perfectly cur'd: yet in each of them the cure was succeeded by a discharge of sandy particles in the urine; which discharge was succeeded by an inflammation of the bladder, and this inflammation by death.

Wherefore, although in the more firm and robust times of life, there is room for heroical cures, as they are call'd; for to the danger is oppos'd the hope of a long and happy life; yet in extreme old age, as there is scarcely any hope to be oppos'd to the very great danger, and men far advanc'd in life, though cur'd by a safe and mild method, nevertheless die soon after; it does not seem that we should rashly recede from this second method of cure in like cases. Farewell.

(*s*) Obf. Select. §. 37.

(*t*) Vid. supra, n. 23.

(*u*) Cent. 4. Obf. 92.

(*x*) Obf. Med. l. 3. c. 47.

(*y*) n. 24.

LETTER the FIFTY-SIXTH

Treats of Fractures and Luxations of the Bones, and of other Diseases that are injurious to Motion.

I. **A**LTHOUGH the Sepulchretum divides the disorders, at present to be treated of, into the two next sections, that is; the fifth and sixth; yet these are so short, that the observations and scholia of both of the sections are contain'd in two leaves: nor would they fill up this space, if some things that had been already said were not repeated: and this you will find to be done in the very beginning of the fifth section, if you compare the first article of the first observation, and the two first heads of the scholium subjoin'd thereto, with the third article of the fifteenth observation in the second section, and with the scholium that is tack'd to this article. It is my pleasure, however, as I am determin'd not to repeat over again what has been said already of fractur'd bones, when treating of wounds and blows, to comprize every thing that remains in the papers of Valsalva, or in mine, in relation to the disorders in question, in this one letter; beginning with that bone upon which our observations have been chiefly exercis'd, as we enquir'd whether it was broken or luxated. Which circumstance obliges us to speak promiscuously, and not separately, of both kinds of disease.

2. The ancients did not doubt but the head of the femur might, like the heads of other bones, be dislodg'd from its situation; and this so much the less, because, although they knew that the replacing of it, when fallen out, was difficult, and the preserving of it in its place still more so, yet they were not ignorant, from the testimony of Hippocrates, Diocles, Philotimus, Nileus, and Heraclides Tarentinus, that both of them had, sometimes, been exceedingly well brought about.

For these "very celebrated authors have transmitted down in their writings," as Celsus (*a*) says, "that they had wholly restor'd them;" and this Heraclides, indeed, more than once; as appears from that passage of his which is preserv'd to us by Galen (*b*), who has affirm'd that he himself, also, "had already cur'd a luxation of the femur twice, in such a manner, "that it did not fall out for the time to come:" and the same author has

(*a*) De Medic. l. 8. c. 20.

(*b*) In Hippocr. de Artic. Comment. l. 4. n. 42.

affirm'd, that, after Heraclides, " many other more modern practitioners " had done the same.

But as to what had been remark'd by Heraclides and Galen, that this attempt succeeded when the ligamentum teres, as it is call'd, is relax'd, and not ruptur'd; that is, the ligament whereby the femur is join'd with the acetabulum, and for this reason; because by medicines it may be brought about, that, the laxating humour being consum'd, the relax'd ligament may again be contracted, but not that the ruptur'd ligament may again coalesce: though physicians are, in part, taught the truth thereby, yet they are, in part, drawn away still more and more from the knowledge of the truth.

For it is true that, when this ligament is relax'd, the head of the femur falls out of the acetabulum; but it is not equally true, that the same head often falls out of its acetabulum, because that ligament is ruptur'd. Therefore, although the luxation of the femur from an internal cause, that is, one whereby the ligament may be relax'd, cannot be denied; yet the luxation of this bone from an external cause, that is to say, from a violence which ruptures the ligament, ought not so easily to have been plac'd amongst the most frequent luxations.

Nor would it have been plac'd there, if the difficulty, on the one hand, in breaking through a very strong ligament, and, on the other hand, the difficulty in pulling away the head of the thigh from its cervix, or in breaking the cervix, had been compar'd one with another. For it would have been perceiv'd, that the force, whereby this ligament can be broken, could much sooner pull away this head from its cervix, or break the cervix; and that, by these means, unless some bodies (*c*) have any thing peculiar in this part, the femur would fall out of its situation, by reason of the head being pull'd away, or by reason of the fracture in the cervix, and not in consequence of a luxation.

But these things, and others of a similar nature, did but just begin to be taken notice of at length, when dissection perform'd on dead bodies very evidently shew'd, that what was suppos'd to be a luxation of the head of the femur, from an external cause, was, in fact, almost always either a separation of the head, or a fracture of the neck.

Nor was it immediately consider'd what were the causes of this circumstance, from the time in which Parey ingenuously confess'd (*d*), that it had sometimes happen'd to cautious surgeons, that they had taken the separation of the head of the femur; and even to himself, in the case of a matron, that he had taken the fracture of the neck; for a luxation. But Parey had been deceiv'd by the great trochanter of the femur, which he, touching above the ischion, had suppos'd to be the head of the bone; till on the day after, while he was again endeavouring to force the bone into the acetabulum, he was warn'd of a fracture, by hearing the collision of the broken bones against each other: and was the first of all, as far as I know, who discover'd this fallacy in the thigh-bone; which is the more considerable, as, by reason of the commonness and similitude of the signs, it happens the more easily.

(*c*) Vid. *infra*, n. 5. in fine.

(*d*) Oper. l. 14. c. 21.

For our Columbus (*e*) had, in general, hinted at it, (but in children only) when, after having taught, that “if we boil the bones of a kid, or a lamb, “or any other animal, lately born, we shall see certain parts in their extremities,” that is, the appendices, or epiphyses, “to be pull’d away and fall off;” he then, after many things being interpos’d, admonish’d us, that if “the tender bones of children are very roughly handl’d by an unskilful physician, the ligaments are extended so far as to pull off the appendages “with them.”

And you will readily perceive that divulsion, and fracture, as far as relates to the present discourse, come to the same thing; and may, for that reason, be promiscuously consider’d by me; when you observe that whether the head of the femur be pull’d away from the cervix, or the cervix from the femur, these things can certainly not happen in adult bodies without a fracture: no more than if the very cervix itself be broken in the middle.

Nor yet will you think it of any very great importance, not to separate a divulsion from a fracture, if you attend to the effect and the signs of the case; unless you suppose that the sign which is taken from the sound of the bones, when mov’d upon one another, is more evident in the latter, and less evident in the former: although in children a divulsion generally happens, and not a fracture; nor is there so much importance in that sign when it is absent, as when it is present.

For the extremities of the broken cervix rarely correspond with each other; nor is it always in the power of the surgeon to move one against the other, so as to make a collision: nor can the sound, which is generally slight and obscure, be always sufficiently heard: for which reason it happens sometimes that it cannot be heard till the following day, as I have said of Parey, and even that it cannot be heard till after many days, when the inflammation is at length discuss’d.

3. I have said above, that from the time wherein Parey had discover’d the case, the causes of it were not immediately enquir’d into; but that dissections, which might shew this circumstance more evidently, were waited for. And they must have been waited for much longer, if they were first perform’d by Du Verney, as some are of opinion, or by Ruysch, as is the opinion of others; or even if they were first perform’d by Rolinc.

But, indeed, Rolinc (*f*) has hinted who had done this thirty years before himself; I mean, Caspar Hoffmann; who, having publish’d his Commentaries on the books of Galen *De Ufu Partium*, and having admonish’d (*g*), “that “what is thought to be a luxation, sometimes happens to be a fracture, “that is to say, when the femur is broken even in the upper part of it, “where the appendix is, or in the neck itself,” says, “The former Columbus admonishes of all appendages, book the first, chapter the second; “the latter I have seen in the thigh of a cat:” and he has subjoin’d his observation of the cat, which was suppos’d to have suffer’d a luxation of the femur, from the time that he had been continually lame, in consequence of having suffer’d some external violence when he was very young, and in which,

(*e*) De Re Anat. l. 1. c. 2.

(*f*) Dissert. Anat. l. 2. c. 49.

(*g*) Vid. l. 3. in fin.

when dissected, he nevertheless found the femur not luxated, but the neck of the femur broken; the head of the cervix even then adhering in its acetabulum.

And he has immediately added the reasons why the humerus is easily luxated, and the thigh-bone with difficulty; the first of which is, "because the former is without this round ligament, and the latter has it:" the second is, because the acetabulum of the latter is more confin'd and deeper: and the third, because the joint of the thigh is supplied, and girt around, with firmer muscles. All which reasons are commonly advanc'd at present: although Rolfinc has describ'd the observation of Hoffman, and has omitted them: and this you will find even from the Sepulchretum (*b*), which gives you every thing that Rolfinc has upon this head; except that it, nevertheless, passes by these words, which ought to be interpos'd betwixt the scholium and the observation of Hoffman: "Many times we have here observ'd a great mistake, and the like has been remark'd by Hoffman."

But whether he observ'd it by dissecting dead bodies, or by handling living bodies, as is said of Diemerbroeck in another part of the scholium, you yourself will determine. At least none of these authors has mention'd the remark of Parey, upon that matron, and his admonition in respect thereto. For it is quite another thing that is produc'd from I know not what chapter of Parey, by Rolfinc, who, when he inculcates that this epiphysis is easily separated in infants, and young animals, by the fault of nurles, and from slight causes, as he proves from the boiling of bones, shews that he had rather profited from Columbus, than from Parey.

But Hoffman, in his posthumous work (*i*), has universally confirm'd what he formerly had taught from that observation of the young cat; and determin'd it to be "exceedingly true, that a fracture in the neck of the femur happen'd more frequently than a luxation of the head of the femur, particularly on account of the ligamentum teres, which is in the acetabulum itself:" although in the year 1641, Veslingius (*k*), in writing to him, seem'd to contract the affair in some measure, in considering, for instance, when that happens, not only the strength of the ligament, but also the fragility of the bones, "which in some constitutions is remarkable."

And I thought proper to write these things to you pretty much at large, of those persons who have made mention of the case in question before our time, that it might appear what is to be attributed to every one; either in leading the way to, or in acknowledging, or in demonstrating, or in enquiring into, the causes of the circumstance itself.

From the observations of these authors, perhaps, that more ancient one of Jacobus Sylvius (*l*) does not differ; that is to say, an observation made upon a stone-mason falling from a high place, and breaking his *crus*, or leg, "at the head of the hip-bone;" and what he meant by the word *crus* is not only manifest in other places, but there, in particular, where (*m*) describing the ligamentum teres which I have so often spoken of above, as rising from

(*b*) Sect. hac 6. Obs. 2. cum Schol.

(*i*) Apolog. pro Galeno, l. 2. c. 81.

(*k*) Epist. 25.

(*l*) Observ. post Isagog.

(*m*) Isagog. l. 1. c. 3.

the fundus of the acetabulum, he says, "it is inserted into the head of the " crus."

4. Yet I shall not here, however, point out all the observations of those who have written in our age; and what I do refer to, I shall refer to only in a cursory manner; as well because these are very generally in the hands of all persons, as because the chief of them are extant in the dissertation of Salzmann (*n*), publish'd in the year 1723, in which he has, if any other person has, inform'd us of the causes, on account of which the luxation of the femur is with difficulty distinguish'd from the fracture of its neck: and yet he has shewn, that the latter happens more easily, and consequently more frequently, than the former, from the application of external violence.

Those observations were made upon such persons as were suppos'd to have their lameness from a luxation, and not from a fracture: some belong to Ruysch, some to Cheselden, and others to Erndlius; some observations of Borstius being added, with the approbation of Rau; which first-mention'd observer, having dissected the bodies of eight persons, that had been lame in the same manner, had never found a luxation, but always a fracture of the femur in its neck, as the fore-mention'd authors had done.

But Ruysch, by whose authority, in particular, the case has begun to be confirm'd in our times, has both produc'd the causes of the circumstance (*o*), together with the observations, and in several of them has remark'd somewhat peculiar; I mean, that the fragments of the cervix, which had been formerly broken, and divided into small pieces, not only did not remain behind; but that, sometimes, in the place thereof (*p*), many hard ligaments have been found, of some considerable thickness, and round in their figure; which not passing externally, but internally, connected the head of the femur with the upper part thereof: and, sometimes (*q*), that the head has been found to be conglutinated, and form'd into one substance, with this upper part of the femur.

To which two peculiar remarks there are some things that may be added. To the first, that Salzmannus, in another dissertation (*r*), publish'd five years before that which I have spoken of, had said, that those hard and thick ligaments, which Ruysch had seen betwixt the head and the femur; and which he did not doubt were substituted, by nature, in the room of a cervix; were made up of the periosteum, which being lacerated by a fracture, frequently becomes very hard and thick in that part, and is wont to put on the appearance, and perform the office, of a ligament: an example of which case had already been propos'd in the *Acta Eruditorum Lipsiensia* (*s*), in a certain fracture of the ulna and radius.

But, nevertheless, I would have you attend to this, at least, that those ligaments of Ruysch did not go to the external parietes of the fractur'd bones, as the periosteum generally does where it is, but went to their internal part. To the other peculiar remark, that is, to the observ'd conglutination of the

(*n*) De Luxat. off. femor. &c. c. 4.

(*o*) Thef. Anat. 8. n. 103.

(*p*) Thef. 9. n. 74.

(*q*) Ibid. n. 44.

(*r*) De Articul. Analog. &c. c. 2. § 1. & 4. & c. 3. § 2.

(*s*) A. 1685. M. Nov.

broken bone with its head, which at other times is wont to be found separately in the acetabulum, we must add, that when this conglutination happens; and I have known it happen more than once; it is to be attributed to those bandages, whereby the femur is kept, for a very long time, press'd very closely against the head of the bone; and to the resolution of the patient in keeping himself still, and avoiding all motion.

Yet that old woman was not free from lameness in whom Ruysch found a conglutination of this kind. For although, when the neck of the femur is deficient, the whole of the bone is less oblique outwards, and for that reason the limb less short than it would have been; yet, by these means, the femur is brought nearer the other, and the directions of the muscles that move the thigh and the leg are chang'd.

But even that woman was lame, of whom the question is in the observation of Erndlius, already refer'd to; although the fractur'd cervix itself had coalesc'd, by means of a callus of the breadth of a man's thumb, which was protuberant under the head of the bone; so that the cervix might seem not to be wanting; and no injury appear'd in the ligaments and the neighbouring tendons, nor any state of the parts that was preternatural: so easily does a lameness happen after a fracture. And in proportion as that whole part of the femur, at its superior extremity, wherewith the cervix coheres by its basis, is larger and more firm than the cervix itself, the coalition, of which I have first spoken, is less difficult than this second: the difficulty of which is increas'd by the same circumstance that renders the fracture easy; I mean, by the oblique direction of the neck.

For that impulse which the strait bones of the legs, and the thighs, often suffer without any mischief; as, for instance, in a man who falls from a considerable height upon his feet; the cervix of the femur can scarcely ever bear, by reason of its transverse direction: especially as it is very fragile, and prevented from following the motion of the femur when driven upwards, by the resistance that the head meets with, in its ascent, from the acetabulum, which is immoveable.

And these same causes, when the muscles draw the femur upwards, disjoin and unglue the parts of the broken cervix, which are again contiguous to each other, and beginning to coalesce. And the most ancient authors were not ignorant of this position of the cervix; therefore, Hippocrates (*t*) has expressly said, "that the head and neck of the femur are naturally oblique." And Aristotle (*u*), when he said that the femur was *biceps*, or double-headed, had not the same meaning, that Niphus (*x*) has given to him in his interpretation of the passage, that is to say, "that there is one femur on the right side, and another on the left;" for this he had sufficiently said already; but having in his eye, on the one hand, the large trochanter, and, on the other, the cervix in the upper part of the femur, he has asserted that the bone is double-headed.

Why it is thus divided, and has a neck running almost transversely, is far more manifest than why the neck should have so fragile a structure. For it

(*t*) L. de Articul. n. 63. apud Marinell.
(*u*) De Hist. Animal. l. 1. c. 15.

(*x*) In Expos. ejus loci.

is common to some other bones also, and is not peculiar to this only, as some learned men say, to send out certain parts which make an angle with themselves; as, for instance, the scapulæ, and the lower jaw.

But the parts sent out from these, are of a far more firm structure, if compar'd with the bones from whence they are detach'd, than the neck of the femur when compar'd therewith. Nor is this cervix so much thicker than the bone to which it is added, that we can say equally thereof, as of the extreme parts of the longer bones, that they resist breaking, by their thickness; if not by their structure.

5. But what happens in most persons in whom the cervix is broken, (for on account of the impediments, which I have mention'd, it is very rare that it does coalesce), we shall see presently, when we go on to that other dissertation of Salzmannus, and at the same time point out those observations which he could not relate in the dissertation hitherto spoken of: yet not all; for we know, that many are extant in other authors; but make mention of one or two only, which were in my hands while I was writing on this subject.

That experienc'd, and industrious surgeon, Gregory Barbett, as well as those whom we omit, saw, as you have it in his *Apologia* (y), which he, with great kindness, sent to me; the same thing in a woman, of eighty years of age, that was dissected by him; in whom, although, until the fourteenth day after she had fallen, the injur'd limb had not been shorter than the sound one, the neck of the femur was nevertheless broken: could this be, as he suspects, because it was not quite broken in the beginning; and, therefore, resisted, for so long a time, the muscles which mov'd the femur?

Yet the same author produces another observation, of a man who had been lame for a long time, from a violent kick upon the same joint of the femur. In him he found the femur luxated; so that with its head, it lay contiguous to the back of the os ilium, no traces of the ligamentum teres being left behind: the orbicular ligament being quite disfigur'd, and the acetabulum almost destroy'd.

And Salzmannus himself; who confess'd ingenuously, that neither of the cases, which he treated of with great skill, and separately, in those two separate dissertations, had as yet happen'd to be seen by him in dissection; could, five years after, affirm, that both of them had been met with by him, in the mean time, in such a manner, that in regard to the first, he asserted, “it happen'd to him to find a fracture of the femur, more frequently than a luxation:” and as to the second, that he could produce two examples of luxations of the femur, in one of which, the head of that bone, without a fracture of the neck; and in the other, the cervix (a), broken off from the head, which had been consum'd and destroy'd, “lay against the external part of the os ilium, a little above the acetabulum, and, by attrition, which had subsisted for a long time together, had form'd to itself a certain cavity, and a kind of superficial sinus, from whence both of the subjects,

(y) *Apologia di due Cure.*

(a) *Vid. etiam Act. N. C. Tom. 2. Obs.*

(z) *Vid. in Comment. Imp. Acad. Petro-pol. Tom. 3. Obs. Anat.*

“ notwithstanding the foot on that side was shorter, could walk in some measure; though not with facility, nor expedition.”

Nor indeed does the first of these two examples, nor the observation, which he himself had produc'd in the dissertation (*b*), from the Berlin transactions, nor any other observations of this kind, similar to these which I just now took notice of, in the second place, from Barbett, and which, as he says with justice, are “ not frequent;” run counter to his opinion, which sufficiently appears from the very title of the dissertation itself; “ *De luxatione ossis femoris rariore, frequentiore colli fractura.*”

For as more examples are extant of the latter, than of the former; or, at least, in adults, and from an external cause; so that Ruysch (*c*), affirm'd a luxation to happen “ rarely,” and Rau (*d*), “ very rarely;” some contrary examples will not at all be destructive of the cautious and prudent opinion of Salzmannus; and if there were none of these examples, his opinion, which pronounces the luxation to be “ more rare,” would of course fall to the ground.

And indeed, when he enumerates the causes (*e*), on account of which this sometimes happens; as, for instance, the well known laxity of the ligaments from the gout; the paralysis of the surrounding muscles and tendons; the size of the acetabulum being naturally too large, or the head of the femur being naturally too small; as likewise a fracture in the margin of the acetabulum; or a defect of it; or, in fine, tumours that had arisen within the acetabulum: it is easy for us to conceive, that where any one of these causes is not so considerable, as to be able, of itself, to thrust the head of the femur out of the acetabulum as yet; if any external violence then happen to be applied, it will not be difficult for a luxation to follow: and the same thing may take place in those likewise, who happen to have their ligaments naturally very lax, or in whom the ligamentum teres, (which is a rare observation of Nicolaus (*f*)) is entirely deficient.

6. Now since there are some observations taken notice of, wherein it is shown what has happen'd in those persons, whose femur, when broken, or wholly prolaps'd out of its seat, could not be restor'd thereto; we must subjoin others which relate to the same subject.

And as John Salzmannus, in that dissertation which is referr'd to above, and which is entitled, “ Of analogous articulations that succeed to the fractures of bones;” treats of this subject in general, he has many things which you will be very willing to examine, and transfer hither; but he produces observations, the greatest part of which, not only relate to other bones, but were made in the living body, by the judgment of the touch only, and not taken from dissected bodies, where the eye could judge also: of those therefore, which we principally enquire after here, he has none; unless you choose to consider that of Ruysch, wherein, instead of the cervix, some thick ligaments join'd the head with the upper part of the femur, as relating to the present subject; for those which are from Diemerbroeck, as I have observ'd above (*g*); do not relate to anatomical inspection.

(*b*) c. 2. § 7.

(*c*) Thes. Anat. 8. n. 103. § 2.

(*d*) Vid. Dissert. Salzmann. modo cit. c. 4.

(*e*) Ibid. c. 3. § 5.

(*f*) Dec. illustr. Anat. Obs. 7.

(*g*) n. 3.

But that double observation, on one woman, which I have read in an osteological dissertation (*b*), publish'd under the auspices of the very celebrated Gaubius, and sent by him to me, with great kindness, does relate to this question. Both the thigh-bones had fallen out of the acetabulum. The head of the right femur was found; that of the left entirely consum'd by a caries.

Therefore, as a new acetabulum was seen corresponding to each of those heads, in each of the ossa ilia; the left acetabulum was hollow'd out but slightly, the right very deeply; and the old acetabula were almost obliterated: so that it might be easily suppos'd, that these old sockets, being depriv'd of the heads of the bones, which, by their bulk, pressure, and motion, preserv'd them, had almost lost their cavity: and that those new ones were thus unequally hollow'd out, because the left head being destroy'd, before it could be press'd sufficiently close, the body was supported by the head of the bone, on the right side, which was found; and by pressing the right os ilium, still more and more, against this head, had caus'd the os ilium to be hollow'd out thereby.

And I have observ'd, that something similar to this was seen formerly by Parey; as you will learn from a certain passage of his (*i*), which I think it worth while to copy to you here. His words are, “it happens, not uncommonly, that excrementitious humours fall with such violence upon the cavity of the hip-joint, in the case of a sciatica, that the ligaments being relax'd, they easily push the head of the femur out of its place, never to be restor'd, if it continue displac'd for some time: because a humour, which has in the mean while fallen into that cavity, concretes by delay into a kind of stony substance; and that joint of the thigh has form'd a new cavity for itself by attrition, in the neighbouring bone: and the lips of the true cavity, which are cartilaginous, have become more streighten'd, and more depresso'd.”

Moreover, these observations and others, if there are any, when the femur, either sound or broken, has lain upon the external part; observations, that is to say, of a new acetabulum being hollow'd out, sometimes, in the os ilium, without dissections of bodies, the successors of Hippocrates could not have been ignorant of, any more than Hippocrates himself, in that passage of his book *de articulis* (*k*); which, if I quote it according to the version generally follow'd after Cornarius, you will understand it less easily, in my opinion, than if I produce it from the version of Felicianus, join'd with the interpretation of Galen.

Thus then Hippocrates, when speaking of the head of the femur being luxated. “Yet when the joint has made some delay in the fleshy parts, whereinto it has fallen; and the flesh has contracted a lentor; it becomes free from pain in process of time. And when it becomes free from pain they can walk without a stick, if there be no other impediment: and can support the body upon the injur'd limb.”

(*b*) De modo quo ossa se vicinis accommodant partib. § 42.

(*i*) Oper. l. 17. c. 22.

(*k*) n. 63. apud Marinell.

And thus it is that Galen interprets these words (1): “By metonymy h^e has made use of the word *τριβον*, or delay, from the places which, by the long continuance of travellers, are become beaten and familiar. And this is the purport of his discourse. When the head of the femur, which has been dislodg’d, from its proper seat, into the external part, is fix’d in the flesh: those who are thus affected suffer pain, in the beginning, from the compression; but afterwards, in process of time, the flesh grows callous in this part, just as the hands of labourers do. And when this is the case, the place becomes similar to an articulation; the head of the femur making use of this beaten path, or bed, as it before made use of the acetabulum of the hip.”

And after having said how “a ropy and mucous kind of humour” is left there, after inflammation; “that,” says he, “is very convenient for the motion of the head of the femur. For, by reason of this humidity, they make use of this path, or bed, as if it were a joint.” From the comparison, therefore, of these things, you plainly perceive what those ancients conjectur’d in this affair; and, moreover, what was shown by the dissection of morbid bodies.

And all these things I have premis’d, by a long discourse in the very beginning of this letter, that I may clearly show, in a few words, to what purpose each of them tend; and which of them are confirm’d by the observations presently to be produc’d. The first of these observations is from Valsalva.

7. A woman, of sixty years of age, who labour’d under a difficult respiration, and a cough, had her os femoris luxated by a fall. A continual fever then came on: which encreas’d the difficulty of breathing, and carried off the woman on the eleventh day.

The belly being laid open, the liver was found to be hard: and in the gall-bladder were many calculi.

On opening the thorax, the lungs appear’d to be variegated with large black spots; both internally and externally. On the right side was about a pint of water; on the left side of the thorax was a little only. The right auricle of the heart was dilated, and fill’d with a polypous concretion: and in the left ventricle was another, which was produc’d, from thence, into the vessels.

At length, as to what relates to the femur itself, it was found to be really luxated; in consequence of that ligament being relax’d, whereby the head of the femur is connected to the acetabulum of the os innominatum.

8. Those symptoms which had preceded the luxation, the difficult respiration, and the cough, may be accounted for from the dilatation of the auricle, from the water found in the thorax, and from the hard liver. The fever, which succeeded the luxation, may be ascrib’d to the pain and irritation which the luxation brought on the neighbouring parts: and from the febrile motion of the blood, affecting the lungs, and the other viscera, may

(1) in l. Hippocr. de Artic. Comment. l. 3. n. 93.

we account for the difficulty of breathing being encreas'd, and for death.

But as to the luxation happening without a fracture of the cervix, that is to be attributed to the laxity of the ligamentum teres, as it is call'd; which was perhaps naturally less firm, and strong than usual, and therefore already dispos'd to be more relax'd from the fall, and easily to give way. Nor is this observation contrary to the opinion of Ruysch; as he has affirm'd, that this rarely happens, as I have said above (*m*); but has not, as some pretend, denied that it ever happens.

But now take these two observations of the cervix being fractur'd; the first of which was made by the pupils who practise dissection with me, and the other by myself.

9. A rustic man, having fallen down from a tree, was suppos'd to have luxated the femur. The surgeons having endeavour'd to replace this bone with the more diligence, as they thought they could, with their hands, perceive the head of the bone which had been dislodg'd; it happen'd, accidentally, that these young men, who had, more than once, heard me assert, that a fracture of the cervix happens much more easily, from external force, than the luxation of the femur; and mention in what manner the great trochanter had impos'd upon Parey himself (*n*), for the head of the femur; did not scruple to interpose their suspicions, but could not withdraw the senior surgeons from their prejudg'd opinion.

Therefore, about the end of two months, a disorder of the thorax having seiz'd upon the man; who had not as yet risen out of bed; and carried him off by a kind of suffocative catarrh, before the end of the year 1727, they were resolv'd to determine their doubts by dissection, and see whether they or the surgeons were deceiv'd.

The upper part of the os femoris being laid bare, and the acetabulum into which it is inserted, they clearly shew'd to all the students of anatomy and surgery who were present, that the cervix was broken through in the middle; one half of it adhering to the head, which remain'd firmly fix'd in its acetabulum, and the other to the os femoris, near to the trochanter; which, in the man's life-time, had been taken by the surgeons for the head of the femur.

But how many, and what kind of calculi, were found by them in the gall-bladder of this man (who was not icteric) and brought to me; and what experiments I made thereupon; I shall not repeat in this place, as I have written to Schroeckius upon the subject; and he has publish'd the letter (*o*).

10. A woman, about forty years of age, of a fat habit of body, and lame on the left side, had lately receiv'd a violent contusion upon the lower ribs; and being seiz'd with a fever, was carried off thereby within fifteen days, in the year 1742: at which time, as I was teaching anatomy in the college, the carcase was carried thither from the hospital. Where I observ'd nothing peculiar in regard to that contusion.

(*m*) n. 5.(*n*) supra, n. 2.(*o*) Act. N. C. Tom. 2. Obs. 167.

But I made other remarks there, and in particular such as relate to the cause of lameness. And these, after relating some appearances observ'd in the thorax, and belly, I will accurately describe to you, as I then demonstrated them to the great number of auditors who were present.

The right auricle of the heart, and the inferior vena cava, contain'd polypous concretions, not without a great quantity of white substance : and concretions of the same kind were contain'd in both the ventricles ; that in the left being much the largest. From the curvature of the aorta arose not three, but four arteries ; for the left vertebræ did not arise from the subclavian, but betwixt that and the carotid of the same side.

In the belly the genital parts, the kidneys, and the sanguiferous vessels, offered these things which were worthy of remark. The surface of one of the testes was very unequal. The osculum uteri was surrounded with no corona ; so that there was not any protuberance within the vagina. And the kidneys, in proportion to the middle-siz'd stature of the woman, were both of them longer than they generally are : the left was somewhat hollow'd out, by a cicatrix, on its external surface, and at the lower extremity ; and the circumference of this cicatrix approach'd, in some measure, to the figure of a circle ; the diameter of it being equal to a finger's breadth ; and the whole cicatrix being, as I suppos'd, the remains of an hydatid, which had been formerly partly buried in the substance of the kidney, and partly prominent therefrom.

The trunk of the large artery was thinner than usual, and did not send forth the spermatic artery ; but this came out from the emulgent ; nor did it give out the lumbar arteries in the usual manner ; nor was the left iliac of an equal length with the right, but a third part shorter.

And I beg of you to attend to this circumstance, as we now go on to those things which related both to the causes and to the effects of lameness. For on the left side the woman had been lame, as I said ; that limb was four inches shorter than the other, and had the calcaneum turn'd towards the outside ; yet was not less fat than the right, but even still thicker, though this was owing to an œdematous tumour.

The iliac vein therefore, on the right side, was wider than it naturally is ; but the left, and its branches, were so thin, slender, and pale, that being surpriz'd at an appearance which I never saw before, I open'd the trunk of the vena cava at its lower part. Which being done I was still more surpriz'd. For instead of the orifice of that iliac vein I found a line which was a mark of its coalition ; in which line were two or three small orifices communicating with the iliac vein.

Having cut into this vein in a longitudinal direction, and having seen, besides filaments of a polypous nature, a kind of fasciculus of fibres protuberating internally ; I soon after easily observ'd that the parietes of the vein had coalesced with each other on one side ; and by these means represented that fasciculus, the appearance of which entirely vanish'd by drawing the parietes asunder with both hands : nor was the separation difficult.

But then laying bare the crural arteries and veins, from the belly quite to the ham, in both limbs, no difference appear'd in the arteries ; yet the vein which was associated with the left artery, appear'd to be at least a third part

narrower than that of the right side : and although it had not parietes which were folded together, and beginning to coalesce, yet it had, betwixt its coats, a kind of black blood as it were, and perhaps a real blood ; but such as to all appearance seem'd to have been concreted a long time before.

Having examin'd these things sufficiently, I enquir'd into the cause of the lameness, by laying bare the articulation of the os femoris with the os innominatum : and the os femoris was found to be depriv'd of its neck and head. As to the head of it, this remain'd fix'd in its acetabulum, though the cartilage, wherewith both of these parts were incrusted, was corroded here and there : and indeed the bony substance of the head of the femur, both where it was turn'd to the left parietes of the acetabulum, and where it had formerly coher'd with the cervix, was not quite sound and entire.

And as to the cervix, no traces of it remain'd, if you excepted some bony fragments, adhering to very thick ligaments, into which the capsular ligament seem'd to have been chang'd ; at least these ligaments were produc'd from the margin of the acetabulum to that part of the superior extremity of the femur, from whence the cervix formerly began, and connected the femur to that margin. And in the cavity which lay betwixt them, in the place of the cervix, was a thickish matter of a fleshy colour, but brown and dirty ; yet not foetid, nor in great quantity.

Besides these appearances, the os innominatum, on the left side, was more prominent forwards than the right ; so that it was natural to suspect that the same external violence, which had broken the cervix of the os femoris in this woman, when she was an infant, or when she was very young, had likewise luxated the os innominatum.

11. If you compare these two observations with each other, you will easily come into this opinion, that Ruysch's (*p*) finding no remains of the fractur'd cervix, is to be attributed to the length of time, and to the frequently-repeated agitations and frictions of the fragile extremities of the broken cervix one against another : and besides these to the eroding power of the acrid particles, distilling from the injur'd and vellicated membranes, and bringing on a caries by stagnation.

But as to what I have taken notice of, in regard to the periosteum being lacerated by a fracture (*q*), I mean that it frequently becomes harder and thicker than natural ; you perceive, from the second observation, that the same thing happens to ligaments. And as to what is said, in the same observation, of the extenuation of the iliac veins that corresponded to the injur'd limb, I would have you compare it with the dissection of another lame woman that I have already describ'd to you (*r*).

For you will find that the iliac vessels, going to the lame limb, were thinner than usual. Yet you will not only find it, extenuated to such a degree through the thigh, but will not find it contracted in the belly by the coalition of the parietes on one side ; nor yet almost stopp'd up at the orifice by which it opens into the vena cava. For it is a very rare appearance, and not easily to be understood, the limb from which it return'd labouring under an œdematous tumour indeed, but yet being alive ; although we

(*p*) *supra*, n. 4.(*q*) *Ibid*.(*r*) *Epist.* 46. n. 17.

suppose it not to have been reduc'd to this state for a long time before.

However, the os femoris, in this woman, could not have receded far from the acetabulum, by reason of the connecting ligaments. And the man, of whom I spoke before her, having always lain in bed, had no occasion to make use of, and to stand upon, that limb. Now, therefore, give me leave to tell you what appearances I found in another woman, and in another man also, who had for a long time had the head of the os femoris luxated, and not replac'd; and had for a long time borne upon the limb.

12. A lame old woman was now very near to her eightieth year, when being seiz'd with an apoplexy, she died not long after; yet not so much from the apoplexy, as from the effect of it, which was but little attended to. For as the power of the bladder, by which it both retain'd and discharg'd the urine, was lost by paralyfis; the assistant women, deceiv'd by the continual dripping, thought that as much urine was discharg'd from the bladder, as was continually flowing down into it: and the old woman herself either could not feel, or could not make known, this very great distension; so that it happen'd to her, as it has happen'd to others from the same fallacy (s), that she died very soon.

For the body being brought into the theatre, that I might begin to teach anatomy from thence, in the month of January of the year 1735, that cause of death came first into view, and perverted the order of teaching. For when the belly was open'd, the bladder appear'd to be so distended with urine, as to reach to the navel, and to occupy both the ilia; the intestines being driven upwards in such a manner, that on one side they forc'd the liver and diaphragm up very high, and on the other side push'd the spleen and the stomach towards the middle of the epigastrium.

But the viscera were all of a green colour, and had a very putrid smell; so that I order'd them all to be immediately taken out of the belly, and buried in the ground. What appearances therefore I observ'd in the thorax, the neck, and the limbs, that were preternatural, I shall add here; for having, in the mean while, got better bodies, we did not touch the head.

The pericardium was connected with the anterior surface of the great vessels, and of the heart: with the former by filaments, but with the latter by itself; and that for as great a space as two inches would have cover'd, both in length and breadth. And this circumstance made me enquire, from him who had been the physician of this apoplectic woman, whether her pulse had been, in any sense, peculiarly irregular, and, in particular, whether they had intermitted; which he immediately and expressly answer'd in the negative.

The great artery began to become rough, on its internal surface, at a small distance above the valves; as if from a prominence of fibres drawn in a longitudinal direction, and disjoin'd from each other here and there: this roughness was extended for two inches in length, and somewhat less in breadth. The thyroid gland, besides being very large, had its anterior sur-

(s) Vid. Epist. 42. n. 22. ubi & hæc historia promittitur.

face also prominent with certain globular bodies as it were, or at least in some places.

The left of the lower limbs, on which side the woman had been lame, was turn'd with the knee towards the inside, and with the heel towards the outside: it was also shorter than the right, and if you excepted the back part of the foot, in which part it seem'd to be pretty thick, was very much extenuated, and moreover deform'd with a large cicatrix, as if from a large ulcer which had occupied the external part of the fibula longitudinally; whereas the right limb had a very good appearance, was well nourish'd, and furnish'd with such wide veins, that I never remember to have seen wider in any lower limb whatever.

And as this was a proof of a greater quantity of blood flowing into that limb, in proportion as less flow'd into the opposite, so it made me regret having order'd the viscera and vessels of the belly to be buried; as it was now no longer possible to see how the left iliac vein appear'd near to the cava.

Finally, the superior joint of the left os femoris being laid bare, we found the head of that bone not so globular as it generally is, but become almost flat as it were, and somewhat enlarg'd; nor was it furnish'd with any round ligament by which it could be connected. It was receiv'd into an acetabulum less hollow than it naturally is, yet incrusted with a cartilage. And there was at the anterior border of this acetabulum, another cavity much less than itself: a cavity of which kind was no where before the acetabulum of the right os femoris.

Moreover, the acetabulum of the left, although if you referr'd it to its own os ilium, that is, to the os ilium of the left side, seem'd to be neither lower, nor higher, nor more posterior than that of the right, if you compar'd this also with its own os ilium; yet it was more distant from the commissure of ossa pubis than the acetabulum of the right side. For the left os ilium was also much more distant from the same commissure than the right os ilium.

13. Those things that relate to the connexion of the heart and pericardium, join'd with no intermission of the pulse, you will refer to that place (1) where we have already treated of connexions of this kind, and their effects.

But as to what relates to the acetabulum, in which the head of the femur was receiv'd, I do not doubt but by comparing this observation of ours, with those of the celebrated men taken notice of above, you will readily acknowledge that this had been hollow'd out by the head of the bone, which had long before fallen out from its natural acetabulum; the vestiges of which were still remaining in that very near, anterior, and much less cavity.

For as to the new acetabulum being less deep than the natural acetabulum is, and the head of the femur being inclin'd from a globular to a flat figure; you very well understand, from these marks, that while one bone was press'd against the other by its weight, or forc'd by the motion of the muscles, the

(1) Epist. 23. n. 18.

(2) n. 5. & 6.

one was mutually rubb'd by the other, and depress'd; so that by this means the acetabulum was hollow'd out, which if nature itself had prepar'd, would not only have been form'd deeper and nearer to the commissure of the pubes, but the head of the bone would have been globular, and connected by the ligamentum teres.

For as to its being incrusted with a cartilage, the cartilaginous nature perhaps had not been, as yet, chang'd into a bony nature in that part when the excavation was begun; so that it was not superinduc'd afterwards, but only preserv'd.

As to that other cavity, however, which was nearest to the commissure of the pubes, being the old acetabulum, and prepar'd by nature itself formerly, this is clear from the situation of it; nor does the smallness of it contradict the supposition: whether, as it perform'd that office in the beginning of life, it never was requir'd to be of a larger size; or whether, as we frequently see in the sockets of the teeth, upon taking away the bone which was before inserted, the bony substance around it increases, and fills up, or nearly fills up, the sinus: and this I also have seen in a lame man, whose history I promis'd to compleat in this place.

14. The wool-comber, therefore, whose mortal wound I have describ'd on a former occasion (x), was lame on the right side, as I have there said. This man being born with an equality of both lower limbs (for of one who was well known I could learn the circumstances I enquir'd after, though I have endeavour'd at it in vain in regard to others very frequently) his mother observ'd, when she was taking him out of the cradle while he was yet very young, and even in the first months of his life, that he had a pain in the right limb; whether some external accident, unknown to her, had brought it on, or some internal cause.

After this pain, that limb then became shorter; so that when the boy began to walk afterwards, it was surprizing to nobody that he should be lame. And by habit he gain'd an easy and expeditious method of walking, notwithstanding his lameness.

The disease of the joint, from whence the occasion of another disorder, though but inconsiderable, had arisen, in my opinion; that is to say, a disorder which had incurvated the spine of the thorax, somewhat to that side, while the man endeavour'd to incline the weight of his body to the left limb, which was more firm; the disease of the joint, I say, on the left side, appear'd in the following manner.

The acetabulum, which nature had prepar'd in its usual situation from the original formation, remain'd only in one half of it, and that anteriorly: and in the fundus thereof was a kind of substance of a reddish, but pale colour, so as to seem morbid; and if you touch'd it, you would suppose it to be not of a ligamentous, but, in some measure, of a glandular nature.

The other half part of the acetabulum was fill'd with a bony substance, and was, besides, cover'd over with a bone in some measure round; into which the neighbouring surface of the os innominatum had grown out. Above this old acetabulum was, on the external surface of the os ilium,

another acetabulum as it were, constructed of a white firm substance, and very similar to that whereof the ligaments are constructed; a border being moreover added, into which it was prominent, not only on the anterior, but also on the superior part; and which was of a middle nature, betwixt cartilage and ligament.

This surface of the acetabulum was smooth, if you excepted one place therein, which was lower than the other part; and was fill'd up by a reddish, and not very small, substance, that was easily known to be a mucilaginous gland. Into this acetabulum the head of the femur was receiv'd, which was furnish'd with no ligamentum teres, as usual, nor endow'd with its wonted magnitude, form, or smoothness. For where it began to ascend from the cervix, there none of these properties was wanting. But after it had proceeded thus for some little way, it was depress'd, and shew'd the bony substance depriv'd of its cartilage: yet this bony substance appear'd firm on the upper part, hard, and of a white colour; but granulated, just as we frequently see the surface of calculi of the urinary bladder to be.

15. If it seem'd surprising to you, that, in the old woman of whom I spoke just now (*y*), the new acetabulum did not want a cartilaginous crust; it will perhaps seem more wonderful that, in this man, it did not want a mucilaginous gland: not to mention the border, or supercilium, as it is call'd, of the same kind with that wherewith the natural acetabulum is furnish'd.

Without doubt many things are form'd whose mode and ratio of formation are very obscure. Nor does it fail to excite admiration, that the old acetabulum, in so long a time, was not more fill'd up at least, if not entirely obliterated: and it is also surprising, that, as the bones were tender, the new acetabulum itself was not hollow'd out into the bones, but was even made up of a substance which may seem to agree more with the opinion of Hippocrates and Galen (*z*), than with the observations of later authors.

But it is my business to describe, with the utmost fidelity, those things that I, and all who were present, perceiv'd with our hands and our eyes; whether they are of a surprising nature or not: and it is your business to observe, that the lost use of limbs is repair'd by nature, in more than one way: and although the method discover'd by the more modern authors may be true in other bodies, it does not therefore follow, that the method which the more ancient authors had hinted, can never happen in any.

But if you still desire other examples of analogous articulation, as it is call'd, either that you may compare them with those which are given by us, or that, at least, you may have more to join to the Sepulchretum; read over attentively the very learned dissertations of Saltzmann, and other observations of other persons, and of his also, which I have referr'd to above. And to these join those that are extant in the writings of those celebrated men Guttermann (*a*), Schlitingius (*b*), and Ludwigius (*c*); and if you desire to know of a new articulation, made from a luxation in the upper limb also, that of Henry Albertus Nicolaus (*d*).

(*y*) n. 12.

(*z*) Supra, n. 6.

(*a*) Act. N. C. Tom. 3. Obs. 105. in fin.

(*b*) Commer. Litter. A. 1741. Hebd. 1. n. 2.

(*c*) Prog. de Collo Femor, &c.

(*d*) Dec. Obs. illustr. Anat. Obs. 6.

And not to recede from the lower limb, whereof we are at present speaking; in the second and third of these authors, and in like manner in Platner (*e*) and others, you will find a great number of remarks relating to the fracture, or luxation, of the thigh at its upper part; and the latter of these sometimes from external force, sometimes from an erosion of the ligaments, and at other times from laxity.

From erosion, for instance, as in the case publish'd at Hall, in the year 1742 (*f*), and in others before propos'd by Mauchartus (*g*), and by Schulzcius (*h*); and from laxity, as in the example of the celebrated Boettcherus (*i*), than which you will not easily find one more extraordinary; for the ligaments, of which we are speaking, were so relax'd, in consequence of a pestilential sciatica, that "they made both the feet longer to the measure of a whole span, than they had been in their natural state:" which is indeed surprizing; but another circumstance still more so; I mean that the patient was perfectly cur'd, "so that she could walk again, after that, freely, and without any inconvenience."

Finally, you will also add to the number, that luxation which is spoken of by Petit the surgeon (*k*); which did not happen so much from an external cause, as from an injury brought thereby upon the mucilaginous glands of the acetabulum: so that the mucilage, being secreted in greater quantity, and relaxing the ligamentum teres gradually, or breaking it, forc'd the head of the bone out of its cavity, after a long time, though not immediately.

16. Thus far you have heard of the more considerable diseases that we have met with in the upper joint of the thigh. Nor was that inconsiderable which was observ'd in a lame woman, whose history I defer to the next letter, in which the gout will be treated of (*l*). There are also some more slight disorders, with regard to which, as they have been seen in lame persons, we must not here fail to speak, and endeavour to lay open their nature.

17. An old woman of Tuscany was so lame, from a contusion of the coxendix, that she was oblig'd to confine herself to bed for a long time. A pain of the whole body came on; and, from her long-continued posture, a gangrene about the buttocks. Therefore gradually sinking, and becoming weak, she died about the beginning of March in the year 1744, in the hospital at Padua.

Although the body of this woman was of use, in order to take notice of, and demonstrate, to the pupils, many parts in their natural state, which are foreign to the present purpose; yet in doing of this I did not fail to remark some things which related more to the present occasion.

In the belly, the right lobe of the liver, on its upper and convex surface, and from the posterior to the anterior part, was hollow'd out into so deep a sulcus, that it would admit the finger; nor were other sulci wanting more to the right hand than this: and if these kinds of sulci were found in women

(*e*) Instit. Chir. in not. ad §. 1193. & 1194.

(*f*) De Amput. Femor. non cruenta § 18. ad n. 6.

(*g*) Eph. N. C. Cent. 9. Obs. 34.

(*h*) Act. N. C. Tom. 1. Obs. 235.

(*i*) Eorund. Act. Tom. 7. Obs. 21.

(*k*) Mem. de l' Acad. R. des Sc. A. 1722.

(*l*) Epist. 57. n. 2.

only, there might be room for hesitation, whether they were not the effects of having worn very stiff stays, which women are wont to do while they are young.

The liver itself seem'd to be made up, both internally and externally, of very small and white corpuscles, which were intercepted by very slender interstices, of a brown or reddish colour inclining to yellow. The gibbous surface of the spleen was white, as if from a kind of thick crust; the flat surface was black.

The testes were very much contracted, and depress'd into a kind of thin lamina. The orifice of the uterus was large, in some measure triangular, and surrounded with no protuberating ring. The whole internal surface of the fundus was black and gangrenous.

The thorax was encompass'd with twelve ribs on the right side; but on the left with eleven only. For the first and second of these consisted, in the chief part, of no more than one bone: that is to say, these two, having come out separately from the vertebræ, by their little heads, had scarcely pass'd the length of an inch but they became one broad bone; in which there was not the least appearance of there ever having been any division.

That bone, when it had gone so far, as to be distant from the sternum about the space of three inches, sent, from its upper border, a round oblong cartilage into the sternum; which cartilage was scarcely equal to half the breadth of a little finger: and the bone, being then contracted in its other part, yet so as to retain its breadth; which was not less than that of the first right rib; and leaving a small space betwixt itself and that round cartilage, was join'd to the sternum by another proper cartilage.

In the pericardium was some quantity of water. The right auricle of the heart was distended with blood. The heart itself, even when the fat was remov'd from it, was much larger than it ought to be; and not only on account of the ventricles being wider than usual, and particularly the left, but also on account of the parietes of this last-mention'd ventricle being much thicker than when of their natural size.

Part of one of the mitral valves was become bony; or at least had a little bone subjoin'd to it, which was made up of many bones, as it were, and for that reason unequal, of a roundish figure, and, in its magnitude, equal almost to the point of the little finger. In the heart were some polypous concretions, and a great quantity of black blood: and the same kind of blood, though more fluid, flow'd out, in several places, from the larger veins, when cut into.

Finally, upon examining the upper joint of the lame limb, I found the ligamentum teres, which has so often been mention'd, to be less thick and firm therein, than it naturally is; and to be almost universally ting'd with a pale redness.

18. Another old woman, who was already crooked from age, and who was wont to walk as if she were lame, had lately fallen down stairs in the night, and greatly hurt her head. And this was the cause of her death. As she was dissected, by me, in the same place, before the spring-time of the year 1749, some things were observ'd that relate to the present subject.

In the thorax, the trunks of the large vessels were so much on the left side; although the woman was not gibbous, but only crooked with age, as I have said; that I never saw the *vena sine pari* more inflected to the left side, in order to open itself into the cava.

In the belly, the external surface of the kidneys was not altogether natural: and, indeed, one of them, moreover, shew'd some small hydatids, which were somewhat protuberant therefrom. In examining the genitals, I observ'd that the left nymphæa was not to be found at present, nor ever had existed; and the right was small. The hypogastric arteries were wider than usual, and hard; and one of them was not without an ossification, where it sent out the umbilical artery. When I, at the same time, examin'd the neighbouring iliacs from whence they arise, and saw that the right did not at all differ from its natural state, either in breadth, or in the thickness of its coats; I wonder'd to find the left not only less wide than usual, but, particularly, furnish'd with such very thin parietes, that it seem'd to be a vein, almost from that place where it gave off the hypogastric artery, quite to the part where it came out of the belly.

And this circumstance brought to mind what I had seen in two other women (*m*); although in them, not the arteries, but the veins, were narrower than usual, nor ceas'd to be narrow in the thigh, of which they had been lame. But the artery of this woman, when it had come out from the belly, entirely recover'd its proper width, and thickness of parietes; as I clearly perceiv'd by comparing it with its fellow on the right side.

However, in the upper joint of the thigh, on the left side, I could observe nothing from whence to account for that slight lameness; unless you should suppose that two small and slight contusions, as it were, of a brownish colour, which were distinguish'd in the cartilage that invested the head of that femur, and lay near to each other, might have a relation to this effect.

19. There were two other lame women also, (for it has happen'd to me to find this disease more frequently in them than in men, whether by mere accident, or because, by reason of their structure of body, being less robust, women are more subject thereto) in dissecting of whose bodies I thought that I had found a more manifest cause of that disorder; but I afterwards doubted whether I was not deceiv'd. Be this as it will, I will here first relate to you both of the observations; for they contain other remarks that are not to be doubted, and that were promis'd you by me formerly, amongst those observations that relate to lameness; and then will likewise declare the cause of my doubt.

20. A lame woman, who was not very old, had been carried off by a dropsy, about the middle of December in the year 1746. As I demonstrated, from this body, only the brain, the genitals, and the left limb, of which she had been lame, to the students of anatomy in the hospital; I observ'd no more, in relation to the present subject, than what follows.

In taking out the brain, I observ'd, in the dura mater, where it invested the basis of the cranium, a little before; but somewhat on the outer side;

(*m*) Supra, n. 10. & 12.

a little, I say, before the foramen into which the left optic nerve passes, that something adher'd, which, if I trusted to the colour, seem'd to be a small part of the cortical substance. Yet it was not soft, nor was the pia mater, which answer'd to that place, lacerated; but even appear'd to be sound and smooth.

Then attending to it more diligently, I saw it to be a globule, of the bigness of a small grape, somewhat hard in its substance, and solid; nor did it adhere to any thing, but at the lower part of it, as its smoothness shew'd; and by this it was very firmly fix'd to the dura mater only, and not to the bone which lay beneath it: so that I judg'd it to be an excrescence of the same membrane, of a glandular kind, as the modification of its substance shew'd; and the beginning of a tumour, which, if it had increas'd, would not only have injur'd the neighbouring optic, and olfactory nerves, but the brain also.

From the upper and exterior part of the fundus uteri, to the right side, a tubercle was prominent, of the same figure and magnitude which was just now taken notice of, in that excrescence of the dura mater; being equally solid, but white. To this corresponded another, internally, that was pretty soft and low, and manifestly made up of a congeries of vesicles, of the same kind with those we generally see in the cervix uteri; for they were fill'd with the same limpid mucus as these: and this is the tubercle which I promis'd, in the forty-seventh letter (*n*), to speak of here.

The substance of the uterus, which lay betwixt both these tubercles, was perfectly sound. But the other parts, that belong to the genitals; if you except the testes, one of which was less than the other, but both of them contracted, of an unequal surface, and internally and externally white; were not only sound; but the lowest of all were nearly in the same state as they are in virgins.

For that part which is call'd the furcula, was tense; the orifice of the vagina was narrow; and furnish'd with a hymen; except that here, contrary to what we generally see, it became less broad, in proportion as it was more distant from the orifice of the urethra; as I shall more accurately describe in another place. Yet this woman did not seem to have had knowledge of a man.

Finally, it was manifest to all who saw the lower limb on the left side, that it was so situated, as to make the toes of the foot be turn'd towards the other foot; nor was it easy for the hands to restore them into their natural situation: and the woman was said to have walk'd by bearing on that part of the metatarsus which is nearest to the toes. But as the foot, the leg, the knee, and the thigh, as far as could be judg'd by looking upon them externally, were free from disorder, and seem'd to be each of a proper length; I laid bare the upper joint of the thigh, and thought that the cervix of that limb seem'd to be shorter than the middle-siz'd stature of this woman seem'd to require.

21. A little decrepid old woman, who was lame also, died about twenty

(*n*) N. 20.

days after her last spoken of, of an abscess, if I remember rightly, of the arm. Dissecting, therefore, the same and other parts over again, we found the following preternatural appearances.

When I look'd upon the brain, after it was taken out from the cranium, and inverted; I observ'd that the trunks of both carotid arteries, and the larger branches thereof, appear'd very firm: and I found that the parietes thereof were really become much thicken'd. On the other hand, though the nerves, and particularly those of the fourth and fifth pair, were very fine, firm, and thicker than usual; yet I saw the optic nerves to be depress'd into the form of a thin bandage, narrow, and of a cineritious colour; and that medullary part, which is interpos'd betwixt them, where they join one another, to be pretty broad indeed, but not at all different from them in colour, or thinness.

And they themselves; though when they had gone within the orbits, they were of a white colour, and of a moderate kind of thickness; when cut into, nevertheless, shew'd that whiteness, and a considerable part of that thickness, to be owing to their meninges being become thicker than usual: within which meninges, as within a pretty firm kind of tube, was contain'd a bloody substance, particularly in one of the nerves.

As the eye, to which this nerve went, as well as the other, shew'd no disorder when look'd upon externally; so neither did it shew any internal disease, when it was dissected by me: so that I very clearly perceiv'd this disorder, which I have describ'd to you formerly (*o*), in the optic nerves, not always to have its occasion and origin from diseas'd, and perfectly blind eyes, (for they affirm'd that this woman, surprising as it is, was not blind, unless it was that she saw a little with the other eye) nor yet from the brain, but that it first arises, sometimes, in the nerves themselves (*p*).

In this woman, at least, though I accurately dissected the brain; within which I could scarcely follow these nerves, by reason of their thinness; I met with no disorder in their passage, or in their thalami. And although I observ'd the hippocampi, at their lower and extreme part, to be not at all dilated, as they generally are, yet there was not the least reason to believe but they had been so from the original formation.

And besides this, there was nothing unusual, not to say morbid, in the whole brain: except that in the fourth ventricle, instead of those medullary fibres, which occur on both sides, for the most part, and go to the acoustic nerves, there was but one on each side, and that slender; rising, and having its situation lower than usual.

In the lower jaw I observ'd some things, which, in this letter in particular, where we treat of luxations and fractures of the bones, ought not to be omitted. For the small head of this bone, to the left, grew out from one side of its superior surface upwards, as if from a new additamentum; as I have heretofore said (*q*) was seen by me in the internal parts of the cranium of a certain old woman; for this bony excrescence also was white and firm; and,

(*o*) Epist. 13. n. 7. & seq. & Epist. 52. n. 30.

(*p*) Vid. Epist. 63. n. 8. in fin.

(*q*) Epist. 27. n. 2.

besides, like the remaining part of that head, incrusted with a thin and very smooth cartilage.

If this additamentum had been rais'd up, more and more, by its increase, there is no doubt but it must have thrown the head out of its sinus; or, at least, that it must have very much incommoded the motions of the lower jaw. And indeed that it had, in part, begun to do so already, this perhaps was a testimony; that the moveable cartilage, which lies betwixt the head and the sinus, appear'd, in the middle of it, to be cut with a knife, as it were, in two places; in one longitudinally, in the other in a transverse direction, and obliquely.

And I said perhaps, even because the cartilage, answering thereto in the right joint, was pierc'd through with a very small foramen, in the form of an ellipse, and shut up by no membrane, (though I know that a larger than this was seen formerly (*r*)) and although this was situated in the middle, but nearest to one of the extremities, and placed longitudinally, I nevertheless evidently demonstrated, that, in this subject also, neither of the cartilages consisted of two.

But as, besides the dentes incisores, this old woman had no tooth left; having shown the whole part of that jaw, on both sides, which had been formerly furnish'd with the other teeth, not only to be without all traces of sockets, but to want that portion of the bone in which the sockets formerly had been; so that the foramina, through which the nerves go out (they are call'd *foramina mentalia*), were now almost in the upper and external margin of the jaw; and therefore that the height of this bone was greatly reduc'd, as is very clearly observ'd and represented by Ruysch (*s*); I added, that it follow'd from hence, in regard to those persons, in whom the body of this bone has thus decreas'd after the loss of the teeth, that in them, unless a greater hardness of the bone, on account of the advanc'd age, prevent it, the whole of the bone, on that part, must be much sooner, and more easily, corroded, sometimes, by a supervening caries; or broken by a pretty heavy stroke.

Upon examining the thorax, I show'd four arteries to arise from the curvature of the aorta; for the vertebral artery of the left side did not arise from the left subclavian; which was much more thin than the right, but, betwixt that and the left carotid, yet nearer to the former than the latter; and as this circumstance has occur'd to me in another woman, of whom we have spoken above (*t*), and in others also (*u*) sometimes, it does not seem to deserve a place among the more rare appearances.

But the great artery, betwixt the heart and the right subclavian, was manifestly dilated; and when it was cut into, quite to the septum transversum, it show'd, here and there, in several places, larger or lesser spaces, somewhat prominent internally, and of a white colour; wherein the more compact substance of the artery would afterwards have been chang'd into a bony substance.

(*r*) Vid. Stephan. cit. in Advers. II. Animad. 28.

(*s*) Obs. Anat. Chir. 82. & Fig. 65. 66.

(*t*) n. 10.

(*u*) Vid. Epist. 3. n. 20. & Epist. 15. n. 26.

At the upper part of the genitals, and within one of the testes, was an hydatid, of a considerable size; so that it extended itself to make up a part of the surface of the testis: and, at the lower part, the orifice of the urethra, from whence the internal coat of that tube; in the same manner as the internal coat of the vagina, or rectum, sometimes is; having inverted itself in a small degree; was prolaps'd outwardly on one side: and this I have already said (x) I had seen in another woman, as well as that I was to speak of this woman in the present letter.

Last of all, the right limb, of which she had been lame, was shorter than the left: and being, as in the former woman, turn'd inwards, seem'd to have the same cause of this disorder as in the former; I mean the shortness of the neck of the femur.

22. And thus it really seem'd to me at the time; and perhaps I was not entirely deceiv'd. But I was displeas'd with myself afterwards, that I had not compar'd the neck of the lame thigh with the neck of the sound one: which would have been the only proper method of demonstrating, whether I had, with justice, suppos'd the former to be shorter than natural, or not. For perhaps that might seem shorter than usual, which was of a proper length, and well-proportion'd to a body of no large stature: and there are so many causes of lameness, not only above the acetabulum, but in the acetabulum, and below the acetabulum, that, although I saw many of them to be absent, yet perhaps I could not sufficiently discern whether all of them were absent or not. And I choose here to take notice of the greatest part of them, in that order which was just now refer'd to.

Above the acetabulum is any deprav'd situation whatever of the os innominatum; a situation of which kind was added to the other disorders, in those two lame women whom I describ'd above, before the others (y), particularly in the first. And the celebrated Bassius (z) produces many examples of a diastasis, or separation, of the os sacrum, from this bone, in children that are lame; adding the reasons why this easily happens to infants, the signs whereby it may be distinguish'd, and the causes for which it is difficult to be cur'd, and therefore may remain through the whole of life; as in a Venetian young man who was brought to me for the sake of taking my advice, I saw that it had remain'd from childhood, and judg'd that it would always remain.

And if you consider duly these things; whenever you see that one limb is manifestly longer or shorter than the other, and the cause of this inequality is not manifest in the limb itself; you will first of all examine whether the situation of the ossa innominata is unequal; for this situation is follow'd by that of the acetabulum, as it is hollow'd out in these bones, and that of the acetabulum by the limb; lest by supposing those bones to be alike in their situation, which are not so either naturally, or by the force of disease, you are soon after deceiv'd, in judging whether the limb itself be really longer or shorter than it ought to be.

(x) Epist. 50. n. 51. Vid. & Epist. 70. n. 10.

(y) n. 10. & 12.

(z) Dec. 4. Obs. Anat. Chir. 2.

23. And in the acetabulum itself, you very well conceive, from what has been more than once said above, that the capacity and figure of the ligamentum teres, and the head of the femur, may be diseas'd in many ways. And to these things we must add tumours, whether they are form'd in the ligament, as our Falloppius (*a*) hints; or in any other part within the acetabulum, as our Veslingius likewise (*b*) in general says; where he says, that he had frequently visited, with Sala, a Venetian nobleman, "in whom a tumour having arisen within the acetabulum of the coxendix, the head of the femur was evidently push'd outwards."

And Valsalva, in an opinion which he wrote for a noble youth, in whom the left limb was become longer than the right, suspected that the mucilaginous gland of the acetabulum had gradually become tumid; not only because in a boy, in other respects sound and healthy, he did not think it probable that the ligaments were relax'd, but because it is so natural to the glands to swell: and last of all, because, after laying in bed a long time, in consequence of an acute disease, that limb was found to be very much longer than before, which he accounted for from the increase of the gland, by reason of being so long uncompress'd by the head of the femur; he therefore advis'd, among other things, that the shoe under the right foot, on which the child us'd, for the most part, to bear firmly, when standing, should be so much higher than the other, as to make both the limbs equal, and enable him to bear on the left also, and compress the gland.

But in a soldier, whose case was publish'd at Hall, and which has been quoted above by me (*c*), a kind of spongy substance was really found; which by filling more than half of the acetabulum, had forc'd the head of the femur from thence.

24. Finally, under the acetabulum itself there are many more causes of lameness. For, to omit mentioning the fracture of the cervix femoris, whereof we have spoken; and the diseases of the capsular ligament, as it is call'd, the muscles, in the first place, which preserve the thigh in its situation, if they are paralytic, do not prevent the very weight of the whole lower limb from extending the ligaments, and drawing the head of the femur downwards: or if they are contracted by pain, tumour, or convulsion, they keep the head of this bone buried so much the deeper, and press'd up so much the closer, in the acetabulum, as to make the limb seem a little shorter than it really is.

And with how great a force the same muscles sometimes act, even by the natural government of the will, is demonstrated, in particular, from the case describ'd by Ingrassias (*d*), of the lesser trochanter of the thigh being pull'd away from the other parts of the bone, by some only of those muscles which a young man, of noble birth, had immoderately strain'd in the exercise of tilting: and this case becomes less incredible by the figures of Ruysch (*e*) more than by others; in which he represents the same trochanter, that had separated from the os femoris of a young man by boiling.

(*a*) Præfat. in Tract. de luxat. & fract. Ossium.

(*b*) Epist. 25.

(*c*) n. 15.

(*d*) in Gal. 1. de Ossib. c. 20. Comm. 4.

(*e*) Theat. Anat. 5. Tab. 2. fig. 2. & 3.

Indeed any fracture of the femur itself is so rarely cur'd, without a lameness being the consequence thereof, that Celsus has expressly said (*f*), "we must not be ignorant that, if the femur be broken, it becomes shorter; because it never returns afterwards into its former state: and that we tread, for the future, on the upper parts of the toes of that leg."

And it becomes shorter, because betwixt the extremities of the fracture some part is lost, which has been shiver'd into fragments; or because those extremities are adapted to each other with so much difficulty, in such a manner as to preserve the natural figure and position of the bone; as in that femur in particular, the figure of which is publish'd by Grutzmacker (*g*): or because even when well adapted to each other, the extremities are afterwards mov'd asunder by the action of the muscles, which very easily happens in an oblique and oblong fracture; whereas in a transverse fracture, one extremity pushes against the other, so that by this means they are mutually preserv'd in their restor'd position.

To these other causes of that kind, Valsalva added this; that in those oblong and oblique fractures, which are brought on by great violence and impetus, some fibres of the neighbouring muscles may sometimes be intercepted betwixt two parts of the fractur'd bone, so as to hinder an exact coaptation and coalition; or even retard the coalition for a very long time. But although none of these things which have been mention'd may happen, or though none of them may happen in that manner which we speak of here, so as to make the os femoris shorter than it naturally is; yet lameness cannot be avoided, if the muscles, the tendons, or the nerves, being very much weaken'd by the fracturing cause, or by the consequent inconveniences, either cannot move the thigh, or the parts which lie beneath it, with a proper strength, or in a proper manner.

25. It is also manifest, that even the parts which lie beneath the femur, are not only liable to most of those diseases that are mention'd, but bring on lameness in the person so affected. It will therefore be sufficient for me to say much less of each of them; beginning with the joint of the knee; which, however, is a part that belongs in some measure to the thigh.

26. A woman, of whom mention is made in the fifty-second letter (*b*), though her history was deferr'd to this letter, because she could not bend one of her knees; having receiv'd a violent blow on her forehead, which the worst kind of symptoms were immediately the consequences of, had these symptoms disappear; and lay ill in the hospital, of so slight a fever, that on the seventh day she ask'd for a less slender diet. But on the fourteenth day, behold a more violent fever attack'd her, with a coldness and perturbation of mind: and death follow'd on the seventeenth day, there being never any symptom, either in these latter days or in the former, of the thorax being affected; and no complaint of this kind being made.

It was now the month of December in the year 1745: at which time, as it was my annual custom to demonstrate a great number of things to the pupils in the hospital; and as these requir'd the dissection of the thorax,

(*f*) De Medic. l. 8. c. 10. Sect. 5.

(*b*) n. 9.

(*g*) Dissert. de Off. Medullæ.

the belly, and the limbs, they did not allow us time to dissect the head; it was not therefore open'd. But in the dissection of those other parts these preternatural appearances were observ'd.

One of the thoracic cavities had almost four pints of water, of a middle colour betwixt green and yellow; but the other much less: the lungs in both of them being perfectly uninjur'd. In the pericardium was the usual kind of moisture; nor more than that: but the heart was lax: and in the right auricle thereof was a polypous concretion of a white colour, thick, and compact. In the belly scarcely any thing was observ'd, besides an inclination of the uterus to one side.

Finally, after having compar'd the limb; the leg of which could not be bent even by my hands, being prevented, in appearance, by the knee; with the sound limb, and not being able to find any external difference by the eye, except that the rotula was somewhat more prominent than usual; I determin'd first to try whether the extensor muscles of the leg, whatever was the cause of the disease, could act in such a manner, as to prevent, by this contrary action, the knee from being bent.

Cutting these muscles therefore transversely, at a little distance above the knee, the leg could immediately be bent. And yet the knee, as the prominence of the rotula, which still continued, demonstrated, was not wholly free from disease. For the rotula was prominent, because the external condyle of the femur was not only longer from the posterior to the anterior part; which was manifestly prov'd by comparing it with the external condyle of the other femur; but was even prominent forwards, more than it is wont to be at other times. Yet on the other hand, it was equally prov'd, by comparison, that the lateral external ligament of the knee was much thicker in the other knee than in this.

27. As it has been sufficiently pointed out in the letter which I just now referr'd to, from whence that water in part, and its filthy colour, could be brought into the thorax; and as the other circumstances in the observation in question, are sufficiently clear of themselves; I will mention some things of the contrary affection of the knees, and of some of their diseases.

The knee of which we spoke just now could not be bent. And the illustrious Haller (*i*), having lit upon another which could not be extended, found no other cause of this impediment, "but a hard and almost tendinous celulosity," on that part, I suppose, or at least most on that part, which was posterior in the limb.

That the rotula should be very frequently broken transversely, as most generally happens, is not at all to be wonder'd at, when in consequence of violent blows; but this is surprizing, that either from a violent and sudden contraction of the muscles which extend the leg, or from the resistance of them, this very bone is sometimes broken; or the strong tendons of the muscles are broken asunder above it. An example of which kind of rupture you will read in the celebrated Bassius (*k*), and before him two in Ruyfch (*l*); in

(i) Opusc. Pathol. Obs. 50.

(l) Adv. Anat. 2. c. 2.

(k) Dec. 3. Obs. Anat. Chir. 6.

whom (*m*), and in Palfin (*n*) ; not to mention other authors besides those that are in my hands while I am writing ; you will find observations of this kind of fracture.

The celebrated Bassius (*o*) has also observ'd, that the semilunar cartilages, which lie in the joint of the knee, betwixt the femur and the tibia, may sometimes grow out, from an afflux of humours, and bring on a lameness.

And, finally, in regard to those who are bandy-legg'd, to omit what Severinus has written at large (*p*) ; Ruysch (*q*) found, in an adult who was bandy-legg'd, the cavities of the upper part of the tibiæ, which lie beneath these cartilages, not equally depress'd to receive the condyles of the femur ; and, consequently, both those bones situated in a different manner from their natural disposition : which circumstances will better appear from the figure (*r*) than from the description.

For I have taken notice of these things, that you may be more fully inform'd, from the books of those that I have quoted ; and may learn from thence the signs by which you may distinguish them, and how and when you may undertake the cure ; and, on the contrary, when the time is past in which it was in your power to be of service.

Nevertheless, in some of those instances which have been mention'd, and particularly in the fracture of the patella, and the rupture of the tendons that extend the leg, a length of time is of more use sometimes, than we could hope or expect : and this it happen'd to me to see, in two persons, some years ago.

The first was a tall and fat man, who leaping down, some years ago, from a chariot, and fracturing his right patella transversely, had applied to the art of surgery in vain ; till having sent for that most excellent professor of surgery in this college, Jerom Vandelli, on the twenty-second day after the accident, he brought the upper part of the rotula to the lower as much as he could ; so that the one might be distant from the other by a much less interval than before ; and confin'd them in that part by the help of bandages.

This interval was about a finger's breadth : and therein nature herself gradually generated something, whereby the parts of the rotula might be firmly connected to each other. The man, therefore, made use of that limb freely ; when happening to fall down upon the steps of a certain bridge at Venice, and bending that leg violently and strongly, he heard a noise as if of something being ruptur'd in the knee : and the fact was, that by this violence of flexion, whatever it was that had kept the parts of the rotula connected together was ruptur'd.

The surgeons, finding it in vain to attempt to bring the broken parts so nearly into conjunction, as they had been a little before, at length, endeavour'd to make the joint as firm as possible by applying an instrument to the knee, and strengthening it by means of the clay from the baths near Verona. And after a long space of time, the man, who had suffer'd great

(*m*) Obs. Aat. Chir. 3.

(*n*) Anat. du corps hum. tr. 5. ch. 17.

(*o*) Dec. 2. Obs. 5.

(*p*) De recond. Abscess. nat. l. 6. P. 2.

(*q*) Adværs. 2. cit. c. 6.

(*r*) Ibid. Tab. 1. Fig. 2.

pains from both falls, and could not at all use his limb, had gain'd so much advantage, that he makes use of it now, without any instrument, and without any trouble or uneasiness: and this, whether he stands, bends his knee, or walks; which he does with great expedition, being but slightly lame on that side.

In examining this knee with accuracy, I found the parts of the rotula, which were almost equal in size, disjoin'd from each other by a very considerable interval; and that much greater still when the knee was bent: for where the rotula ought to have been, there then appear'd a cavity, which was extended about two thumbs' breadths in length, and not less in width; being about a finger's breadth deep: so that we could perceive, by the touch, the condyles at the lower part of the femur, and the upper border of the tibia.

This gentleman was brought to me by the professor before-mention'd, that I might see the circumstances I have related: and he said that I might likewise, if I pleas'd, see the same things nearly, in a certain servant-man at Padua.

But the second of the patients of whom I spoke above, was a noble Venetian, whom I saw in conjunction with the professor before-mention'd; being desir'd to consult what method might to be made use of, to strengthen his knee. This gentleman, after two falls, by the first of which his rotula was said to have been broken transversely, and afterwards to have coalesc'd by the help of art; though it was certainly wholly drawn upwards by the second; now walk'd expeditiously, and in an upright posture, through even places, like other men, and without any support; but had not yet gain'd much ground in going up stairs; for though he could go up, he could not go up with equal expedition.

In this patient also, when he stood, in the very seat of the rotula, which had been drawn up from thence, as I have said, a cavity occur'd to the eye. And I did not doubt but the prominent sides of this cavity were, as in the former man also, the very large lateral parts of that aponeurosis, whereby the muscles, extending the leg, are inserted thereinto: and to these parts it seem'd, that whatever motions either of the patients perform'd without the rotula, were to be ascrib'd.

That is to say, it had happen'd to both of them, that the intermediate part of the aponeurosis was broken asunder, without any injury being done to the lateral parts: to the former of them, in that part where it envelopes the rotula, to which it very firmly adheres; but to the latter, as far as I saw, betwixt the rotula, and the tuberosity that is prominent in the tibia.

Nor do I think that this inferior part, which I know that others also have seen ruptur'd more than once, is made less liable to be easily broken, by the ligament which most authors suppose to be under it, going from the rotula to that tuberosity. I, at least, notwithstanding I have look'd for it very diligently, and frequently, in bodies, could never be so keen-sighted; as very clearly to distinguish any thing that differs from a tendinous nature, in the fibres of that aponeurosis; or any thing that could properly and strictly be call'd a ligament.

Wherefore, I am still of the same opinion with Vesalius (*s*), who expressly says, “ that the patella is join’d neither to the femur, nor to the tibia, otherwise than by the interposition of tendons: and that the patella has this in peculiar to itself, that it is not connected to any other bone by the help of ligaments.”

And I could wish that, as Weitbrecht (*t*) has profess’d to follow this very great anatomist in this place, he had also follow’d him more constantly. However, this is not the place to examine some passages in his otherwise excellent book, entitled, *Syndesmologia*, which relate, for the most part, to the too great facility in supposing ligaments; at other times, to dissensions that are not at all necessary; and, sometimes, to a silence that is rather unjust. Now let us go on with our purpose.

28. How far the bones of the leg, also, may be prejudicial to walking, and how far they may be the occasion of lameness, no one is ignorant; I mean, where the fracture of either of these bones is improperly cur’d, and particularly the fracture of that which is the chief of the two; I mean, of the tibia: from the diseases of which I said, just now, that men became bandy-legg’d likewise.

And although, by reason of the natural straitness of these bones, it is more easy to cure a fracture of them, in such a manner that the limb may not be unlike the other either in figure or in length, than that of a curv’d or inclin’d bone, such as the thigh-bone is; yet if the fracture is oblique, it very easily happens, that the limb becomes shorter, and sometimes distorted.

And for this reason, some of my countrymen, in my memory, have chosen rather to suffer what many formerly suffer’d (*u*); I mean, that their bones should be broken again, and put in a better direction; and I know that this has succeeded well with some: but, on the other hand, I know a physician here, not without erudition, who having permitted the bones of his leg, which were beginning to coalesce, to be broken again by the hands of the surgeon; brought on himself the most violent symptoms, and death.

You will, perhaps, ask me at what time fractur’d bones begin to coalesce, and at what time they come to a perfect consolidation with each other? But this, in my opinion, is a thing of such a nature, that, if we consider the mode of coalition, the time cannot certainly be defin’d. For consolidation; to set aside the consideration of gravid women, in whom we read not more than one example of a fracture being consolidated in that part, where we read many of its not being consolidated (*x*); for consolidation, I say, will not begin, or be perfected, so soon in diseas’d as in sound bodies; nor in sound and healthy bodies, in like manner, with equal celerity, in old men as in young men; or in all those who have not the same fracture, or are not treated with the same method of cure.

(*s*) De corp. hum. fabr. l. 1. c. 32.

(*x*) Eph. N. C. Dec. 1. A. 1. Obs. 25.

(*t*) Syndesmolog. S. 5. § 13. cum notula *m.* cum Scholio.

(*u*) Vid. Celsum de Medic. l. 8. c. 10.

prope fin.

Nor, indeed, does experience teach us otherwise, if we attend to the experiments which the celebrated Du Hamel (*y*) has made on brute animals. For in a diseas'd animal, he found the callus, on the fifteenth day from the fracture, not perfect, as in others, at an equal distance of time from the fracture; but equally imperfect as in another on the tenth day. These animals were both young pigeons: the bone was the same: and had been broken, replac'd, and tied up in exactly the same manner: for in those where it was very streightly tied up, either a gangrene, which Celsus (*z*) foretels from too tight a bandage, brought on death before the cartilaginous firmness of the callus could appear, as this was not observ'd in the others before the fourth day; or even on the eighth day (*a*), on which the callus began to be bony in others, there was not the least beginning of any callus: but every thing was in the same state as if the bone had been just then broken.

29. And all these experiments, as well as many others, that very experienc'd man explains, by accounting for the callus; not, as others do, from the bony fibres producing themselves, or from the bony juice which distils from these fibres, or from the blood which is effus'd and adheres to the fractur'd bones; but, according to his own observations, from the external or internal periosteum, becoming tumid and thicken'd at the place of the fracture; and changing its laminæ, first, into a cartilaginous, and, after that, into a bony firmness.

But in regard to this firmness of the callus; whether you should chuse to explain it according to the observations of Du Hamel, that I have commended; or whether you should chuse to explain it according to the observations of that ingenious man Dehtleefius (*b*), which well deserve notice; you will not doubt but we must think in the same manner of this, as we have said of the beginning and completion of the callus: I mean, that, according to the various conditions, which are mention'd, and others of that kind; to which the longer or shorter time, also, from that of its being completed must be added; the callus may be more or less compact, or, at least, more or less hard and firm.

And by these means, I think, that the opposite opinions of many very celebrated men are to be reconcil'd to each other. For there are some who assert that the callus is of the same firmness as any part whatever of the bone; and that even, if it be of a diameter, as it often is, larger than the bone, it is so much the stronger in proportion to its diameter being increas'd; and that this is prudently provided by nature, because the fractur'd bones, being very rarely replac'd according to their former direction, would otherwise be more subject to a new fracture in that part; and might coalesce with difficulty in the same place again, because the callus is destitute of a vascular structure.

To lay aside which opinion, (not only because, according to the observations of Du Hamel, the callus does not seem to be deducible from bone,

(*y*) Memoir. de l'Acad. R. des Sc. A.
1741. Mem. 1.
(*z*) C. 10. cit. S. 1.

(*a*) Mem. 2.

(*b*) Dissert. exhib. ossium calli generationem, &c.

nor from callus, but from the periosteum, as we have said; but also because a surgeon of some eminence affirms, that, when the former callus is broken, a second is form'd sooner than the former) and to attend to this one thing, that the callus is said to be not less resisting and firm, at least, than the bone itself; there are certainly many other grave men, who advance things which do not at all agree therewith.

For see how Celsus (*c*); in order to lessen the too great quantity of callus, which is form'd upon bones that are rightly glutinated to each other; applies such things to the limb, as, if the callus were of a bony hardness, could be of no effect; as, for instance, long and gentle frictions of oil, salt, and nitre: various fomentations of warm salt-water, digestive malagmas, and tighter bandages.

Or if you do not think that these things were useful; you will read Du Hamel (*d*) asserting, that a dripping of water was not only frequently useful for that purpose; but also that, where there had been too free a use of it, it had soften'd the callus to such a degree sometimes, that the two extremities of the bone, which had coalesc'd with one another, were spontaneously disjoin'd again.

But whether these calli were either not of a very large diameter, or were very recently form'd, as that of two months growth, and but little prominent, in the leg of a young lamb, which was uncemented by being put into a pretty acrid lixivium, during the ebullition, as mention'd by the same Du Hamel (*e*); at least, those two, which the Sepulchretum (*f*) describes from Rolinc, in the thigh-bones of a certain dead body, were of a very considerable and monstrous bulk and diameter, and not at all recent, as appears from the relation: yet in this body, "when boil'd after dissection, in order to reduce it to the structure of a skeleton, both of these calli were mutually and totally separated."

And that observation which was communicated to Salzmann (*g*), by an eminent surgeon, deserves particular mention in this place. A soldier had been cur'd of a fracture of the tibia, by means of so firm a callus, that he could walk and bear upon the limb which had been fractur'd, as well as upon the other, and without the least inconveniency of any kind; when happening to be seiz'd, eight months after, with an acute fever, and being brought into the same hospital wherein he had lain before with the fracture, it was observ'd, that while the fever was counteracted by the usual course of remedies, the extremities of the bone were again spontaneously disjoin'd; the callus being gradually consum'd, as it were, by the febrile heat: and although these extremities could not be re-agglutinated, during the continuance of the fever; yet, soon after, when the fever was remov'd, the tibia was restor'd to its former state of soundness by nature itself, without any great apparatus either of remedies, or of bandages.

Finally, the compages of the callus itself, when examin'd in dead bodies, is sometimes of such a nature, that, notwithstanding its diameter is found to

(*c*) In fine c. 10. paulo ante cit.

(*d*) Mem. 2. cit.

(*e*) Ibid.

(*f*) Sect. hac 5. Obs. 1. § 8.

(*g*) Dissert. de Artic. Analog. &c. c. 2. § 7.

be much larger than that of the bone to which it has grown, it is far more fragile, nevertheless. Nor is it a substance of hard bone, but a spongy substance, such as is seen betwixt the two laminæ of the cranium.

A callus of this kind being describ'd, and represented in a plate, by Ruyfch (*b*), in the wing of a hen, and a duck; this author says, "That he
" had also observ'd the same thing in men sometimes: so that we must not
" give too much credit to those who suppose the callus of fractures to be
" always so exceedingly firm, that bones formerly broken, and glued together again, are, if they undergo a second fracture, sooner broken in any
" neighbouring part, than in the callus spoken of:" and he does not doubt but from thence it is, that some persons receive a fresh fracture from the slightest occasion, after the conglutination "of fractur'd bones:" and even merely by walking.

But if you wish for many examples of the structure observ'd in *calli*, and of the wonderful length that they sometimes have; you will, I believe, scarcely find them in a larger number, in any other authors, than in the learned Jo. Beniam. Boehmerus (*i*). Yet this number you may increase, I think, as far as relates to the structure, by the observation of that celebrated man Alexander Camerarius (*k*), on the thigh-bone of a child; and, in respect to the length, by the example given by Jo. Jacob. Bajerus (*l*), on the lower jaw of a miller; the callus being "about the size of three inches, " from the chin to the middle."

30. Now to return from the circumstances that happen to broken bones, not of the leg only, but to other bones also, and to come to the peculiar fractures of those bones; I will subjoin an observation, which contains a kind of rare circumstance besides.

31. A rustic old man, of a pretty fat habit, had fallen from a tree upon his feet, while he was pruning a vine; and had broken his right leg in such a manner, that the bones were prominent on the internal side, a little above the foot: and this through a wound which they themselves had made. These bones being replac'd in the best manner they could be, the man was carried into the city, and into the hospital, in the cold season of the year; for it was about the middle of February, in the year 1736. As he, therefore, was expos'd to the injuries and inclemencies of the weather also, he could not be sav'd; but was carried off within four days after the fracture.

Although the anatomical demonstrations, which I was then giving in the theatre, began to draw to a conclusion; I was not, however, willing to neglect the opportunity that was offer'd me, of examining the viscera of a body of this kind; and of inspecting the diseas'd limb. In which parts I observ'd the following preternatural appearances.

The abdomen; which was somewhat tumid the day after death, for no other reason, however, but because the air included in the intestines, made these somewhat tumid also; when it was cut into and laid open, shew'd the omentum to be so drawn upwards, as not to descend below the transverse

(*b*) Thef. Anat. 8. n. 49. & Tab. 3. Fig. 5.
& Catalog. Rarior. Theca B. Respos. 2. n. 2.
(*i*) Dissert. de Ossium Callo.

(*k*) Aët. N. C. Tom. 1. Obs. 53. vers. fin.
(*l*) Eph. N. C. Cent. 7. Obs. 4.

part of the colon, which it cover'd. The spleen was larger than usual, and easily to be lacerated.

The liver was pale, and in whatsoever part it was turn'd to the diaphragm, so closely connected therewith, that the membranes which invested both of these parts, did not seem to be two, but one only. The gall-bladder was oblong, and fat, although of a bright yellow colour externally; yet it contain'd bile that was of a yellow colour inclining to green, and fluid, but not *fæculent*: and contain'd, though in a man who had not been *icteric*, nineteen calculi.

All these were in the fundus, nor were any elsewhere, unless a very small one lay hid in a certain gland, betwixt the coats of the cyst, as a black point, which was seen through the coats, in one or two places of the internal surface, seem'd to prove. But those of which I had begun to speak, were all somewhat round in their figure, small in their size, black in their colour, and granulated on their surface, resembling nothing more than ripe mulberries.

These calculi being then thrown into water by me, they all of them immediately went to the bottom, and continued quiet there. But being presently taken out of the water, and laid on it after some days; not thrown upon it; they subsided somewhat more slowly, and emitted bubbles: and being laid upon the water, in the same manner, two months after likewise, they remain'd very long on the surface.

At which time, applying one that was dry to the flame of a candle, it did not catch the flame, but only sent forth some sparks, and the disagreeable odour of a burnt feather, and was withdrawn from the flame nearly in the same state it had been in before. However, some fragments of the others were become not at all softer by a two months maceration in water; and retain'd the same firmness always.

You may add these remarks to those which I formerly wrote to Schroeckius (*m*), upon cystic calculi.

But now take that circumstance which I said was very rare; at least I never saw it but in this body. The trunk of the inferior vena cava, where it became one by the junction of the iliac veins, did not occupy the right side of the lumbar vertebræ; as it always us'd to do; but occupied the left side, and went on to the left of the great artery, till, bending itself obliquely to the right side, over the anterior surface of this artery, immediately under the superior mesenteric, it return'd to its usual situation on the right side.

From this inflexion it happen'd, that, although the left emulgent vein open'd into the cava, two or three inches lower than the right emulgent, if you extended the cava into a strait line; yet the left kidney had not a much lower situation than the right. As I should have been surpriz'd at this passage of the vena cava, over the surface of the aorta, in any body whatever; I could not sufficiently admire the circumstance, in the body of a man who had grown old in the continual and hard labours of a country-life. However, the aorta had some little hardness at its division into the iliacs; and in like manner at the mouth of the superior mesenteric.

Upon opening the thorax, the lungs seem'd to be in a sound state, notwithstanding they every where adher'd to the pleura very closely; whether this membrane invested the chest, the sides, the back, or the diaphragm; nor was any disorder observ'd in the neighbouring heart.

Last of all, I examin'd the broken leg. It did not swell a great deal. The tibia, and fibula, were both broken, a little above that place where they are join'd to the foot; the fracture being continued longitudinally, but not in a direct line. Yet there was not a great quantity of blood extravasated thereabout: nor were the odour, and the colour, bad in their appearance.

32. I examin'd this fracture, not because in an adult man, and an old man too, I expected to see any thing, so soon, that related clearly to the incipient callus; but rather with a view to other things; and to this among the rest, whether, if any fragment had been disjoin'd from the bones, this was involv'd in a kind of mucous humour, as I had read in Valsalva's papers that he had found it to be involv'd.

There is also this remark in a certain letter of his, that relates to the present question: where a fracture happens to be complicated with a wound, the blood should be suffered to flow out; for by these means the bones and the flesh would be more easily join'd together: and it was for this reason, he says, that in the case of a broken thigh and tibia propos'd to him, the former had been consolidated sooner than the latter, because the fracture of the femur was join'd with a wound, by which the blood had been discharg'd; and the fracture of the latter was not.

And now that I have begun to remark these things, I will not omit that which was related to me by a surgeon of some eminence, in regard to himself. His leg being broken, and the bones being again replac'd, and properly dispos'd, he first observ'd, that, at the end of an hour after the surgeons had bound up the leg, his pain was encreas'd: and as they denied, upon examination, that this could be owing to the bandage becoming more tight in the mean time, he perceiv'd that it was owing to a stupe which they had laid around it, moisten'd with the white of an egg after being beaten up; and which, while it was growing dry, press'd some of the bony fragments to the sensible parts that lay around them.

And in the second place, he had observ'd, that while those who were about him walk'd too and fro in the room, the pain was encreas'd by the tremor of the room and the bed; and that his fear was always encreas'd, lest this tremor should be injurious to the conglutination of the bones.

And finally, when his fracture was perfectly cur'd, that he had an uneasiness and difficulty remaining in his heel for a very long time, when he attempted to walk; though he was a young man, and in other respects in good health: and that because sufficient care had not been taken, through the whole course of the long time, wherein he had kept his leg immoveable, to prevent his pressing upon the heel: and from hence you will learn why ingenious and attentive surgeons would have the heel of the fractur'd limb be laid quiet and easy in a foramen, form'd by the convolution of a stupe, or soft rag, into the form of a ring; so that the patient should not support the leg immediately upon the heel.

33. "That both bones of the leg are sometimes luxated near the foot," has been asserted long ago by Hippocrates (*n*): and that luxation would certainly make the limb shorter, if at any time they were so disjoin'd, that the astragalus ascended betwixt the two: yet that this cannot come to pass, unless, besides the most violent symptoms, the foot appears to be very evidently carried to the external side of the leg, is sufficiently demonstrated in a certain response of mine: and if you read this in the work of the celebrated physician who has publish'd it, you will, I imagine, perceive the case to be so clear, as not to think necessary that I should add any thing on this subject here.

34. Hitherto I have written so many things upon the lower limb, that unless we should choose to be very long, we must add only a few things of the upper limb, and of the vertebræ. A part of which, however, will belong to the lower limb likewise, as you perceive that part of what has been said may be transferr'd to other bones likewise. For in the number of these things also is that which I have taken notice of from Columbus (*o*), I mean that the epiphyses are easily separated from the bones in children. And he who does not attend to this, may be sometimes deceiv'd in them, by taking these separations for fractures.

I remember this to have happen'd to a surgeon, in other respects experienc'd; who, seeing both the arms of a noble boy tumid at the wrists, and perceiving, by examining with the hand, that, beneath a kind of fluctuating humour, the extreme parts of the radius and ulna were there become moveable; accus'd the woman that us'd to carry him, of suffering the child to have fallen out of her hands, and to have broken both its arms.

But as she constantly denied it, the parents, not knowing which of them they should believe, begg'd of me to hear the relation of the surgeon; and judge whether he might be deceiv'd or not. As they, during their conversation with me, had said that the child had labour'd, some little time before, under a very violent kind of small-pox, and this was confirm'd by the surgeon; see, said I to him, I beseech you, lest abscesses, which follow'd the small-pox, should have separated the epiphyses of these bones, by eroding the periosteum, whereby they were connected therewith: for Parey formerly saw this circumstance happen, not only from other internal causes, but in particular, "frequently from the small-pox;" and as that passage of Parey, which relates to this question, is transferr'd into the Sepulchretum also (*p*), I wonder how it should escape men, in other respects very learned, who have quoted surgeons of later date than Parey upon this subject.

You ask me the event of the case. It was just as I suspected; the surgeon himself ingenuously confessing soon after, that my admonitions were true; and thereby meriting the praise of an ingenuousness, which many others would not condescend to obtain, not only when I have suspected, but even demonstrated, their errors. However when the disease was known, the child was perfectly cur'd soon after.

(*n*) 1. de Fractur. n. 14. apud. Marinell.
(*o*) supra, n. 2.

(*p*) Sect. hac 5. Obs. 1. § 7. cum Schol.

Moreover, in regard to “the separation of the epiphyses, in consequence of the small pox,” as I know that some observations are extant even in a *Programma* (*q*), which has not yet come to my hands, I mean one of the celebrated *Weissius*; so I do not doubt but if any one were to write at this time, “of the relics of the small-pox,” he would not; as *Georgius Francus* (*r*), a man in other respects very learned, did formerly, on the same subject; omit the consideration of the separation of the epiphyses, which does not happen very rarely.

Yet nobody saw a greater number of epiphyses separated from the bones, in one season, from an internal cause, though of another nature, than *Poupart* (*s*), in that multitude of scorbutic patients, which crouded into the hospital at Paris, in the year 1699. For by reason of this disjunction it happen'd, that, if these patients were mov'd, the bones, and their epiphyses, were heard to rub against each other. Which observation is one of those, otherwise very few, observations, that are wanting in the medical treatise of the celebrated *Hertius*, *de Crepitu Ossium*; for he has diligently collected whatever else is extant in authors upon this subject, interspersing the observations of his father also now and then: although we want the light of dissections in determining the cause of this disorder, as happens in most persons.

But if we attend to the question, it seems that this cause ought more frequently to be plac'd, agreeably to the opinion of *Hertius*, in a kind of exsiccation, than a moisture and laxity.

Nor did it seem otherwise to me, when you consulted me for a matron of the first rank, who, at the end of her fifth time of child-bearing, began to perceive a kind of troublesome crackling of the bones in her knees, while she turn'd herself from one side to the other; and sometime after that in all the joints of both her upper limbs: yet in such a manner, that it was the most troublesome in her knees, in consequence of being join'd with a considerable pain in the extension of her legs.

For how could I deduce from laxity alone, that which was join'd with pain. As I therefore had recommended such remedies, both internally and externally, as would moderately moisten and relax tension; in the following year, when she consulted me again, there were no longer any complaints of that crackling of the bones, no more than if they had never existed; but as she had been wont before that, to be subject to very considerable hypochondriac affections, she complain'd of these only.

35. Whether the vertebræ are most easily broken, or luxated, is a controversy among the most eminent men, which I have taken notice of in a former letter (*t*). And, in regard to the uppermost of them, why; though I formerly did not want frequent opportunities of examining into this circumstance, in the bodies of hang'd persons; I did not examine into it, I have said in the same place.

(*q*) Vid. adnot. ab Hallero ad c. 4. P. 13.
Meth. Stud. Medic. Boerhaav.

(*r*) Eph. N. C. Dec. 3. A. 4. Obs. 1.

(*s*) Mem. de l'Acad. R. des Sc. A. 1699.

(*t*) Epist. 19. n. 14.

Since that time I have not had the opportunity. And in regard to the other vertebræ, though Valsalva and I have both of us inspected them, after the most violent blows, neither of us have found them luxated; but both have found them broken: as you have already learn'd from the fifty-fourth (*u*) and fifty-second (*x*) letters. Yet if two observations, on a subject like this, seem to you too few; add to them three of the celebrated Tabarranus (*y*); who, with his usual skill and diligence, has not only examin'd other things, but this in particular.

This author did not always find the vertebræ mov'd from their places: and when he found them mov'd at all, he did not see them to be so much mov'd from their places in general, as to allow him to believe they were luxated; but he always found them broken. Nor do I suppose that you will here propose to me the observations of our Vesslingius (*z*) and Pujati (*a*).

I very well remember that the former of these authors had seen some of the vertebræ of the back mov'd outwards, in a slight degree, in a certain woman, a native of Dalmatia; and in a man, a native of Padua, all the vertebræ of the loins remarkably inclin'd outwards, with a stupor of the inferior parts. So I also remember that the excellent Pujati had seen in others, and, what I bore with great displeasure, on account of the affection which I justly entertain'd for him, in himself also, the superior lumbar vertebræ prolaps'd outwardly; and not without torpors of the legs.

Yet I remember, at the same time, that both of them had ascrib'd those subluxations to internal causes, vitiating the ligaments. But the discourse that I have undertaken relates to those luxations which are said to happen from external violence, when the body and the ligaments are in a natural and healthy state: which I do not take upon me to deny; although, as particularly in the case of the celebrated Targioni (*b*), in whatever manner you endeavour to conceive of it, the explication thereof is very difficult; but I do not very well know, whether it is demonstrated by the dissection of dead bodies, that these luxations happen without a fracture of the vertebræ.

I have formerly read a history, which was said to be written by Bellini, of a mason, who, falling from an upper story of a house, and receiving a blow upon his loins, either in falling, or from the ground; began to lose the sense of feeling in his feet, and to discharge the contents of the intestines and bladder involuntarily, and to have the other symptoms that are describ'd.

As this man died after four days, the three uppermost vertebræ of the loins were found to be so luxated, as to be prominent a finger's breadth into the cavity of the belly; and therefore to compress the large trunks of the vessels in such a manner, as to bring their opposite parietes into mutual contact: from which it happen'd, among other things, that all the veins, from both the extremities of the feet quite to the luxation, were turgid with blood, and hard, just as if they had been stuff'd up by force.

(*u*) n. 26.

(*x*) n. 34.

(*y*) Observ. Anat. post n. 7.

(*z*) Epist. 25.

(*a*) Dec. Medic. Obs. 6. n. 10. & seqq.

(*b*) Semilussaz. delle vertebre lombari nella
I. Raccolta d' Osservaz. Med.

In this case who can doubt of the luxation of the vertebræ? We would rather doubt whether the external force, which could overcome the ligaments, had not broken the vertebræ? and whether this had not, perhaps, by breaking them, been equally injurious to the spinal marrow, and its appendix, with the luxation itself? But of these things, that is of inspecting the vertebræ with attention, and the medulla itself, among so many other circumstances that are describ'd, not the least mention is made.

Thus in the fourth book of the Sepulchretum, and in the third section of that book (*c*), an observation of Fontanus is extant (for the observation of Panarolus, of luxations, which is in this sixth section (*d*), relates to the superior vertebræ; nor is it sufficiently certain, as I have said elsewhere, whether the luxation was without a fracture; and even, as I shall show just now, whether it was a true luxation), in which observation of Fontanus, we read, indeed, that a porter who had fallen from a high place, with his back upon a piece of timber that lay beneath, had “dislocated and loosen’d” the *vertebræ dorsi*; in consequence of which his body was curv’d. and his face turn’d towards the ground as long as he liv’d.

But when his body was examin’d after death by dissection, and particularly his back, instead of knowing, as you would expect, whether those vertebræ were broken, or not, you are told nothing about this, but only that five vertebræ were seen to be “conglobated into a gypsum,” the viscid matter which adher’d to them “being converted thereto by a kind of natural inspissating heat.”

Nor do I know that there are other dissections in the Sepulchretum, besides these, that relate to the present subject: you now see therefore, whether it is with reason we wish that the question had been more frequently and diligently enquir’d into by our predecessors.

That observation of Fontanus may, at least, give room for a suspicion, whether those, or whether other vertebræ, may not be prominent sometimes; not from a luxation, but from a matter, which an external or internal cause may produce around them, and indurate; from whence not only the nerves, that arise therefrom, are press’d upon, but the adjacent muscles which are destin’d to the extension, or flexion, of the body, and even the vertebræ themselves, are impeded and disturb’d in their actions and uses.

And in proportion as the nerves shall be less hurt, or the life of the man protracted to a greater length of time, the greater room will be given for this suspicion, or any other of that kind: which, especially in an unusual affair, Panarolus ought to have remov’d, when he spoke of the second vertebra of the neck being luxated, and that “by a very great luxation” too; and nevertheless said that the man “had liv’d in this manner for a great number of “days:” for it was not enough to say that this “was observ’d from the dissection of the dead body;” but it ought to have been added, with accuracy, to what side the vertebra was luxated; and whether he had not found some of the ligaments, at least, to be ruptur’d from that violent fall, if not the vertebræ itself; or its dentoid process broken.

But, on the contrary, I commend the most excellent Trew (*e*), who, having said that he had seen the first vertebra of the loins “a little luxated” in a man, has not fail’d to say, that the body of the same vertebra “was divided quite through by a longitudinal fracture:” and has asserted that, in another man, “the body of the left vertebra but one, of the back,” was found, by him, “to be entirely pull’d away from its cartilage, at its conjunction with the last; and not only this, but also that it was ground into several little pieces at the same place.”

And I could wish that others, when they met with the fifth vertebra colli luxated to the left side, and the sixth to the right side, a great aperture being interpos’d betwixt both (*f*); or when they found the second vertebra of the neck “dislocated,” though not so much in a boy of seven years of age (*g*), as in a soldier (*h*); had taken time to enquire, accurately, whether there was any part broken in those vertebræ, but particularly in the second; and what part; or whether there was any rupture in the ligaments.

In saying of which I do not call into question the veracity either of Panarolus, or of any other person: I only require diligence when there is opportunity; and even expect it (*i*) from those who shall happen to light on such cases for the future.

36. But as to what I have said of the motion of the muscles which extend or bend the vertebræ, or of the vertebræ themselves being impeded; this is common to other bones that are join’d together by a moveable joint. For as to what relates to the muscles, you might have seen from our observation above (*k*), that the leg, for instance, was inflexible, by reason of too strong an action of the muscles which extended it; whereby the action of the flexor muscles was impeded.

And, on the other hand, you will perceive, from the observation and monitum of Caspar Hoffmann (*l*), that the leg sometimes cannot be extended, in consequence of being prevented by the opposite muscles; which, by reason of the negligence of the surgeons, and their very streight bandages, are at length dried up, in the ham, into a hard knot. And that, when the muscles are not impeded in their action, the motion of the bones themselves is impeded for this reason, that though they should be no more than one in number, they are become one; you have examples in this sixth section of the Sepulchretum (*m*): and not only in the knee, but also in the elbow; and even in all the joints of the body of an old man, from the head quite to the extremities of the toes.

In this old man the vertebræ had coalesc’d with each other, as well as the rest of the bones; but in other old men, this coalition was peculiar to the vertebræ, from the observation of Paawius (*n*). So, long before him, it had

(*e*) Aët. N. C. Tom. 2. Obs. 51.

(*f*) Commerc. Litter. A. 1738. Hebd. 40. II.

(*g*) A. 1734. Hebd. 11. post n. 6.

(*h*) A. 1740. Hebd. 52. n. 3.

(*i*) Vid. infra, n. 37.

(*k*) n. 26.

(*l*) Comment. in Gal. de Usu Part. in fin. 1. 3.

(*m*) Obs. 3. §. 3. & Obs. 4. §. 3. & 2.

(*n*) Ibid. §. 1.

been seen in the vertebræ of the loins, in particular, by Cattus (*o*): and our Falloppius (*p*) has said, that the vertebræ, “ which produce a gibbosity, are “ so connected together in process of time, as to become quite one vertebra, “ and leave no trace of any joint.”

But I do not so much wonder, that those observations have not been added to the Sepulchretum, as that the more surprizing, and more known, observations of Ruysch (*q*) have not been added: for Ruysch not only observ'd the same thing in gibbous bodies, but this also “ many times;” that the bodies of the vertebræ, which had been curv'd forwards, were so compacted into one substance, that some of these bodies seem'd to have been annihilated; and sometimes four, or seven, bodies of this kind of vertebræ made into one bone, so as scarcely to equal the body of one vertebra.

After these, I purposely omit other observations, especially those that I have referr'd to elsewhere (*r*), together with those of Ruysch, though in a brief manner, of the vertebræ being join'd into one, both from the ancients and moderns; not to speak of my own, as I saw five vertebræ lumborum join'd together thus, that were found in the burying-ground of this hospital, and preserv'd by our Mediavia. For I suppose that what has been hitherto said of fractures of the bones, luxations, and other disorders injurious to motion, will seem to you to be quite sufficient. Farewel.

37. Thus far had I written, when, among the many dissertations which that illustrious man Albertus Haller lately sent to me with great kindness, and according to his custom, I read, with great pleasure, one relating to what I have just now touch'd upon in regard to the luxation of the vertebræ, publish'd at Tubingen by the celebrated professor Mauchart, in the year 1747.

In this dissertation, that very ingenious man inquires into the luxation of the neck; and, in the first place (*s*), says, that there was “ not even the “ shadow of a luxation,” in the vertebræ of the neck of any one of all the bodies which he had dissected, after their being publicly hang'd, notwithstanding the executioners had very violently, and for a long time together, press'd their heads forwards: and he declares below (*t*); which I would have you compare with what we have said in the nineteenth letter (*u*); that in two young men, one of whom he dissected, and the other the celebrated professor Weissius, that the muscles had been lacerated by the halter; in the first, the sterno-thyroidæi, not to mention the sterno-hyoidæi; and, in the second, these and the sterno-mastoidæi; and, in the same body, that the cricoid cartilage was broken into many little pieces; and the trunk of the aspera arteria entirely torn away from the larynx.

But as to what relates to other external violences; as, for instance, to blows, falls, and such-like accidents; he denies that there is extant any certain and accurate observation of a luxation of the first vertebra, from the

(*o*) Isagog. Anat. c. 3.

(*p*) Præfat. ad Tract. de Lux. & Fract. Ossib.

(*q*) Obs. Anat. Chir. 67.

(*r*) Epist. 27. n. 32.

(*s*) § 5.

(*t*) § 16.

(*u*) N. 8. & 13.

(*x*) § 9. & 11.

head, as far as he knew: though he had turn'd over more than fifty celebrated writers of surgery, and chirurgical observations.

And of the receding of the second vertebra from the first, and of the fourth from the fifth, he produces, in all, two examples (*y*), which well deserve reading; as many *monita* also do, that relate to luxations of these vertebræ; as, for instance, that they are deceiv'd (*z*), who do not doubt but the second vertebra is luxated from the first, when the point of the finger may be inserted betwixt both; as if, in fact, this could not happen naturally: and that so much the more, if the ligaments, which lie betwixt, have suffer'd any considerable violence in extension: and, in like manner (*a*), that the second vertebra cannot be luxated forwards, unless by a surprisngly great, and almost incredible impetus, the very strong ligaments of the dentoid process be ruptur'd, or the process itself broken.

I omit other things: for you very well perceive, even from what has been already said, whether it is with justice that I have complain'd (*b*) of many things being omitted by Panarolus, in his description of a luxation of the same vertebra.

And, certainly, if you suppose that the first vertebra cannot be luxated from the head; it must, of course, be an obstacle to the tooth-like process of the second vertebra, either by its anterior bony arch, which prevents it from being carried forwards, or by its very firm transverse ligament, which prevents it from being carried backwards, with the second vertebra when impell'd, so that this vertebra shall be luxated; unless either the ligaments are ruptur'd, or the dentoid process itself broken: and you see it will happen nearly in the same manner, when you observe what lies in the way of the tooth-like process laterally, if you should chuse to suppose this vertebra to be luxated to either side.

For my discourse was of true luxations of this kind. Of which kind I could wish that they had been in the two examples of Mauchart: for although he says, that he could introduce his thumb betwixt vertebra and vertebra; yet, in the first, he even expressly denies (*c*) that there was "a true luxa-
"tion." And I even wish that the first example had been from his own observation, and not from the observation of a certain neighbouring physician; for in that case mention would have been made of the ligaments being ruptur'd, or of the bone being fractur'd, or not fractur'd: which deficiency is not in the second; yet if, instead of being merely present, he had perform'd the dissection in this, there would have been no doubt whether the ligaments had been lacerated by the violence of the fall, or by the knife: and the vertebræ being examin'd very accurately, both internally and externally, it would have been now much more certain, that there was no fracture of the bones.

For which reason it is to be wish'd, from him in particular; both in regard to those vertebræ, and all of them; that according to the occasions which may present themselves for the future, this controversy may be totally deter-

(*y*) § 11. & 12.

(*z*) 15.

(*a*) § 10.

(*b*) *Supra*, n. 35.

(*c*) § 16. in fin.

min'd ; and the anatomical doctrine of the ligaments may at the same time be completed ; wherein, not only I have observ'd that some things still remain to be treated of, more accurately, after Weitbrecht ; but Mauchart, by that peculiar skill and accuracy which he is remarkable for in dissection, really shews, in the dissertation entitled " The Articulation of the Head with " the first and second vertebra."

And these few things I was willing to say, by way of postscript to this letter ; lest, because the copies of that other dissertation, subsequent to what I just now mention'd, are very scarce in Italy, you should be ignorant what so great a man has thought, or seen, in regard to the luxation of the upper vertebræ. Once more farewell.

LETTER the FIFTY-SEVENTH

Treats of the Gout, and other Pains of the Joints.

I. **I** HOPE you will not be greatly surpriz'd at my not treating, here, of the impediments to lying down on the back, or the sides ; and producing very few observations that relate to the gout ; when you have consider'd the two next sections of the Sepulchretum, and the thing itself. For as to patients not being able to lie in a supine posture, or on their sides ; this generally happens from diseases, on which you have often receiv'd other letters from me, that take no less notice of the troublesome symptoms, or inconveniencies, wherewith those diseases are join'd, than of the diseases themselves.

For this reason, the seventh section also, that is allotted to the treating of these impediments, in the Sepulchretum, is very short : not because histories are wanting which relate to the subject, but because almost all of them, having been already produc'd, each in its proper place, are refer'd to here in three words, by pointing out the place where they may be read at pleasure ; in the same manner as the sixteenth, the twentieth, the twenty-first, the twenty-second, and the thirty-eighth letters, may be pointed out to you by me, in preference to other letters.

As the gout is generally a disorder of the rich, and very seldom of the poor ; and the carcases of the latter, not of the former, are deliver'd to anatomists ; or as, if at any time the bodies of the rich are to be open'd, the viscera only are subjected to examination, for the most part, and scarcely ever the limbs ; it happens from hence, that observations which properly relate

relate to the gout, are far more rare in the books of anatomists, than those of a great number of other diseases.

For this reason it is, that but few could be transferr'd into this eighth section of the Sepulchretum, that treats of the gout; which section, therefore, is, for the most part, made up of scholia: and out of those few observations which it does contain, some had been already produc'd in the preceding books; and you will find, that the last which is added had been already propos'd by Bonetus himself a little before, in that same section; and what is still more, even in the immediately-foregoing page; and in so many words; if you compare it with the eleventh observation, and its scholium.

I, however, am still resolv'd to repeat no history, though I might take occasion to repeat many from Valsalva's, and from my own. When it becomes necessary to bring back to your memory any of these observations, I will point out the letters in which you may read them. Here you will have very few indeed; but then they will be what I have not sent you on any former occasion.

2. A woman was frequently afflicted with ischiadic pains, at the joint of the femur, on the right side; on which side she was lame, and somewhat gibbous. At length, she was first seiz'd with a palsy, and after that with an apoplexy; which carried her off before the end of January, in the year 1741, at the time I was reading anatomy in the college: to which place the body was carried from the hospital.

The belly being open'd, the omentum appear'd to be stretch'd down almost to the pubes. And in attempting to turn this up, we turn'd up, at the same time, the intestine colon, which was curv'd towards the lower part of the belly, and adher'd closely to the omentum. That is to say, the seat of this intestine was different from what it generally is. For, besides that the beginning of it, as well as the cæcum, was lower in the belly than it generally is; when it had ascended from that beginning, almost quite to the liver, it was reflected downwards from thence, into the upper part of the hypogastrium, in the form of an arch; and ascended upwards from hence, very high, by a curvature quite similar, into the left hypochondrium: and in the whole of this arch, as has been already said, it was firmly tied to the omentum.

Both of the Falloppian tubes were shut up at their uterine orifices. The osculum uteri was not surrounded by any corona on the back part. The vagina was short. The space from the glans clitoridis, also, to the orifice of the urethra, was short; so as not to be equal to the breadth of a little finger. The trunk of the great artery, which is in the belly, sent out the superior mesenteric artery of a larger size than the cæliac: and was distinguish'd in several places internally by whitish spots. The other vessels we did not examine; these parts being replac'd by better from other bodies; and we fearing lest our confinement, as to time, should prevent us from examining the head.

I have already told you, on a former occasion (a), what kind of thyroid

(a) Epist. 50. n. 31.

gland I met with in going on to the muscles of the neck, the remaining part of the trunk, and the limbs: and what kind of joint of the right os femoris, with the acetabulum, I found, I must now tell you; agreeably to my promise in the preceding letter (*b*); only first making this remark, that the bony sinus, wherein the right scapula receiv'd the head of the os humeri, had its edge manifestly deficient, where it should have approach'd, with its anterior side, to the upper part.

The head of the right os femoris was not rounded into a globular form: and was depress'd, and not cover'd by a smooth and white cartilage, but by one of a pale ash-colour: and, indeed, this cartilage was totally deficient in the posterior part of the head; so that the bone appear'd naked in that part, and form'd into many roundish and protuberant particles.

The internal surface of the acetabulum was bloody: and the supercilium thereof, as it is call'd, had two bony laminæ buried within its natural cartilaginous and ligamentous substance; which laminæ were not small, and lay near to each other.

3. Fernelius (*c*), indeed, judg'd that an arthritic humour "never, or very seldom," penetrates into the cavity of the joints, but only falls upon the surrounding ligaments, membranes, and tendons; making use of this argument, amongst others, that in the tophaceous podagra, or chiragra, the humour, which is already concreted into a calculus, is, for the most part, taken out from the joints of the fingers, or toes, the capsular "ligament being sound and unhurt."

But others, afterwards, as you will learn from the Sepulchretum (*d*), seem to have attempted something more than Fernelius; since they endeavour to prove, that even the tendons, which are inserted into the joints, have either "no sensation at all, or a very obscure one:" and that this gypseous matter is indeed, at length, collected near the joints, by reason of other additional causes, but not always; as it is met with in other neighbouring parts. In the woman in question, however, who was so tortur'd with ischiadic pains, I found no disorder near the joint; but all of it within the joint.

Yet we do not deny that this tartareous matter concretes, also, near to the joints; as in that priest in whom Valsalva (*e*) found it immediately under the skin, in the membrane that enwraps the tendons of the fingers. Nor shall I make any objection, if they should chuse to understand the words of Aretæus (*f*) in the same manner: "In the joints, also, tophaceous bodies are form'd: in the beginning they appear like abscesses: but afterwards they are more inspissated, and when the humour is concreted, it is even difficult to bend the joint: at length, they become white and solid tophi."

And I will even refer you to the observations of our Sanctorius (*g*). His words are as follow: "I have sometimes seen, that in a certain old knee-gout, a gypseous pituita, similar to a liquid lime, had flow'd down to the skin; upon the perforation of which it was discharg'd in that liquid state:

(*b*) Epist. 56. n. 16.

(*c*) Patholog. l. 6. c. 18.

(*d*) Sect. hac 8. in Schol. ad Obs. 1.

(*e*) Epist. 40. n. 2.

(*f*) De sign. & caus. diuturn. morb. l. 2.

c. 12.

(*g*) Comment. in 1. F. 1. l. Can. Avic.

D. 4. c. 1. t. 1.

“ stirr’d up by which experiment, I once made use, in the case of a knee-
 “ gout from a gypseous pituita, of the dripping of water from unwash’d
 “ wool, in which mallows, cresses, and other herbs of the emollient kind,
 “ had been boil’d; and, after a long interval, I made some portion of that
 “ gypseous pituita, which lay under the skin, liquid and soft; and evacuated
 “ it from thence, by cutting into the skin.”

This curative experiment I was not willing to omit here; although it did not escape me (*b*), that the calcarious matter of gouty joints had been “ re-
 “ solv’d by warm water alone,” but when taken out of the body, as I suppose; and that from thence hopes were conceiv’d, that by means of frequent draughts of lime-water, to which soap is added, it would happen that this matter should be dissolv’d in the very joints of gouty bodies: and I could wish this hope might have been more just, if the success could prove, that as great a quantity of this water was carried into the joints, as was carried into the bladder.

We therefore grant to those, whom we have referr’d to in the Sepulchretum, that near the joints also, and that not uncommonly, a tophaceous matter is collected. And I moreover even add, that it is sometimes collected far from the joints; as we have seen in a tumour of the breast of a gentleman (*i*), whose grandfather and father had been afflicted much with the gout, he himself not having been wholly free therefrom.

But we cannot, for this reason also, approve what they assert: that as the capsular ligaments shut up the cavities of the joints, and as “ no passage lies
 “ open ” thereto, nor any vein enters these places, the gouty humour cannot be carried within them. For there is the same passage, into these cavities, for this humour, as for the mucilage that lubricates the cavities: and that the glands which secrete this humour, are furnish’d with their little arteries, is not only demonstrated by reason, or injections; but even by the eyes themselves, when unfurnish’d with glasses, and looking upon those reddish and slender flaps of these glands. Wherefore, when the blood is loaded with tartareous particles, these particles may be deposited in the cavities of the joints, by means of these same vessels, together with the mucilage; as well as by means of other arteries about the tendons, and membranes, which lie adjacent to the joints.

And these particles concreting into tophi, and little stones, by gradually drawing asunder the bones, and by dissolving the ligaments, “ break the
 “ joints,” as Persius (*k*) says of “ the stony chiragra;” or as Cælius Aurelianus (*l*) says of these gouty “ stones, they loosen the joints, and distend the
 “ skin, and by bursting forth become prominent, and are taken out by
 “ the hands of the surgeon:” all which circumstances I have seen, and particularly in the joints of the fingers of a certain Venetian nobleman.

Nor will you have any room left to doubt, whether they are really form’d within the very cavities of the joints, when you read the observations re-

(*b*) Vid. § 11. Dissert. cit. Epist. 42.
 n. 19.

(*i*) Epist. 50. n. 45, 46.

(*k*) Sat. 5. v. 59.

(*l*) Morb. Chron. l. 5. c. 2.

counted in the Sepulchretum, from Harderus (*m*), Schneider (*n*), and Dobrzensky (*o*).

4. Yet it is not always necessary, that the tartareous particles should enter the cavities of the joints, together with the mucilage, in order that arthritic affections may be there produc'd. It is sufficient, if you attend to Boerhaave (*p*) on this head, that the mucilage itself, if not attenuated by a proper attrition, and for that reason not absorb'd, " stagnates a considerable time " in the joints, " and becomes acrid by this very stagnation." For by this means it produces the most violent pains: and " frequently these very great " disorders arise merely from a sedentary kind of life."

And to this other things ought to be added, which we reckon among the causes either of diminish'd attrition, or of difficult absorption, or of both; I mean moist cold, which injures the natural tone of the joints in a great degree, and that so much the more easily, because the cartilages and the ligaments, of which they are compos'd, and the tendons wherewith they are most of them cover'd, are not furnish'd with a great number of sanguiferous vessels, if compar'd with most other parts; and these vessels are certainly very small; for which reason it happens that they are more subject to cold; and especially in those joints which are very much expos'd to the injuries of the cold, as in the feet.

We must likewise add pressure; as, for instance, from tight shoes, from whence many of the resorbent vessels are either made too narrow, or quite obliterated: and this so much the more easily, as they are press'd against the very hard parts of which I have said that the joints consist.

Other causes are, the distance from the heart, from whence the impulse in propelling the humours is very languid: the easy and perpendicular passage through which the same humours are to be carried: the indulgence us'd during the pains of the affected parts, in which delicate patients remain even much longer than there is occasion: a lentescent and viscid state of the mucus, either from morbid causes, and in particular from gluttony, drinking, or venery, or from any parental taint; whereby the absorbing vessels are also streighten'd, and there is a weakness of the propelling fibres: and other circumstances of the like kind.

A great number of which I have enumerated, because I have observ'd that some persons in describing them from Hoffman (*q*), (in whose works almost all these circumstances are taken notice of) without making any mention of this author, have omitted some things that ought not to be pass'd over; whether we undertake to explain nothing else but what Hoffman has done, that is to say, why the feet are, more frequently than other parts, seiz'd with the gout; or even why, and that in the beginning also, some other part is seiz'd therewith.

For in fact; as is said by Cælius Aurelianus (*r*); " the arthritic pain " takes its beginning from the feet sometimes, and spreads to the other

(*m*) Sect. hac 8. post. Obs. 2.

(*n*) Obs. 3.

(*o*) Obs. 5.

(*p*) Prælect. ad Inst. § 258.

(*q*) Medic. Rat. Tom. 4. P. 2. S. 2. c. 11.
Thes. Pathol. § 16.

(*r*) c. 2. paulo ante cit.

“ joints; and sometimes beginning in the other joints, attacks the feet afterwards.” And those joints which are not only in more frequent motion than others, but, at the same time, subject to fewer of those causes that I have enumerated, scarcely ever, or never, are seiz’d with the gout: nor do I remember ever to have heard, or read, that those joints were thus affected, whose obsolete memory I have endeavour’d to restore, by shewing that there was no part deficient in them, by reason of their smallness, that was given to the larger joints; for we have evidently demonstrated (s) those very small joints, that are interpos’d betwixt the cricoid and arytenoid cartilages, to be supplied with a membranous capsular ligament, with the flap of a mucilaginous gland, and with mucilage.

But those joints are chiefly affected by adventitious morbid causes, which are subject to most of those other causes that I have mention’d; I mean the joints of the feet: wherefore, when ancient authors (t) saw an epidemical gout, so that eunuchs also, women, boys, and girls, and flocks of goats, in like manner, were affected therewith; it was that foot-gout which attack’d the inhabitants of the place promiscuously, for twenty years together.

But it was less surprizing that two illustrious young men of fifteen years of age, who began to labour under the gout, should have been known to Brasavolus (u); as I myself have seen little children, who were seiz’d with severe pains of the joints, and greatly disorder’d thereby, before they had well got out of their infant-state: and have, at the same time, known that their father, grand-father, and great-grand-father, had been subject to the gout.

5. And how acrid the mucilage of the joints sometimes becomes, by stagnating in their cavities, is sufficiently argued, I think, from the bloody appearance of the acetabulum of the woman in question (x), and from the erosion of the head of the femur. But when the acrimony has come to this pitch, do you think it possible that the hip-gout may be cur’d by any internal or external remedy?

I certainly do not think it is: not even if you make use of “ the last and most efficacious remedy in inveterate disorders;” for thus, I believe, we ought to read the words of Celsus (y); “ by ulcerating the skin, in three or four places, upon the hip, by means of red-hot irons;” not to mention other and milder kinds of cauteries besides, that were us’d by Hippocrates (z), such, and many more, as are taken notice of by Cælius Aurelianus (a); among which is this also, that was likewise us’d by Hippocrates, and which seems, more than any other, to have corresponded to the *moxa* of the Indians, I mean a kind of fungus that was set fire to at the upper part: all which kinds of burning Cælius; although he acknowledges them to be “ moderate by their gentle penetration;” nevertheless postpones to other remedies, on account of being attended with a great deal of uneasiness,

(s) Advers. Anat. 1. n. 15.

(y) De Medic. 1. 4. c. 22. Vid. Epist. 6:

(t) Vid. apud Donat. de Medic. Hist. Mir. 1. 1. c. 8.

nostram in Cels.

(u) Vid. ibid.

(z) Vid. apud le Clerc. Hist. de la Medic. P. 1. l. 3. c. 28.

(x) n. 2,

(a) 1. cit. 5. c. 1.

and forbidding the use of those remedies, “ as the ulcerated parts cannot bear the application of them.”

But burning, in order to contract and corroborate relax'd parts, has its use; and ulceration of the skin, in order to carry off, and eliminate, from the internal parts of the body, some portion of the morbid matter which has fallen thereupon, has its use also: wherefore you will not think a mild burning of this kind, and timely applied, a remedy entirely to be rejected in some cases; especially when you call to mind, not only the cures of the ancients, but also some more modern cures, that have been successfully perform'd thereby.

You will think much the same of some other remedies. “ So great,” says Arantius (*b*), “ is the efficacy of glysters, in the hip-gout, especially “ when incipient, that I have restor'd many, who were grievously affected “ therewith, to their former health, without the application of any other remedy besides these.” And the first glysters which he proposes you will, without doubt, readily approve, as they do not greatly differ from those that Cælius (*c*), who has been so often mention'd by us, recommends; “ whereby “ the internal parts, being fomented and moisten'd with vapour, consent in “ a universal relaxation.”

But where those first glysters have not been sufficient, Arantius prescribes another kind, and that, as he himself acknowledges, a strong purging clyster. Will you then reject them all entirely through fear of irritation? Nay, where there are those causes and those bodies that he supposes, you will make use of some other kind of glyster, if you do not make use of that, whereby to obtain the same purpose.

And certainly, if you read the more ancient, or more modern, physicians than Arantius, you will find that there are many testimonies which agree with his. Thus Montagnana (*d*) says, that ischiadic pains, “ by the testimony of many of all prudent physicians, are cur'd by acrid glysters.” And Riverius (*e*), after other clysters being frequently applied, at length proposes acrid ones also; so that you may perceive him to be very manifestly of the same opinion with Arantius.

Moreover Etmuller (*f*); to omit others; not only says that clysters are suitable, and particularly when repeated; but adds this: “ and it is necessary that they should be acrid.” Who then dare suspect, that what so many very experienc'd professors so greatly recommend, has not answer'd sometimes with them? This remedy therefore has sometimes its use.

But at other times there is room for those glysters which Cælius approv'd; or others that act in a different manner; among which I know that those have sometimes been of advantage, that have been prepar'd from water wherein the *os pernæ* had been boil'd: even more than glysters made up of elaborate pharmaceutical preparations, not to say of preparations equally cheap.

(*b*) l. de Tumor. p. n. c. p. 63.

(*c*) c. 1. cit.

(*d*) Confil. 257.

(*e*) Prax. Medic. l. 16. c. 2.

(*f*) Prax. l. 2. S. 2. c. 3. art. 8.

Yet I should suppose that some of them were compos'd of such things as were useful to the nerves, that lie near to the *intestinum rectum*; which, descending behind the *os ischium*, some consider'd as the seat of the ischiadic pain: especially from the time Coiterus (*g*) had said, that, he had found the space betwixt the lower part of the spinal marrow, and its *dura mater*, through which those nerves are carried, to be “ frequently fill'd with a thin “ serum, in arthritic, ischiadic, and podagric patients; and sometimes with “ a viscid pituita.” And this observation is transferr'd into the *Sepulchretum* (*h*), though not quite in the words of Arnisæus, who takes notice of it; yet this I am the more careless about, because a fluid of the same kind is found in those also, who have not labour'd under a disorder of this nature.

6. And I must think the same of purging medicines, and of blood-letting, as I have thought of glysters. For as to what relates to blood-letting, to say nothing of the opinion of those, we suppose that the ischiadic gout is from a vain effort of nature, in attempting to expel the superfluous blood, by the way of the hæmorrhoidal vessels; certainly the more ancient authors have led the way to the observations of those persons: among which more ancient authors is Joannes Zecchius (*i*), who has said, in dependance upon reason and experience, that blood taken from those veins “ is, in “ a surprizing manner, serviceable to ischiadic patients.”

The same author relates still more surprizing things of the very speedy solution of this disorder, if the vein which lies upon the external ankle, on the same side, be open'd: and this is confirm'd by an almost similar observation of Riverius (*k*). Who will deny that these authors had seen what they say they had seen? But would you attempt that in a very weak constitution, and one that has but little blood, which it is natural to suppose had succeeded with them in a robust and full habit; or in one that had become ischiadic from a suppression of the hæmorrhoidal flux?

I also know that you would not give purging medicines to an arthritic patient whose body is extenuated, and strength decreas'd; or whose nerves may be easily drawn into consent: or, finally, to one whose stomach is of such a nature, as easily to be injur'd therefrom.

Yet I do not suppose you therefore think, that every purging medicine is, at all times, and in all constitutions, injurious. For if this were the case, most of the more ancient physicians would never have prevented, or got rid of, the gout, even when it was incipient; as they assert that they had gain'd both these points, by the use of purging medicines in particular.

I am prevented from mentioning each of them separately, by their follower, Demetrius Pepagomenus, physician to Michael Palæologus; who, by the command of his master, wrote a little book on the gout, which has been printed at Padua in my memory, as the work “ of an uncertain author,” and not to be had separately from large volumes: whereas; to say nothing of the more ancient edition; it had been publish'd separately at Paris, in the year 1558, and not without the name of the true author; as also at

(*g*) *Observ. Anat.*

(*h*) *Secl. hac 3. Obs. 6.*

(*i*) *Consult. Med. 43.*

(*k*) *Cent. 2. Obs. Med. 25.*

St. Omers, in the year 1619, Joannes Bergesius publisher; who, I suppose, would not have given himself the trouble to turn the French version of Jamot into Latin, if he had not been ignorant of its being publish'd in Greek and Latin at Paris, and of its being elegantly translated into Latin by Marcus Mufurus.

If you therefore turn over this book, even hastily, you will immediately see how much this Greek physician, as a follower of those ancient Greek physicians, attributed to purging remedies, in curing, and preventing, the gout.

But lest you should imagine this to have succeeded in the country of Greece only, and object to me that a physician of great note, in our time, asserts every kind of purging, even “by means of lenient medicines;” not to speak of stronger remedies; to be for the most part injurious to gouty patients; whether you mean to cure the present paroxysm, or prevent a future one: and that even he had found it, by experiments made upon himself, as well as upon others, so little to answer his wishes, “that it invited “and increas’d the very evil which it was expected to prevent, and to cure;” lest then, I say, you should object these things to me; I will oppose to you two physicians among our countrymen, who were very famous when living; who were themselves gouty, and had tried purging on themselves; I mean Marcus Gatinaria and Petrus Bayrus.

The former of these gentlemen (*l*) having made use of evacuation every month, for the space of two years, and made use of reduction by abstinence twice a week, says, by these means “I certainly was cur’d, and have never “been afflicted with the gout since.” And Bayrus (*m*) having already labour’d eight or ten times under the most violent pains in all his joints, so as not to be capable of moving any other part besides his tongue; and being again afflicted therewith; could, upon taking his own electuarium caryocostinum, walk on the same day, and the day after was free from disorder: and this experiment he made twice afterwards with the same success.

And in fine, after having made use of the same medicine three or four times a year, whenever he began to perceive any signs of plenitude, he says, “it is now more than six-and-twenty years since I have been at all troubled “with these pains; and this experiment I have made not only upon myself, “but upon a very great number of patients; and that with the same success;” and this electuary, of which he speaks, is the same that our Capivacci (*n*) said “deserv’d the highest commendations,” in the gout, “as “had often been prov’d by experiment.”

I have spoken thus at large of Bayrus, lest you should say, that the purgings, made use of by Gatinaria, had succeeded so well, because he began just then to be troubled with the gout; and besides, through the whole space of two years, drank little or no wine: although I know a learned man who, being troubled very much, and for a long time, as his brother was also, with the gout; and having tried all other things, and amongst these water-drinking,

(*l*) Vid. apud Donat. c. 8. supra ad n. 4. cit.

(*m*) De medend. hum. corp. malis Enchir. Dist. 19. tr. 1. c. 1.

(*n*) Consil. Medic. a Scholz. edit. 232.

instead of wine, for a year together; gain'd not the least advantage thereby, and even became weak and emaciated, till he began to make use, every day, before his sparing supper, of one of the *Pilulæ Melanogogæ Langelotti*: by means of which pills he had stools that were, for the most part, mucous, but not in great quantity.

For, by these means beginning to be better, he went out from home: and I saw him afterwards walking firmly, and expeditiously, without any staff or support; being of his former habit of body, and in good health; at which time he took one of those pills only every fifth day.

Nor is it to be doubted, but the most modern writers in medicine, would, if they had not well-known instances of this kind, have, themselves also, forbid every kind of purging to gouty patients: and indeed they do not approve very violent medicines of this kind, especially in the paroxysm; but they recommend the more mild purgers, when the paroxysm is at hand, and even when it is incipient; and still more to prevent other paroxysms.

7. In regard to the milk-diet also, as it is call'd, it is certain that we ought to consider of it again and again, before we prescribe it to arthritic patients; lest it should happen to be injurious to an impure body, or one that is liable to hypochondriac affections: or should be of more detriment than utility to a weak stomach. And, indeed, the most eminent physicians have asserted, that this utility is very precarious, and of short continuance; even in those who bear milk well: and that soon as ever the milk-diet is omitted, and they return to the diet of healthy persons, although mild and gentle, the gout returns, and troubles them far worse than before; or that, in the stead of it, the most violent internal disorders come on, which are soon after follow'd by death.

However, neither every kind of milk, nor milk taken in every way, of course leaves these inconveniences behind it; as, for instance, if it be given to those with whom it agrees: and not milk only, but other proper foods also; nor too great a quantity of these foods be given at the same time; in the same manner as we do, not uncommonly, in other disorders.

At least, among the observations which Daniel Puerarius, as I suppose, added to the observations of Thomas Burnet (*o*), there is one of a count, who, when his stomach was not able to bear the farther use of milk, liv'd upon puddings made with milk and sugar, and chickens fed with bread soak'd in milk; by which means returning to his former method of living, he was, indeed, subject to very slight pains of the joints, and such as could be easily got rid of, but not to such as he had been formerly troubled with.

And "not a few" other persons of gouty habits, having taken milk about the space of two years, "indulg'd themselves afterwards in drinking freely of wine without any disadvantage." Thus far he. But Cornelius Celsus (*p*) has deliver'd down to us in his writings, "that some gouty patients, having cleans'd themselves universally, by the use of asses-milk, had escap'd this disorder for ever."

(*o*) Theſ. Med. Pract. l. 1. S. 40. in fin.

(*p*) De Medic. l. 4. c. 24.

And Pliny (*q*) has confirm'd this by saying, "There are examples of those who have been freed from the hand-gout, or the foot-gout, by drinking asses-milk." Which passage, I see, is copied in the annotations to the *Consilia* of Ballonius (*r*), not without a remark, how a easy remedy of this kind, and one proper to correct the acrimony of the arthritic serum, should be omitted by the physicians of that time.

And when different things were objected by different persons to those who, after that, renew'd the Hippocratic use of milk against this disorder; Lodovico Testi arose, an excellent old man, and an intimate friend of mine, who found out a method of using milk that was liable to less difficulties; by inventing the sugar of milk, as he call'd it. The successful effects of which were prov'd by many persons, both among our countrymen and foreigners; yet when the author was dead, the use of his invention seem'd, I know not how, to decrease.

8. But do not expect that I treat of quicksilver in like manner, the use of which, so as to excite a salivation, has been recommended by some authors against this difficult disorder, among other remedies, as Etmuller (*s*) will shew you; though some in a different manner from others, among whom is the celebrated Pujati (*t*).

For I will not speak of this remedy more particularly here, than of diaphoretics, and of the more bitter or heating herbs: not only to prevent prolixity, but also that I may say no more of these remedies than of others; I mean, that they may sometimes have their use; and that, at other times, they are not only useless, but even injurious; and especially the more violent kinds.

I therefore remember that, when a certain physician was relating to me, that he, by giving quicksilver to gouty patients, who were moreover affected with a lues venerea, having promoted a plentiful salivation, had driven away the lues indeed, but had not in the least diminish'd the cause of the gout, as they continu'd to be attack'd therewith no less violently than before; I remember, I say, to have answer'd, You have reason to be content that their fits have not been more violent.

And although in this disease, as well as in others; not to say more in this; we ought to use the fewest and mildest medicines we can; and though this is the plan I have always pursu'd; yet if, at any time, some peculiar causes require a remedy which we should otherwise avoid, we must give credit to Boerhaave (*u*), who writes, in regard to the gout, "that whatever remedy is most opposite to the cause from whence the disorder had its origin, this is, in every one, the greatest and best remedy;" especially where this seems to agree with the constitution of the body which we endeavour to cure. And hence it is, that some medicines which have been suspected by many physicians, have been of great use in this disease.

Thus; to speak a little of external medicines also; how useful in preventing and curing the pains of the joints, the oil from the roots of the

(*q*) Nat. Hist. l. 28. c. 9.

(*r*) L. 2. Conf. 3. Annot. 4.

(*s*) Prax. art. 8. supra ad n. 5. cit.

(*t*) Dissert. de Hydrarg. n. 51. & seqq. & in fin.

(*u*) Aphor. de cogn. & curand. morb. 1280.

cinnamon-tree has been, appears from the *Transactions*, as they are call'd, of the Royal Society of England (*x*). Thus, how many and various things, that have given ease to these pains, when externally applied, do we meet with in turning over the writings of physicians.

To speak only of fat; I remember that the fat of frogs, hedge-hogs, geese, wether-sheep, and dogs, have been recommended. I have also seen that of asses sometimes prescrib'd by Albertini, which you will find mention'd by Paullinus (*y*), and yet not for this purpose. Will you suppose, then, that because any one of these things has been sometimes of use to some persons, it must be suitable to all persons, and at all times?

It is certain, that Albertini applied the fat of asses, in a certain ischiadic man, who was neither affected with very great pain, nor inflammation. But, at other times, in order to assuage the pains of the joints, as far as it was proper, he made use of no other remedies than what most of us make a practice of using; yet, in every one of them, he chiefly made use of that wherewith every one us'd to be eas'd: as, for instance, a piece of fresh beef, chang'd twice a day; or, to take notice of a thing which I have nowhere read of, but was us'd to a senator of Bologna, with great advantage; a rag moisten'd with the juice press'd out from the leaves of elder, and slightly warm'd.

I know, indeed, that the flowers, or tender stalks, of elder, or even the leaves themselves, but join'd with other things, have been recommended by the Greek (*z*) and Latin (*a*) writers; yet the simple juice of the leaves I do not remember to have seen recommended.

9. But these external, and those internal remedies, likewise, whereof we have spoken; and others that are recommended by authors; whether they have been useful to any person, for the reason which was just now pointed out, or have been applied, by accident, near the decline of the disorder, which sometimes comes on much sooner, of itself, than it generally does; or even (which I would have you understand, in particular, of those medicines that are call'd preservatives) whether the health which is ascrib'd to their use, would be more justly ascrib'd to the exact method of living which is order'd to be observ'd, at the same time, for a long while (both of which circumstances Cælius Aurelianus (*b*) suspected also: and Celsus (*c*), and others, testify the second, even of itself, to have brought "a security from " the disorder, through the whole course of life"); this is certain, that most of them have either never been at all useful. or, at least, very little, to most persons: and that some of them have thrown patients into very great danger, or have brought on the cause of their death.

Therefore, if you compare all the circumstances I have taken notice of, with the disorder of that woman (*d*) whose history led us to these remarks; you will readily conceive how few things could have been of any use (for as to perfect health, after the bone was in part corroded and destroy'd, that

(*x*) Saggio delle Transaz, &c. Tom. 4.

(*y*) L. de Afino, S. 4. c. 3. § 12.

(*z*) Dioscorid. de Med. Mat. c. 168.

(*a*) Scribon. Comp. Medic. 160. Samonic.
de Medic. c. 42. Marcell. de Medicam. c. 36.

(*b*) C. 2. supra ad n. 3. cit.

(*c*) C. 24. supra ad n. 8. cit.

(*d*) Supra, n. 2.

could not be expected); and, on the other hand, how many would, without doubt, have been very injurious.

Among these you will reckon those, also, that I have not yet mention'd, but only had a view to; I mean, such things as repel the arthritic matter already deposited about the joints, or beginning to be deposited, force it inwards to the veins, and prevent it from being deposited, (then or afterwards) by astringing the small vessels that carry it to the joints, and unseasonably corroborating the fibres. For how much injury it may do when excluded therefrom, may be even conceiv'd from the utility which it very often brings with it, when admitted thereto.

See, for instance, how the disorders of the hearing with which a gentleman was troubled, and to which other remedies gave no relief, us'd to be entirely remov'd by the gout coming on; and return when the gout went off; as Reusnerus (*e*) remark'd: and how the wife of Gerbezius (*f*) was wont to have a severe pain, for a long time, in her breast and stomach, till she was immediately freed therefrom by the appearance of the gout.

But why do I seek examples from these, and other writers, (that could furnish one with so many) of the utility of this disorder, which I have experienc'd in myself. For when I was afflicted with that inflammation of both eyes, whereof I have formerly made mention (*g*), which now almost approach'd to a chemosis, and had made use of other remedies in vain; and I myself thought, and my friends confirm'd the opinion, that blood-letting should be delay'd no longer; it came into my mind to try, before I had a vein open'd; for I never had been bled, nor ever have been to this day, though I am now in my seventy-ninth year; to try, I say, whether bathing the feet with warm water, and using gentle frictions thereto, would be of any advantage.

And I had not done this for more than two evenings, before a pain, which came in the very joint of the right toe with the metatarsal bone, shew'd that the gout was at hand: and this pain, being increas'd slightly in the night-time, immediately diminish'd the inflammation of my eyes; and in a few days took it off.

This gout was very mild, as I had never had it before, and my parents and ancestors had not been subject thereto; nor did I feel any thing of it afterwards for five years, at the end of which period it appear'd in the left knee, but in a very slight degree; so that the effect of this pediluvium, in bringing on the gout, was similar to that in the young man whose history I see in the *Commercium Litterarium* (*h*), but the gout very dissimilar in its violence: nor is this to be wonder'd at: since he; to omit other things; did not make use of a milk-warm bath, as I did, but of one extremely hot.

However, in proportion as the gout is of advantage, when the joints afford a free admission to it; so much injury does it bring on the other parts, when the joints will no longer admit it. And though this might be confirm'd by innumerable observations, many of which you may see, if you please,

(*e*) Eph. N. C. Cent. 5. Obs. 8.

(*f*) Earund. Cent. 8. Obs. 6.

(*g*) Epist. 13. n. 24.

(*h*) A. 1741. Hebd. 25. n. 1. propius fin.

in the volumes of the Cæsarean Academy, and particularly Dec. 3. A. 5, & 6. Obs. 55; it will be sufficient for me to take notice of one from him whom I frequently and deservedly commend; I mean, Hippol. Franc. Albertini (*i*).

For a goldsmith, who us'd to labour under the gout, every year, and had more than once driven it away by anointing his feet with petroleum, when the disease was at hand; fell into many more violent disorders, which would not be put to flight, unless by discharging a great quantity of matter from the intestines; which, that you may readily perceive it to have been of a gouty kind, was made up "of lime, or gypsum, as it were, lately cemented together."

This matter, therefore, when excluded from the corroborated joints, frequently falls upon the parts that are contain'd in the abdomen, the thorax, or the cranium; bringing on present danger, and frequently death. And the same things happen when any internal cause prevents the matter from being carried to the joints; and particularly a decrease of vital power. And this you may not only argue from two observations that I have sent you heretofore (*k*), but you will more evidently learn from the following.

10. George Corneli, cardinal of the holy Roman church, and bishop of Padua, having been, for a long time past, extremely subject not only to pains of the joints, but to pains of the kidneys also; and being now free from these pains, no calculi appearing any more, and the discharge of urine being greatly diminish'd; seem'd to be falling into a dropsy, and perhaps was really so; but that a very powerful diuretic, which was given him, caus'd a great quantity of urine to be discharg'd.

At that time, not the least calculus was seen: nor for many years afterwards was there any symptom of the kidneys being affected; notwithstanding he travell'd in his chariot through a long and rough road, and had changes of horses for the sake of dispatch; I mean, in the year 1721, when he went from hence to Rome. and from Rome to Padua again.

However, though the nephritic pains did not trouble him in those years, he was not, for that reason, free from the arthritic complaints; but these returning now and then at times, were even the more violently and frequently troublesome to him, because, by reason of his being of a fat habit of body, and but weak in his lower limbs, and by reason of his advanc'd age, he was prevented more and more every day, from making use of his wonted exercise.

To these complaints were added a continual costiveness for a long time together, a heaviness of the head, and of hearing after that, together with a propensity to sleep; and, finally, frequent swoonings. In this manner having scarcely pass'd his sixty-fourth year, he at first lost his appetite for all kinds of food; and then was attack'd with the arthritic paroxysm: and now his right hand, and his left knee, began to swell, when he receiv'd the melancholy news of the fatal disorder of his most serene brother Giovanni, Doge of Venice, whom he sincerely lov'd.

(*i*) Comment. de Bonon. Sc. Inst. Tom. 1. in Opus. de Cort. Peruv. haud ita procul a fin.

(*k*) Epist. 25. n. 10. & Epist. 40. n. 2.

From this time he, though in other respects a man of a great mind, was seiz'd with incredible grief and uneasiness; and soon after, not only the gouty matter ceas'd to be expell'd to the joints, but even that which had been expell'd return'd into the veins, and brought on a streightness and oppression of the præcordia, a difficulty of breathing, and besides these a kind of sudden paroxysm; wherein the functions both of the brain and heart failing, death seem'd to be at hand.

Then his senior physician, and those who were present, either of relations or friends, hastily sent for me into consultation. I found the patient, however, a little recover'd in the mean time; but so unlike himself in mind, as well as body, that I was immediately struck therewith, and call'd to mind that prænotion of Hippocrates (1): "To do any thing contrary to custom is a bad sign."

For he who before, in the most difficult affairs, was never wanting to himself, or to others, had entirely given up all hope of life, as I perceiv'd from his words; in which he advis'd us not to attempt to relieve him by our vain endeavours: nay, he even commanded and ask'd it; and this, in particular, he begg'd again and again of me, while I was feeling his pulse, and conjur'd me by that great regard and friendship which he had always borne me.

His pulse, as I then and afterwards perceiv'd, was very bad; for it was very weak, and generally intermitted after two strokes, but always after a few strokes. It was manifest, that, unless the peccant matter could be recall'd to the joints, the patient could not be sav'd. Yet it was not less evident, that the difficulty of recalling it, in that dejection of strength, would be very great; and particularly as he was firmly persuaded in his own mind, that every thing was to no purpose.

I, therefore, said apart to those to whom it was my duty so to do, that he was in the greatest danger: and I took care that this should be immediately signified, by a running footman, to his brother's sons at Venice, in letters dictated by me. However, nothing was at that time, or afterwards, omitted, out of all the things that we had determin'd to do; or, at least, as far as the strength of the patient would permit, and we could prevail upon him by intreaties to submit thereto.

And now the knee began to swell again; on which day we observ'd the pulse to be grown a little better. But nature soon after growing languid, every symptom grew worse; and the difficulty of breathing increas'd: his head was more and more oppress'd with sleep: and not only the internal parts, but the limbs also, were seiz'd with convulsions; though we did every thing in our power to prevent it. And in this manner that most excellent cardinal, that best of priests, and great encourager of learning, was snatch'd away on the tenth of August, in the year 1722; at which time nearly, his brother also, who was the best of princes, and subject to the gout in the same manner, was carried off likewise; all good people being griev'd at the fate of these unhappy brothers.

(1) In Coac. n. 1. apud Marinell.

As the body was to be embalm'd on the following night, in order to have the funeral-rites perform'd after the manner of his ancestors ; I sent a pupil of mine, who was well practis'd in dissection, to take out the viscera, and examine them attentively ; for I could not bear to be present myself. From this pupil, therefore, and from the physician whom I spoke of before, I soon after made every proper enquiry in regard to the appearances. And this is the substance of what both of them related.

The belly, which was very fat, had its mesentery, and the small intestines, loaded with a great quantity of fat: the stomach was large ; but the coats thereof were greatly extenuated: the liver itself was in a natural state ; but the gall-bladder was small, and the coats of it so thin and flaccid as to be broken by the touch ; a round calculus falling out, which was not small in proportion to the smallness of the vesicle, and was the only one contain'd therein, and that without any bile.

The kidneys were larger than they naturally are, but the right was the largest ; so that, together with the fat whereby it was cover'd, it was almost equal to the size of a man's head. Therein were eleven stones, most of them large and ramifying. In the left was one, and that also was ramified and small.

These calculi, in their colour and branches, resembled nothing more than black coral ; for they brought them to me that I might look at them ; but they could not have been seen by those who have hinted, that they were similar to the stones which Alghisi (*m*) has delineated in his third table. However, that substance of the kidneys which lay next in order around them, was hard and callous.

Upon opening the thorax, nothing was found in the lungs that was preternatural ; but the trunk of the aspera arteria had its cartilages very hard, and not easily yielding to the hand, when constringing them. Which species of disorder was also observ'd in the iliac arteries, and in the neighbouring trunk of the aorta, from whence they arise. Nor was it wanting within the thorax ; but there the more the great artery receded from the heart, the more manifest it became. And this artery was much broader within the thorax than it ought to have been.

In the heart was no polypous concretion : and but a very small portion of blood, and that frothy. Nor was there much blood in the whole body ; if you except the integuments of the head, in cutting into which a pretty considerable quantity of blood flow'd out.

The cranium being open'd, besides the serum which was observ'd therein, the whole substance of the cerebrum was lax to a very great degree.

11. Too many and considerable disorders, besides those that were manifest, lay hid in this body, to suffer the arthritic matter to be thrown back upon the joints, either by nature or by art. It is true, the laxity of the cerebrum appear'd, in great measure, from the preceding symptoms of heaviness of the head, and of hearing, and the propensity to sleep.

But would you have suppos'd it to be grown so lax, as to be already almost unfit for performing its principal office, and very fit for receiving a

Ulcere

(*m*) Litotomia.

quantity

quantity of arthritic serum ; from whence those external and internal convulsions, to which the straightness of the præcordia, and the very great difficulty of breathing, as the lungs were in other respects unhurt, (for neither did Joerndensius (*n*) find any thing morbid within these viscera, in a case almost similar) were to be attributed.

And with what force could the great artery, that was wider than usual, and had its coats very hard ; as the iliac branches of it had also ; impel the peccant matter into the upper and lower limbs ? It was certainly more likely to retard, now and then, the motion of the blood ; from whence not only those deliquia, but that last attack, and the intermission of the pulse, are to be accounted for : especially since the heart was greatly debilitated, as appear'd from the weakness of the pulse, and not without reason ; inasmuch as the strength of the heart could not be preserv'd by such a brain as that was.

To this was added, that, though the heart was weak, and the arteries, in their state of hardness, had by no means strength equal to circulate even the best and most vivid blood ; they were under a necessity of propelling an effete and impure blood : for this was shown to have been such, not only by the latter part of his life having been pass'd without any exercise, or agitation of body, but also by the many præternatural appearances found in the belly.

For, in the first place, the stomach, in so lax and extenuated a state, could not well prepare the aliments. And, in the second place, the intestines were not able to prepare the chylé ; as no bile was now discharg'd from the vesicula fellis, and only a small quantity, and that not good, had, for a long time, flow'd down ; the former of which circumstances was prov'd by that small bilious calculus, and the latter by the smallness of the cyst, and the long-continu'd costiveness of the intestines : and you readily perceive how far this striction of the bowels was likely to prevent the purgation of that impure blood.

And as to the purgation finally, which blood of that kind certainly needed, if any at all did, as that is made principally by the skin, and by the kidneys ; this was not done so much by the skin, in a quiescent state of body : and who can suppose that it was sufficiently done by the kidneys, which were so oppress'd, and in part callous ?

Nor does it escape me, who took notice of the cause thereof, upon a former occasion (*o*), and particularly confirm'd it in fat persons ; nor does it escape me, I say, that calculi of the kidneys are often join'd with the gout ; and I even know that, on account of these calculi, the blood of arthritic patients is less purg'd ; and that by these means the gouty matter is increas'd. Yet I would not have you infer from hence, that, in all these persons, this matter could not be so well propell'd to the joints : or if it should have happen'd to recede therefrom, and fall upon the internal parts, that it cannot be recall'd to the joints.

And indeed, I remember, that in the senator of Bologna, whom I took

(*n*) Act. N. C. Tom. 4. Append. n. 5. in fine § 5.

(*o*) Epist. 40. n. 3. & 5.

notice of above (*p*), and who was troubled with calculi of the kidneys also; besides the gout; when the knees and hands began to swell, and soon after, of a sudden, and without any manifest cause, the pain and the tumour vanish'd almost totally, and a consequent difficulty of breathing alarm'd every one; I remember, I say, that in this patient however, the peccant matter was recall'd to the joints by Albertini, by means of the same remedies we made use of here to no effect.

But then the age was not the same, nor had the senator any grief to oppress his mind; nor those disorders of the brain, and the great artery: and although calculi did not fail to be discharg'd now and then, yet they were not to be compar'd with those of which we are at present speaking.

12. For, in the first place, these resembled the form of coral. Which it is necessary you should attend to, not so much for the sake of admiration, as for knowing their cause and effect. For you will read in the Sepulchretum, that calculi were found in the kidney, which resembled the shape of a mouse (*q*); not to mention those which resembled the form of coral (*r*). And Eustachius, who gave almost the first observation of all, of a calculus in the form of coral, has sufficiently shown the cause of a figure of this kind (*s*). According to which, Piccolhominus (*t*) has afterwards explain'd the form of a mouse also, in a calculus describ'd by him.

And if the history thereof had been transferr'd into the Sepulchretum from the author himself; the readers would not have been ignorant after what symptoms it had been found. Therefore, as the calculous matter stagnates in the pelvis, and the beginning of the ureter; it is by that means moulded into the figure which resembles the body and head of the mouse; or which resembles a stump of coral: and as it stagnates, at the same time, in the tubuli that open into the pelvis; so the calculi represent the tail and legs of a mouse, or the branches of coral.

When the urinary passages are all, or most of them, beset with calculi in the manner I have mention'd; and the very small and contiguous instruments whereby the urine, if separated from the blood, are compress'd; you certainly see that the secretion, and excretion, of the urine must be diminish'd; or the last altogether intercepted: and unless assistance be brought by nature, or by art, or by both, that a dropsey must begin to come on, or some other great disorder arise.

You see then, from what cause the dropsey had begun to arise in the very eminent man in question, when the urine being urg'd on by a very strong diuretic remedy, the obstructed passages were partly clear'd thereby, but the passages which were not as yet beset with calculi, were immoderately dilated; and this was the chief part of the effect: so that the urine flow'd plentifully then, and afterwards; nature lending her assistance at the same time, as she, after that, sent the matter, which would have added new branches to the calculi, more frequently, and in greater quantity, to the joints.

But although some tubuli were preserv'd in an open state, and even wider

(*p*) n. 8. in fin.

(*q*) l. 3. S. 22. Obs. 26. § 6.

(*r*) Ibid. Obser. 21. § 4. & seqq. & S. 25.

Obs. 20. & S. 28. Obs. 26.

(*s*) Vid. § 4. cit.

(*t*) l. 2. Anat. Prælect. 23.

than naturally; yet many remain'd entirely uselefs, being entirely full, and stopp'd up with branches of calculi: and what is more to be attended to, the substance of the kidneys, which lay nearest round about them, was render'd hard and callous together with them, by continual compression.

And this was the reason, why no uneasiness was perceiv'd in the kidneys, even from the greatest agitation of body; especially as the very close adhesion of the tubuli to the branches of the calculi, prevented these from being agitated: as you will learn from the Sepulchretum (*u*), that it had done in others, when great stones, similar to coral, and "driven in like nails or "spikes," adher'd immoveably in the kidneys.

But so many parts of the substance of the kidneys being made callous, and for that reason uselefs, can we suppose that the function of these viscera had suffer'd no detriment?

Besides, these calculi were not only in great number, but large; so that, of course, the remaining substance of the kidneys would be partly overloaded, and partly distracted. And the parts which were thus overloaded and distracted, certainly could not perform their office perfectly, in separating the uselefs and noxious particles from the blood, which at other times they are wont to do. Finally, these calculi were in the body of a man, in whose gall-bladder another was contain'd; and consequently in that body which needed more the separation of those particles, as is hinted above (*x*).

Nor am I ignorant, indeed, that calculi of the gall-bladder may also be produc'd in the same bodies that are liable to calculi of the kidneys; but have even confess'd it formerly in another letter (*y*), wherein I have made mention of those found in this very eminent cardinal: nor is any thing more easy for me, than to produce a great number of observations, of those persons who have found them in both places at the same time.

For besides so many others, that you will find taken notice of by me in other places (*z*); and besides that remarkable one which is referr'd to by the celebrated Pohlius (*a*), and might be added to the Sepulchretum; I remember to have read six in the Sepulchretum, and all these in the third book (*b*): among which is one of Grembsius, that agrees with the one I have here given in this circumstance likewise, that "no gall" was found in the gall-bladder. But none of these persons, that I know of, was troubled with the gout: or if any one was troubled therewith, he, at least, had not so many other considerable injuries of the vessels and viscera.

13. There are other disorders also, which sometimes show themselves in the joints; as, for instance, that which I saw in a woman, whose dissection is, for more than one reason, worthy to be describ'd to you on the present occasion.

14. An old woman, who was the mother of many children, had been seiz'd with an apoplexy about three months before. This apoplexy had been succeeded by a paralysis of both limbs, on the right side; yet in such a man-

(*u*) Cit. Obs. 20. & 26.

(*x*) N. 11.

(*y*) Epist. Anat. 1. n. 48.

(*z*) Epist. 37. n. 43.

(*a*) Dissert. de Prost. calcul. affect. §. 7.

(*b*) S. 22. Obs. 1, S. 23. Obs. 4. §. 10, S. 24. Obs. 2. §. 12. Obs. 6. §. 4. Obs. 10. secunda §. 4, & S. 25. Obs. 9. §. 5.

ner, that they could be mov'd a little, and had the faculty of feeling left entire. But last of all; when a kind of sleepiness, as it were, had come on, and a considerable hesitation of speech; being brought into the hospital, she there gradually sunk away, and died: this was after the beginning of December, in the year 1746.

Of the many things which I observ'd in the course of several days dissection, in this body, these are the principal that relate to the present subject.

In the belly, the uterus was so short in its length, that even externally, from the orifice to the upper part of the fundus, it was scarcely equal to two fingers breadths. But it was wholly contracted into itself, and conglobated; so as to resemble, in some measure, a kind of little ball, depressed on the fore-part and back-part, the parietes being thicker in proportion: and in cutting into the substance of these parietes I found it to be livid, and did not judge it to be perfectly sound. The larger extremity of one of the tubes was not only impervious, but entirely grown into one substance with the testicle, which, like its fellow, was hard, and in some measure chequer'd on its surface.

In the thorax, the heart contain'd large polypous concretions.

On the integuments of the skull, where they cover'd the left temple, a large blackness, as if from contusion, appear'd externally and internally; although no blow had been receiv'd, upon the head, any little time before death, (as far as we could learn by enquiry) or soon after. In the whole left hemisphere of the cerebrum, contrary to what the hemiplegia had given us reason to expect, no disorder was found.

But in the right, I first observ'd that the vessels which pass through the pia mater, especially where they corresponded to the vertex of the head, were very turgid with blood: and through the same membrane I saw water, as it were, mix'd with particles of air; and this water was really beneath: but in so small a quantity, that the pia mater was not easily drawn off by the fingers. And after this I found a singular disorder of the substance of the brain, and that a very considerable one; being about the vertex, to the extent of three or four fingers breadths, in the longitudinal direction of the head: and for as many in breadth, where the disorder was the widest; for in some places it was much more narrow.

This disorder began from that upper border of the hemisphere, where it is nearest to the left side, and extended itself, from thence, in breadth. From the surface of the cerebrum; which it occupied; it did not descend inwards more than an inch. In the whole of that situation then, which is mark'd out, both the substances of the cerebrum were of a faint and brownish blood-colour; and not less soft than if it had been, for a long time together, cut, and in a manner chopp'd with a knife, so as to become almost fluid. Yet it was no where foetid.

But the remaining part of the cerebrum; except that, if you compar'd it with the cerebellum and medulla oblongata, it was more lax than these parts; offer'd nothing that was preternatural, even upon the most diligent enquiry; so that I did not find any serum extravasated in the ventricles, although I observ'd the pituitary gland to be very much contracted, and sunk in its situation.

Finally,

Finally, as in the left knee (which was cut into, in order to demonstrate the internal ligaments, cartilages, and glands, to a crowded circle of spectators, who had likewise seen all that has been spoken of above) I saw no mucilage; I began to inspect all the parts very attentively, which, however, were pretty well lubricated: and I saw the cartilaginous crust of the rotula, in the part where it corresponded to the external condyle of the femur, rubb'd away, as it were, and mark'd with slight and small parallel furrows; much in the same manner as if any one had press'd the point of a chissel, or graving-tool, upon it, and drawn the instrument from the top to the bottom several times: and the crust of the condyle, which I just now mention'd, where it was turn'd to the same part of the rotula, was so extenuated as to appear somewhat livid, by reason of the bone being seen through it.

But what was much more worthy of observation than all these things, was a great number of globules, the five largest of which were almost equal to small grapes; the remaining globules, which were more than twenty, being some a little less, and some much less, than the former. All of them were white, and of a smooth surface: and all of them, being disjoin'd from each other, were prominent within the cavity of the joint; adhering by a very small part, and even being continu'd, the lesser of them to the capsular ligament, about the inferior sides of it, (so that some of them were dispos'd into an oblong series) but the larger to a cartilaginous crust; or, rather, to the fimbria of a mucilaginous gland, which closely cover'd the cartilaginous crust, in some recesses of the bones that belong to the cavity of the joint.

Yet others were entirely bony, and some contain'd a bony nucleus under a cartilaginous crust. I should have examin'd the other knee likewise, to see whether any of the same appearances were there, and whether any thing there might better shew their origin; but I was disappointed, as I found that this had been buried together with most of the other parts of the body.

15. But from whence-soever their origin was, this is certain, that, if they had grown out from the mucilaginous glands, they might, by diminishing the secretion of the mucilage, do an injury to the joint; or, if they were from any other part, and had not hitherto done much mischief, (since this could not be known for a certainty) they would have been injurious, to a considerable degree, by their increase.

And, indeed, if any one should happen to say, that some one of the smallest of those bony globules was pull'd away from its situation by the agitation of the knee; and, being interpos'd betwixt the condyle and the rotula, had made those appearances in the cartilage that are spoken of; he would not assert any thing that was utterly absurd: although I remember, when, in the following year, I examin'd the knee of a man in the same place, to have found the cartilaginous crust of the same condyle corroded, as it were, in some measure, in that same part where it touches the rotula, though not for a larger space than what the nail of a man's little finger could have cover'd; yet some other small spaces in that neighbourhood were affected in the same manner: however, there was no appearance of disorder in the rotula, nor any-where else in the whole joint; and still less did any globules protuberate. The description of which circumstances I thought

less proper to be pass'd over, because I do not think I have read any author (c) who has made mention of a disorder of this kind in the knee-joint.

Yet when I was revising this letter, there came out an observation of the illustrious Haller (d) upon another joint, which was pretty similar to this. That is to say, in a decrepid woman; in whom many of the arteries, and some of the valves, of the heart, were not without bony scales, or the beginnings thereof; while he was inspecting the joints of the lower jaw, with the bones of the temples, he observ'd one of them to be "stripp'd of its cartilaginous crust; and the lunated cartilage almost half-consum'd, and perforated. And the crust, which attrition had destroy'd, the same attrition had chang'd into almost twenty globules, half-bony, and collected loosely in the cavity of the capsula." In the other joint there was nothing of this "wonderful appearance," but every thing was in a natural state.

I should have copied more to you, if he had added more, that you might have compar'd all the circumstances with my observation. But it does not seem that it was in his power to learn, what, and how great, inconveniences the woman had suffer'd therefrom.

Nor have I read many authors, who have taken notice of that kind of corruption in the substance of the cerebrum, which I found in the old woman in question, as I did nearly in a few others (e).

Moreover, a paralysis of the body, on that side which lies beneath the injury of the brain, instead of being opposite to it, is not a very common thing. You may, therefore, add this observation to the few others which I have refer'd to heretofore (f), among the much greater number of opposite paralysses, as if by way of some exceptions: unless you should happen to say, that the injury here was either not sudden, or too remote from those parts of the brain, (I mean, the ventricles and the protuberances therein) to the sudden injury of which, chiefly, the hemiplegia in the opposite side is observ'd to succeed.

Yet whether this can be said of that observation which I have refer'd to formerly (g), as propos'd by Curti, a Neapolitan physician; it is, perhaps, not very easy to determine.

For to a resolution of the right side, in consequence of an apoplexy, he saw a correspondent corruption of the substance of the cerebrum, (not far unlike that of which I was speaking just now) not in the left, but in the right hemisphere; and that in the whole of it; so that even the meninges were converted into a mucous substance: although, as he says nothing of the crura medullæ oblongatæ, which grow out into those protuberances, there may seem to be some reason for doubt still remaining.

16. There is, in fact, so great a similarity betwixt the rheumatism and the gout, whereof we treat in this letter, that physicians have distinguish'd the former from the latter but lately; although not so lately, that this was first done about the middle of the preceding century, as some say who forget.

(c) Vid. Epist. 69. n. 13.

(d) Progr. de indurat. corp. hum. partib. § 5.

(e) Epist. 5. n. 6. & Epist. 9. n. 16. 18.

(f) Epist. Anat. 13. n. 25.

(g) Epist. 9. n. 19.

Ballonius (*b*). But no mention in particular is made of rheumatism in the Sepulchretum, not even in that place where it would have been most proper; I mean, about the end of the eleventh section of this fourth book, where it relates to pains “of the external parts.”

Yet I do not wonder at it, as I scarcely remember to have lit on any other dissection of a rheumatic patient, but that taken from the mouth of Drelincurt, and made mention of by Havers, in his Osteology (*i*); in which dissection Drelincurt found “a jelly concreted on the surface of the muscles, equal to “two or three ducats in thickness.” Which observation might be added to the part of the section of the Sepulchretum that I mention’d before; as it is very short, and is made up, in good measure, of histories which are produc’d in other places; and even ends in one that had been already given in this very page (*k*).

I, who have treated of things which relate to the other parts of the same section, in other places, will subjoin here, lest I seem to have entirely omitted this last part, two observations of our Mediavia’s; the first of which relates to pains of the external parts: and the other would have seem’d to relate thereto, if dissection had not discover’d the case more clearly.

17. A young man, who was a goldsmith, had a violent pain in his loins, on the right side, which yielded to no remedy. A year being thus pass’d over, the pain began to attack the left side of his loins also: nor was he free from pains in his neck, which seem’d rheumatic; when an inability of moving his legs came on, a hydrops tympanites, and finally death, about the middle of April, in the year 1753.

We were permitted only to cut into those external parts of the body which had been the seats of that very obstinate and violent pain of the loins. The skin, therefore, and the adipose membrane, being taken off from these parts; in the cells of which membrane some water was seen; and that large tendon, from whence the muscle latissimus dorsi arises, being remov’d, and no mark of injury being observ’d in this tendon on either side; when we came to that thick fleshy body which affords a common origin to the sacro-lumbus and longissimus dorsi muscles; behold! an unusual colour appear’d in that body, such as we see in old furniture made of the nut tree; and yet not in the whole of that body, but only for about the space of five inches in length, and in breadth in like manner: and this was continu’d inwards, from the surface, in such a manner, as to be seen in the subjected muscles likewise; that is, the sacro-lumbus and quadratus lumborum.

The fibres, in the whole of that space which I have pointed out, were surprizingly lax and yielding, and disjoin’d by frequent coagula of blood lying betwixt them. And all these disorders that I have spoken of, appear’d so much the more, in proportion as the muscles were nearer to the spine: but without that space in the loins, neither a preternatural colour, nor any thing preternatural, was observ’d in the muscles. And, indeed, there was

(*b*) Vid. ejus librum de Rheumatismo, & quæst. medic. illi adjectam.

(*i*) Disc. 4. ubi de Rheumatismo.
(*k*) Obs. 7. § 11. & 7.

no very disagreeable smell in the part where these disorders were observ'd. All these appearances were found in both loins; but those in the left were much the slightest.

18. I am here aware that you will make two enquiries of me; one, from whence arose that inability of moving the legs? the other, from whence the pains in the neck? And, indeed, you will easily, of yourself, conjecture the cause of these pains; if, bearing in mind my observations (1) which I have confirm'd in the following years, you are not ignorant that the longissimi muscles, whose origins we found to be diseas'd in this body, were continu'd to the neck, in all those bodies wherein I have made the enquiry.

And as to that inability of moving the limbs, perhaps, nothing forbids us suspecting it to have arisen from hence, that the disorders observ'd in the quadrati lumborum muscles, also, (and these so much the more considerable, as they approach'd nearer to the vertebræ) might, at length, have reach'd to those nerves from which the crural are made up; not to say, to the psoæ muscles themselves; as those disorders were continu'd from the external to the internal parts: for that they had not been propagated from the internal to the external parts, notwithstanding we were not allow'd to examine the belly, appears from this circumstance, that there were no complaints of the kidneys, and that no symptoms of any injury of these parts were taken notice of; and the legs were not weaken'd when the disease was incipient, but when it had already proceeded for some length of time.

19. Now take the second observation, which, on the other hand, though it might seem to relate to external pains, yet, in fact, was found to relate to the internal parts, and therefore better deserves not to be pass'd over.

20. A monk of Padua, who was, at least, seventy years of age, had begun, after a kind of fever attended with a coldness, to labour under pains, which he suppos'd to be from defluxions, as he call'd them. These pains seem'd to lie in the muscles, which were about the os innominatum on one side, and a little above anteriorly: and in those that are extended through the femur on the same side, being sometimes more, and sometimes less troublesome; so as not to prevent him from walking. When he had suffer'd these pains for two or three years, they at length grew more violent: and he died about the middle of July, in the year 1737; there appearing, the day before he died, in the groin of that side, a tumour wherein a matter was perceiv'd to fluctuate.

The abdomen being cut into in that part, in order to enquire from whence this matter had its origin; contrary to all expectation, a great quantity of pus was found betwixt the peritonæum and the os innominatum, which was there cover'd with those muscles that I shall mention presently.

21. You will think that this observation deserves so much the more to be attended to by physicians, as internal disorders may the more easily impose upon us under the appearance of defluxions, and degenerate into abscesses of that kind: and in proportion as the same disorders, perhaps, more frequently lie hid under a mask of this kind.

(1) Advers. Anat. 2. Animad. 15. in fin.

At least, this was seen three times by one surgeon; I mean, the celebrated Benevoli (*m*); who adds, that the same thing was likewise seen by Querci: and he very properly explains what kinds of tumours, lying near the muscles which we call psoæ, or iliaci interni, may not only be the cause of contractions that are troublesome in the thighs; but, finally, may also, when suppurated, send down pus into the upper parts thereof. These remarks, however, you will see more at large in the author himself. Farewel.

LETTER the FIFTY-EIGHTH

Treats of the Lues Venerea.

I. **I**N the letters that I have already sent you, I have communicated many observations which relate to the lues venerea. There is, then, no reason why you should be surpriz'd, if I say that there are scarcely any left to be copied here. But if you inspect those letters which I shall immediately refer to; you will see that this has been sufficiently done, when, on the occasion of other diseases, which either arose from this, or were join'd with it, I did not omit making mention of this disorder; or, if there seem'd to be any internal injuries from thence, that these were not omitted likewise.

2. For in the very first letter (*a*), when I spoke of severe pains in the head, I have told you what disorder there was in the meninges, the cerebrum, and cerebellum: and what in the cerebrum and cranium, when, in the ninth letter (*b*), I wrote of the epilepsy. And in the forty-second letter (*c*), and the forty-fourth (*d*), we meet with injuries either in the epiglottis alone, or in the other cartilages of the larynx also, and the aspera arteria: and in the same letters (*e*) (*f*) internal diseases of the great artery are spoken of; so that, supposing these circumstances, it is less to be wonder'd at, that, in the eighteenth letter (*g*), this artery is dilated into an aneurism; or that, in the fortieth (*h*), twenty-seventh (*i*), and fifty-third (*k*), an aneurism, moreover, or the artery itself, could be ruptur'd.

In the eighteenth letter (*l*) you have the lungs on one side purulent; but particularly in the twenty-second (*m*). And in the fourth (*n*), forty-second (*o*),

(*m*) Due Relaz. Chir. Vid. I.

(*a*) N. 14.

(*c*) N. 39. 40.

(*e*) N. 39.

(*b*) N. 23.

(*d*) N. 15.

(*f*) N. 3.

(*g*) N. 25.

(*i*) N. 28.

(*l*) N. 25.

(*n*) N. 19.

(*h*) N. 29.

(*k*) N. 7

(*m*) N. 10. 11. 15.

(*o*) N. 2. 40.

forty-fourth (*p*), and forty-eighth (*q*), you have the kidneys purulent, or otherwise diseas'd; and other parts of the urinary organs. Moreover, the forty-seventh letter (*r*) speaks of an excrescence in the uterus, and, at the same time, a cicatrix in the lower part of the vagina near to the urethra.

In the forty-fourth letter (*s*) you have an unusual moisture and redness of the male urethra; and in the same (*t*), and the forty-second (*u*), you have the urethra narrow and contracted in some places: and these two last mention'd letters (*x*) (*y*), the fourth (*z*), and the fortieth (*a*), speak of excrescences of the urethra, or the remains of excrescences.

And; to omit the fifty-second letter (*b*); the eighth (*c*), the twenty-seventh (*d*), the forty-second (*e*), and the forty-fourth (*f*), shew these larger canaliculi to have been generally, or in part destroy'd: and, finally, this last letter either speaks of other traces of disorders in the urethra (*g*), or of the inflammation of the part surrounding Littre's gland (*h*); or of the induration of one of Cowper's glands (*i*), or its being contracted and strigose (*k*); or of the orifices of both the ducts not being in a natural state (*l*); or of the orifices of those ducts, which bring in the semen, being stopp'd up (*m*); or, at length, of the vesiculæ seminales being contracted, and without moisture (*n*).

3. Nor, indeed, have I sent to you observations of these disorders only that I have spoken of; but even in those two letters particularly, that I often made mention of just now; I mean, the forty-second and forty-fourth; I have pursu'd, pretty much at large, some symptoms that attend, or are subsequent to, the lues venerea: that is to say, the gonorrhæa, and the caruncles, as they are call'd, of the urethra.

For in that forty-second letter (*o*), I have not omitted to say what others have thought or seen, and what it happen'd to me to see, in respect thereto. And in regard to the gonorrhæa, on the subject of which the whole forty-fourth letter turns; I have said, in order, what has been seen by others, and by myself, in regard to its particular situations: and have not omitted some other things that related thereto.

As, therefore, I am determin'd not to repeat any thing which has been already said, it now remains only to produce three or four observations in this place, which relate to the lues venerea; as I have no more than this number still left behind. The two first of these are from Valsalva.

4. A woman, who had completed her fiftieth year, was attack'd with a pain in the lower jaw, attended sometimes with so large a flux of blood, that it was intended to have restrain'd this discharge by the application of the actual cautery; if it had not ceas'd of itself. In a little time after, the woman began to be troubled with pains in her bones: with which having long

(*p*) N. 15. 27. (*q*) N. 32.
 (*r*) N. 28. (*s*) N. 3. 5. 7.
 (*t*) N. 10. (*u*) N. 39. 40.
 (*x*) N. 7. 10. 18.
 (*y*) N. 39. (*z*) N. 19.
 (*a*) N. 29. (*b*) N. 30.
 (*c*) N. 6. (*d*) N. 28.

(*e*) N. 39. 40.
 (*f*) N. 7. 9. 12.
 (*g*) N. 9. 14. (*h*) N. 15.
 (*i*) N. 3. (*k*) N. 12.
 (*l*) Ibid. (*m*) N. 7.
 (*n*) Ibid.
 (*o*) N. 38. & seqq.

been afflicted, she began, as often as ever she was mov'd, to complain that all her bones were broken; and, indeed, those who stood by her heard a crackling in her joints at that time. To this symptom another was afterwards added, that the bones of the lower limbs began to be bent, as if they were made of wax; and to be in pain even on the slightest motion.

At length, in examining her body after death, the *ossa innominata*, the *ossa femoris*, and *tibiæ*, and those bones that make up the arch of the cranium, were found to be flexible, just as if they were made up of pretty thick paper: on their surface they were spongy; and at the medullium, in some places, carious.

5. From whence that great quantity of blood was discharg'd, of which mention is made in the beginning of this history, Valsalva has omitted to say. But I have heard, from those who had seen the woman together with him, both when living and dead, that she had an abscess on one side of her neck; so that I shall suppose it to have flow'd from thence. The same persons also added, that some other bones likewise, among which were many of the ribs, and the bones of the feet, were flexible in the dead body; and admitted the knife like cartilages: and that all the bones, which yielded to the force that bent or compress'd them, discharg'd a certain fluid, similar to diluted blood, during the action of bending or compressing.

I afterwards saw these bones likewise myself; for Valsalva had preserv'd them: the oblong ones were curv'd into the form of an arch, and those that compos'd the vault of the cranium depress'd into the figure of a plane; and all of them were of a very bad colour and smell, because they could not be clean'd internally, giving an unctuosity to the fingers in handling them.

But as they had now been preserv'd for a long time; I could not learn some circumstances which I should have enquir'd into in their fresh state, and even in the body itself: among which was this; in what state the heads of these bones were in the joints; that is, whether they were more or less daub'd over with mucilage; I mean, on account of that crackling which was heard in the joints, by the assistants, when the patient mov'd them: but still much more should I have wish'd to know in what state the genital parts were, in a woman who, they said, had been so infected with the lues venerea, that they did not doubt but this very great disease of the bones had taken its origin from that disorder.

6. We should have the most ancient examples of the human bones being become soft, if what Sachsius (*p*) seems to think, with Peter a Castro, that this disorder is call'd "by the Arabians *Alachad*, and *Alzemena*, and was cur'd "by Avicenna," were certain; as it is certain, from the Latin increas'd interpretation of Arabic words of Andreas Bellunensis (*q*), which is publish'd with Avicenna, "that there is an *alzemena*, or *zemena*, when the patient, by "reason of the softness, or paralysis, of the feet or hands, is prevented from "moving those limbs: so that this title of the observation of Peter a Castro, *De Membrorum & Ossium Mollificatione*, seems to refer to the resolution or pa-

(*p*) In Schol. ad Obs. 37. A. 1. Dec. 1. Eph. N. C.

(*q*) Ad vocem *Alachad*.

ralfis of the limbs, or, as the interpreters of Avicenna say, to the *mollification* (*r*) thereof; and not to the softness of the bones.

Yet there are examples sufficiently ancient, which Fernelius (*s*), and Ruellius, whom he quotes, have deliver'd down in writing; adding, that the disease had been happily cur'd by means of aluminous baths: which method you will understand, from Sachsius (*t*), that others also had follow'd.

But as I could not learn from those cases what was the structure or nature of these bones thus soften'd, as they appear'd from dissection, by reason of firmness being restor'd; so neither have I learn'd this circumstance, in the manner I hop'd I should, from other cases that are generally enumerated; as, for instance, from those that are mention'd by Jacobus Hollerius (*u*), by Guilielmus Fabricius Hildanus (*x*), by Peter Borellus (*y*), by Thomas Bartholin (*z*), and by Daniel Prottenius (*a*).

And, indeed, I even omit those which relate rather to a peculiar degeneracy of any one bone, than to that which is at the same time common to most of them; and among these I place that which is related from Bartholin, whom I have already mention'd, in the Ephemerides of the Cæsarean Academy (*b*).

Coming down, therefore, to those authors who have flourish'd in our memory, I first found Gabrieli (*c*), among the Italians, who, not later than the eighty-eighth year of the preceding century (for Gagliardi (*d*), mentioning the same observation briefly in the following year, has said that it was "very lately communicated" to him); who, I say, about that year, then, in dissecting the bones of a matron; none of which had retain'd their former hardness, and whose more oblong bones had almost all of them become flexible to every side; found the latter converted, not into a fibrous flesh indeed, but into a reddish flesh.

After this I read an almost similar observation of Courtialis (*e*) on another woman: and even not only all her bones, the teeth excepted; of which Gabrieli has made no mention; could be bent, but all of them resembled fungous and soft flesh, impregnated with a bloody serum.

And although I do not see, that some observations of the celebrated surgeon Petit (*f*) are of a different kind, as they speak of the bones being chang'd into a substance similar to flesh, without the neighbouring or interpos'd cartilages being injur'd, as far as he could observe; and although they have brought back to my memory, that those thick cartilaginous ligaments, which are interpos'd to the bodies of the vertebræ, were found to be quite uninjur'd where the vertebræ were deeply diseas'd by a caries (*g*); yet, as

(*r*) Vid. c. 2. Fén. 2. l. 3. Can. Avicen.

(*s*) De abdit. rer. Caus. l. 2. c. 9.

(*t*) Schol. cit.

(*u*) In adjectis, l. 1. de Morb. Int. Raris quibusd. n. 7.

(*x*) Cent. 1. Obs. Chir. 45. & Cent. 6. Obs. 74.

(*y*) In fine Epilog. additi ad Cent. 4. Hist. & Obs. Med. Phys.

(*z*) Cent. 6. Hist. Anat. 40.

(*a*) In Act. Med. Hafn. Vol. 3. Obs. 24.

(*b*) Obs. 37. supra cit.

(*c*) Eph. N. C. Dec. 3. A. 2. Obs. 3.

(*d*) Anat. Off. c. 2. Obs. 3.

(*e*) Hist. de l'Acad. R. des Sc. A. 1700. Obs. 2.

(*f*) Mem. de la même Acad. A. 1722.

(*g*) Epist. 40. n. 26. & 29.

these observations of Petit never speak of that disease as occupying many parts at the same time, and always as being join'd with a tumour, they cannot be referr'd by me to the species whereof we are speaking.

And the same must be said of many others; as, for instance, of that which is from Mauchart (*b*), of the upper parts of the thigh bone being grown large, and so soft as to yield to the handle of the knife, and even to the fingers; and, when press'd, to emit a kind of bloody medulla, similar to that which is in the small cells of the bones: or of that observation which is twice publish'd from Nebelius (*i*), of a disorder which consisted in the much greater part of the same bone being converted into a large, whitish, and spongy mass; except that a great number of small lamellæ remain'd divided within it, and the medullary system was semi-lacerated and become empty: the whole being surrounded by a white, hardish, and even almost cartilaginous membrane, which was suppos'd to be the periosteum.

A membrane of this kind, you will also find, was met with by Alexander Camerarius (*k*), surrounding tumours, under which, in a ricketty boy, certain parts of the ossa humeri and femoris were so consumed and wasted away, as to have degenerated into a fluid matter; not at all foetid, of a white colour, and almost like coagulated milk: which disorder he therefore call'd "the white caries of the bones."

If you have the dissertation of Platner which is intitled, *De Thoracibus*; you will be able to see, whether, and how far, those words of that dissertation which I have read in the *Acta Eruditorum* (*l*) relate to this subject: "That the bones, in those who are pretty far advanc'd in life, are sometimes so preternaturally soften'd, and become waxy and fragile, as to be fluid as if melted down; and this was found, by his own experience, in the right os innominatum of a certain man."

Finally; to return from fluid bones to those that are easily to be cut with the knife; there is extant an observation of the illustrious Haller (*m*) upon the fibula; which, without any change in the periosteum, being become quite fleshy, or similar to soft cartilage, was made divisible by a knife, in the same manner as pretty hard cheese: being tumid, and internally eroded by a foetid ulcer.

All these observations; though, for one or other of the reasons mention'd above, or for both of them, they do not relate to the subject in question any more than the observations of Petit; I, nevertheless, was not willing to pass over: as I do not doubt but you may sometimes transfer these appearances, that are found in particular parts, to those which will occur in many at the same time, or in almost all, in order to explain them thereby.

But now, to refer the observations of Gabrieli and Courtialis, taken notice of above, to that species of disorder which we have undertaken to consider here; as the observations are very similar to that given above from Valsalva in this respect also, that pains of the whole body had preceded this state of

(*b*) Eph. N. C. Cent. 9. Obs. 30.

(*i*) Act. N. C. Tom. 1. Obs. 15. & Tom.

5. Obs. 111.

(*k*) Tom. cod. 1. Obs. 53.

(*l*) A. 1751. M. Sept. P. 2. ex ejus Dissertationum, pag. 139.

(*m*) Opus. Pathol. Obs. 54.

softness in the bones; it is certainly surprizing, that, after so great a similitude of disease while those three women liv'd, so great a dissimilitude should be found in the bones after death: so that, although in two of them they resembled flesh, in one they were become spongy and carious, yet, nevertheless, still remain'd in the form of bones.

But a much greater dissimilitude (unless you should chuse rather to account for this, and others similar thereto, from the excessive progress of the disorder) occurs in that instance which is made mention of by Boerhaave (*n*). For a man, who had liv'd with his bones in a state of softness, and not without the most severe pains, had his bones, after death, "similar to a pultaceous substance, and such as is prepar'd from bones in Papin's digester."

And this being the state of the question, you naturally see that, if at any time disorders of this kind recur, the physician must be very cautious in predicting what will be the state of the bones; as the state was found to be so very different in the four bodies after being affected by these disorders.

7. And of these three, the species of disorder which was found by Valsalva cannot be referr'd to that constitution which physicians have sometimes observ'd, but particularly from the lues venerea; I mean, a caries which has proceeded so far, that the bones may be easily broken in the dead body, or by any motion whatever of the body while living: more than one example of which kind, (not to digress too far in pointing out what Blawius (*o*) and others have publish'd) you have, in this ninth section of the Sepulchretum (*p*), and in the fifth (*q*) of this very fourth book.

For in the woman of Valsalva's in question, the bones indeed were spongy on their surface, and carious; but in other places at the medullium, and in the whole part which lay betwixt the medullium and the surface, they were without a caries. They were not broken, therefore, but bent; and by that means shew'd that the fibres were not in great measure eroded and destroy'd, but soften'd.

Yet from whence this softening? For if they had been made fleshy, or pultaceous; you would have the most ingenious men to follow in their conjectures, that into the place of the bony particles, which are suppos'd to be rubb'd off, and carried away, from the bones; even in healthy persons; new particles of the same kind are not supplied, as they ought to have been: but particles of a totally different nature, which can never coalesce into the hardness of a bone.

If, therefore, it is your pleasure also to indulge yourself in conjectures; you must here endeavour to think of a humour, which, when carried into the bones, could soften them. For without the body; that is, when the bones are much more rigid; Ruyfch (*r*) has shewn the possibility of doing this, when he has said that, by means of a liquor wherein he had preserv'd the ribs, and which was made pretty acid, these bones were soften'd to such a degree, that they could be distorted into a spiral figure; just as we would a

(*n*) Prælect. ad Instit. § 401.

(*o*) Eph. N. C. Dec. 3. A. 7. & 8. Obs.

151.

(*p*) Obs. 1. § 13, 14.

(*q*) Obs. 1. § 2. & Schol. ad § 10.

(*r*) Thes. Anat. 6. n. 13.

cord : and this he afterwards confirm'd by macerating others in an acid liquor ; for he could reduce them (s) into the form of the letters C. and P.

And in the second of his *Adversaria* (t) he has asserted, not only that the ribs become soft and flexible, from a similar maceration ; but also that the human bones in general were thus changeable : and, indeed, he has expressly added the following words : “ Does it from hence appear in what manner “ that memorable disease was brought about, wherewith a virgin, in France, “ being affected, had all her bones soften'd down like paste ? ”

But as in those former experiments he has only mention'd the ribs of *infants*, and here, with the same view, the bones of *children* ; you may add to these the bones shewn by Hunauld to the Royal Academy of Sciences at Paris (u), which, being macerated in vinegar, were become soft by that means : and because it does not appear from what bodies these bones had been taken, you may join with them the instances which were related to the same Academy, by the two celebrated men Fauchy and Geoffroy (x), of two ivory spoons ; one of which having been left in milk for a long time, through forgetfulness, and consequently in milk that was become acid, was found to be flexible like leather : the other, which was small, and seen by the Academy itself, had been made flexible, like horn, and pellucid ; after having remain'd a long time in that kind of sauce which we call mustard.

But, to return to vinegar, I would also have you attend to this ; that when those bones which Hunauld shew'd to the Academy, had been soften'd by vinegar, they recover'd their former hardness by being macerated in water ; and, again, lost that hardness in vinegar : and from all these circumstances, and from that I have taken notice of above (y), of aluminous baths, which have restor'd lost firmness to the bones of living men ; you may take a new argument of the various and manifold causes, and also of the various and manifold disorders, whereby the bones may be made flexible : for, certainly, if they had been fleshy, or pultaceous, there could have been no room for any remedy whatever.

And if it were determin'd universally, that the bones in ricketty children were of a waxy flexibility, and Mayow, as you even have it in the *Sepulchretum* (z), did not contend that they are “ rather more firm than in “ others ; ” I should have taken notice of some external remedies here, which are said to have been useful to such patients, and have compar'd them with the experiment of Hunauld.

But as, in order to explain the curvatures of the bones which are in those children, it does not seem absolutely necessary to suppose that waxy softness of the bones ; since it is quite sufficient that they are much less hard than in adults, as that age requires ; so that, by the prevailing force of the muscles, which belong to one surface of the bones, they may be bent to that side, as has been shewn on another occasion (a), where I have also spoken of the skeleton of a young girl propos'd and explain'd by Mery (b) : I, therefore, did

(s) Thes. Max. n. 164. & Thes. Nov. n. 129.

(t) C. 6.

(u) Hist. A. 1742. Obs. de Phys. & c. 7.

(x) Ibid. & Hist. A. 1743. Obs. de Phys. & c. 13.

(y) N. 6.

(z) L. 2. S. 12. in fin.

(a) Epist. 27. n. 33, 34.

(b) Mem. de l'Acad. R. des Sc. A. 1706.

not think that the bones of this young woman, which were so curv'd in the limbs, and the low stature in consequence thereof, had any reference to this subject; notwithstanding similar circumstances to these have happen'd in those persons whose bones I have said were made fleshy or pultaceous; nor yet that the shortness of dwarfs, by reason of their bones being distorted from the rickets, have any relation to the point in question: although I know that not all who are dwarfs are ricketty.

For if you can possibly doubt, whether any persons are born with a very short body, and grow very little, and yet have their bones strait, and all their limbs corresponding to each other in proportion; you may be convinc'd even by that last example, which you will read in the history of the Academy that I have commended (c), of a boy who was now five years of age, and yet not longer than two-and-twenty inches.

But now; before we pass on to other things; I choose to add, to those causes which we have spoken of above, of flexibility, and of fragility, in the bones, the following things also. Dominic Gagliardi (d) has suppos'd that the bones are made soft, and consequently fragile, in those bodies, wherein they have happen'd to be naturally less hard than in others: and that they are not of the same hardness in all persons, but more or less hard in different persons, according to the various degree of the coagmentation, and consolidation of the bony juice; which perhaps might be confirm'd from thence, that they much more frequently become soft in women, than in men: and that this bony *gypsum*, as he call'd it, is soften'd, in consequence of its being *alkaline*, by the acids which are thrown into the vessels of the bones; and that from hence it is that persons subject to "rheumatic and arthritic pains," but particularly to pains from the lues venerea," are also subject to have their bones become soft.

And by these means he, in some measure, led the way to the experiments of those persons, who, as I said just now, affirm'd afterwards, that the bones are soften'd by means of acid liquors. And that it has more than once happen'd to rheumatic and arthritic patients, to have their bones become flexible, we learn from several observations; to which you will also add that of the celebrated Targioni (e), on a woman, in whom the vehemence of arthritic pains had distorted the ossa humerorum, the ulnæ, and radii, into the form of an arch.

But as to the humours being infected with acid particles, in the disorders which Gagliardi has made mention of; as this cannot be prov'd by every one; you will only admit of the argument from him as far as you think proper, and leave the rest undetermin'd.

Moreover, in regard to the fragility of the bones, the celebrated Lovisius (f) shows, that this is not always brought on by a caries. For when he dissected the body of a woman, who had broken the os humeri, and soon after the os femoris also, by a slight effort, he found the bones "not carious," but dry, and fragile; and the medulla, in like manner, dry, friable, and

(c) A. 1746. Obs. Anat. 8.

(d) Obs. 3. supra ad n. 6. cit.

(e) Prima Raccolta d' Osservaz. Med. nella

Descriz. d'un Tumore Follicul.

(f) Vid. Act. Erud. A. 1751. M. Jun.

P. 1. ubi de ejus Observationib.

“ quite loose from the parietes of the bony cavities.” And this woman was actually sixty years of age ; but of a pretty fat habit of body : full of health besides, and alacrity ; except that she had already labour’d, for some time, under a cancer of the breasts.

But now take the other history of Valsalva’s that I have promis’d you.

8. A man, who was a native of Bologna, had been afflicted with pains, in consequence of the lues venerea, which return’d every day at a certain period. These pains were very violent at the diaphysis of the tibiæ, and at the ankle-bone at the same time ; where a small, and somewhat soft, tumour was perceiv’d by the fingers, and by the eyes. Internal and external remedies being made use of in vain, Valsalva applied the scalpel, and gave the wish’d-for relief.

For having open’d, and laid aside, the common integuments ; and taken away a small quantity of yellow jelly, which was interpos’d betwixt those integuments and the subjected tendons, and made up the tumour ; the pain in the ancle did not return on the following day.

However, as the patient said that he was prick’d with needles as it were, if the neighbouring tendons were by any means press’d upon ; it was easily conceiv’d that some part of that jelly lay hid beneath them : which, at length, being wholly, and dextrously, taken away quite from the very bone, without injuring the tendons, that sense of the pricking of needles vanish’d also.

But the pain in the tibia remain’d, contrary to expectation ; for it was suppos’d to be produc’d by consent of parts. The periosteum, therefore, was laid bare by the knife ; and was found to be not quite in a natural state : so that it was necessary to procure a separation thereof from the bone, which was in other respects sound. This being done, no pain any longer remain’d : and the wounds being easily brought to a cicatrix, the patient was dismiss’d in good health.

9. When Valsalva related this observation to me ; for he did not leave it in writing ; I remember him to have added, that other similar tumours, from a venereal cause, had also been cur’d by him in the same manner ; so that neither they nor the pains return’d afterwards. And he class’d them among the venereal gummata, as they are call’d ; thinking it by no means necessary, that they should all arise under the periosteum, or be comprehended in a peculiar coat.

Nothing is more similar to the observation in question, than that of Fabricius ab Aquapendente (*g*) ; which has been already taken notice of by me also ; except that the tumour was not at the ankle, but at the wrist, and brought on severe pains every day, at a certain hour : being made up, as he found by dissecting out the tumour, of a small quantity of vitreous pituita, according to the manner of speaking made use of at that time, lying in contact with the internal tendons.

And I suppose that Nicolaus Massa referr’d to a matter of this kind, when, in the carcases of those persons who had been afflicted, while living, with the venereal disease ; and he had dissected a great number ; he asserted, as you have it in the Sepulchretum (*b*), that he had found “ the painful places to

[*g*] De Chirurg. Oper. ubi de Articular. Ust. (*b*) Sect. hac IX. Obs. 1. § 1.

“ be moist with a pituitous matter :” and this Fracastorius (*i*) also ; where he asserted his having found out the cause of the pains which afflict venereal patients by night, from the same lues,” by making a number “ of dissections ;” spoke of under the title “ of a kind of lentor,” which he had seen upon the tendons and muscles : and he has expressly asserted, “ that gummosities are made up of concremented phlegm.”

Nor is it of any importance that Fabricius has not said whether the tumour which he cut out was venereal ; for he acknowledged gummata(*k*) to be frequently, but not always, from that cause.

However, I would rather you should of yourself doubt, whether two anatomists, and at the same time very excellent surgeons, Fabricius and Valsalva, were not themselves also at those times deceiv’d, when both of them suppos’d that the tendons, and the latter of them even that the periosteum, were affected with these pains ; I say, I had rather you would of yourself doubt, than that I should give out the suspicion.

But that gummata are not always seated betwixt the periosteum and the bone ; although you should not digress from this section of the Sepulchretum ; you will naturally conceive : and not only from Rhodius (*l*), who, in this very theatre of ours, saw “ three white gummata” demonstrated by Anthony Molinetti, upon opening the cranium, “ and these gummata adhering “ to the dura mater ;” but also from Guarinoni (*m*), who asserts, that he “ had seen the gummata spoken of concremented in the brain.”

This situation I mention in particular, because these things are added to this author’s observation, wherein “ three little bodies, like venereal gummata,” are said to have been seen in the brain of a man ; who having been subject to epilepsy, and convulsion, after the lues whereof we are speaking, was, at length, carried off by a very heavy sleep.

And as this cause, and these disorders, are likewise read of in a history which I have written to you some time ago (*n*) ; you may compare them one with another, and consider again, if you please, of what I then left undetermin’d (*o*), in regard to that small and roundish abscess within the cerebrum ; I mean, whether it belong’d to the class of gummata, or not.

And while you are doing this, you will, at the same time, call to mind those gummata of the head, which generally begin under the integuments of the cranium, and erode the bone, unless they are attended to in time ; as the same history shows ; since observations of this kind are here wanting in the Sepulchretum : with which otherwise it might have been increas’d ; and amongst these with that which the celebrated Heister (*p*) has produc’d, together with the dissection of the body after death.

10. For the two remaining observations of Valsalva, which I have given, I will subjoin as many of my own that remain behind ; beginning with that which is particularly requir’d by the discourse I have begun, upon a caries corroding the cranium. For that this spreads far and wide, unless you pre-

(*i*) De Morb. Contag. l. 2. c. 12.

(*k*) l. cit. ubi de Gummatis.

(*l*) Obs. 1. §. 9.

(*m*) in Schol. ult. ad Additam.

(*n*) Epist. 9. n. 23.

(*o*) n. 24.

(*p*) Dissert. de Off. Tumorib. n. 15.

vent it in time, I have even seen without the dissection of the body, and you will conceive.

11. An old woman, in the hospital of Incurables at Bologna, had so much of the left os sincipitis, and the neighbouring os frontis, consum'd by a venereal caries, that the brain was laid open by a foramen of three fingers breadth in every direction; and you could plainly see, while you felt the artery at the wrist, that this artery and the brain rais'd themselves up, and subsided, at the same point of time.

And lest you should doubt of this, I saw her frequently in that year, which I think was 1700; for the woman did not live there a little time; although the eroding virus was not yet entirely overcome, nor the ulceration, which was external about the edges of the foramen, was drawing on to a cicatrization. But the membrane of the cerebrum itself appear'd to be clean and bright in its colour.

12. It does not escape me that the cranium is consum'd for a much wider space, if the caries goes on, as; to omit others; I have read our Fallopius (q) saying, "that the whole sinciput is sometimes corrupted; and "sometimes also a part of the occiput: and at other times that the whole "skull is corrupted, and taken away; and this," says he, "I have seen "first in my mother's sister, who had receiv'd the lues venerea from her "husband: and I took away from her the whole cranium: the membrane "is cover'd with a kind of pellicle; and the pulsatile motion of the dura "mater is always perceiv'd." And he adds, that "he had many other ex- "amples of the same kind, both here, and in other places."

But in that old woman, there was not a manifest pellicle which cover'd the meninges: and the part even appear'd as if the dura mater had been taken off, and we were looking upon the brain when cover'd only with the pia mater, having a reddish, smooth, and moist surface. I could not, therefore, sufficiently admire, how the humour, which had been able to erode the bone, had not injur'd, in the least, that membrane; and how it was that the woman labour'd neither under convulsion, paralysis, nor any other mark of injury in the brain, or its membranes: although whether she had labour'd under these symptoms before, or not, I cannot inform you.

Nor was Hildanus less surpriz'd formerly (r), that no symptoms of injury done to the spinal marrow, were present in a man who had it "laid quite "bare, and cover'd over only with its membrane;" whereas three of the bodies of the thoracic vertebræ were destroy'd by the caries.

And, indeed, these things are more surprizing than that the muscles, which lie upon the bones, or the integuments, should, sometimes, not be injur'd by the humour which erodes the subjected bones both internally and externally, without any external tumour, or discolouration betraying the disorder: which circumstance miserably deceives incautious lovers, who are ignorant that under a fair appearance of body, though not disfigur'd in the slightest degree in any part, even the most considerable caries may lie hid; an example of which kind is particularly to be read in Novesius (s), from

(q) Traët. de Ulcer. c. 47.

(r) Cent. 5. Obs. Chir. 56.

(s) Letter 6.]

whom it might be referr'd into the Sepulchretum, with the approbation even of Guilielmini (*t*).

When Benivenius (*u*) formerly propos'd an instance of the os frontis being almost wholly consum'd (but by a caries of another kind, as it is natural to suppose), without any mark being conspicuous externally; he made use of the example of thunder, which sometimes melts gold without injuring the case wherein it is kept; or does other things of the same kind, which Marcellus Donatus (*x*) adds, when he relates the observation of Benivenius.

But others choose rather to make use of the example of aqua stygia, which destroys iron, for instance, but does not touch suet. You may either devise some other comparison, or follow these authors. For it will not only be of use in the cases in question, but in others also.

So our Fabricius (*y*), in a boy; Matthæus Blawius (*z*), in a man; so Jo. Jacob Scheuchzerus (*a*), in a woman; saw the skull entirely perforated, in more places than one, by a corroding caries; and yet the dura mater unhurt: so as to make it evident, that the acrid and corrosive humour, to use the words of Fabricius, was "contrary to the nature of the bones of the head, but by no means to that of the subjected membrane."

But lest you should suppose this to happen in every caries of the cranium, you may learn the contrary from many observations; and among others from two of Laubius, one on a woman (*b*), the other on a man (*c*); in both of whom the cranium was so consum'd, by a caries, to a considerable extent, or perforated thereby, that the corresponding parts, not only of the meninges, but of the cerebrum itself, gave access for the pus, quite to the lateral ventricle, and the right ventricle in both: although in the woman, there at length came on a paralysis of the subjected side; which had already existed for a long time in the man: and, as it is then wont, for the most part, to be, on the left side.

And as I have spoken sufficiently of this difference already, on other occasions; you yourself will consider of the other, which relates to the present subject: that is to say, why the eroding ichor of a caries should vitiate the meninges of some persons, and leave those of others unhurt? Is it because, in the last-mention'd cases, it has a free discharge outwards; and in the former has not? Or, because in the latter it is infected with a venereal virulency; and is not in the former?

But as cases are not wanting to be repugnant to either one or the other of these explanations; as to the first, that which has been propos'd by Blawius, in a man; as to the second, that which has been propos'd by me, in a woman; you are certainly under a necessity, at other times, of accounting for it from some certain nature and disposition of the ichor, and the bodies affected therewith. But I go on to my other observation, such as it is.

13. A butcher, of forty years of age, who was infected with a venereal lues, and frequently intoxicated with wine, had been, for a long time,

(*t*) Reponse 6.

(*u*) De abdit. &c. Morbor. causis c. 18.

(*x*) Medic. Hist. Mirab. l. 5. c. 1.

(*y*) De Chirurg. Oper. ubi de Gummatib.

in fin.

(*z*) Eph. N. C. Dec. 3. A. 7. Obs. 151.

(*a*) Aët. N. C. Tom. 7. Obs. 47.

(*b*) Eph. cit. Cent. 8. Obs. 21.

(*c*) Earund. Cent. 9. Obs. 14.

subject to disorders of the thorax, and had been in this hospital, on that account, at other times. Last of all, returning into the same hospital, besides an acute fever, on account of which blood had been twice taken away, (which neither the first nor the second time was without a polypous crust) he was afflicted with a continual cough, which attack'd him so violently three or four times every hour, that he became livid therefrom: he expectorated purulent matter: and had a vibrating pulse.

Having been thus affected about fifteen days; last of all, his strength decreasing more and more, within one day, he ceas'd to live about the end of January, in the year 1747.

The body; if you except some parts of the thorax; I had not in my power to examine at that time, being taken up with other things relative to the public demonstrations of anatomy, The lungs were half-rotten, and smelt very strong. The heart was lax. In one of the valves of the great artery, the corpusculum Arantii was much larger than it naturally is. And under it, on that surface where the valve was turn'd towards its fellows, the membranous laminæ, of which it was compos'd, were so disjoin'd to a considerable tract, that where they open'd I could introduce a probe betwixt both. And the neighbouring trunk of the artery was distinguish'd, here and there, internally, with whitish spots: nor was it very smooth, but even somewhat unequal. And, soon after, being distended into an aneurism of the curvature; I was, for this reason, less surpriz'd, as I have said heretofore (*d*), at what I observ'd in that valve.

14. Although, for the reason just now mention'd, I could not sufficiently compleat this observation; yet I was willing, however, not to pass it by, that you may join it with the others referr'd to in the beginning of this letter (*e*); whereby we have shewn, that the lungs are frequently injur'd in a lues venerea; and that the great artery is sometimes injur'd from the same cause, and dilated into an aneurism.

Perhaps, we should also have found the kidneys to be diseas'd in that man. For these four parts, the lungs, the aorta, and the kidneys, together with their appendages, we have found to be injur'd; in those who have labour'd considerably, and for a long time, under this lues; somewhat more frequently than you will easily imagine from the reading of most books.

But as to that viscus, which very learned men had formerly said was affected more than others, and indeed was the seat of this lues, as you see from the Sepulchretum (*f*); to which, however, others do not assent, as you will learn from the same book (*g*); I mean the liver; I do not, at present, remember that it ever appear'd to me to be vitiated in these bodies.

Yet I shall not for this reason deny, that those things which happen rarely, or never, to me, might not have happen'd frequently to others; or, on the contrary, that those things which happen frequently to me, might not have happen'd rarely to others: for I mean nothing else here but to inform you what I have happen'd to meet with the most frequently; as I very well

(*d*) Epist. 27, n. 7.

(*e*) N. 2.

(*f*) Obs. 2. § 1, 2, 3.

(*g*) Ibid. § 4, 5. & Obs. 4.

know, that this lues, since it may sometimes lie hid under the mask of any disease whatever, may also vitiate any viscus whatever.

But what viscera it really affects more frequently, or what less frequently, you cannot easily determine, before many observations of different persons are compar'd together. Yet I cannot help being surpriz'd, that, as so many are infected with this disease, and so many die, the dissections by no means correspond to their number. And, certainly, you will not see a great number transferr'd into this section of the Sepulchretum.

The section, therefore, is short; and so much the shorter still, because the whole of it is not of the lues venerea, but also of the *plica polonica*: and where it is upon that subject, it consists in great part of scholia, one of which is not even found in its proper place; as, for instance, that which is affix'd in the third place to the first article of the first observation, wherein there is nothing of "tumid and suppurated bones;" whereas it belongs, as far as I can judge, to the eleventh article, which is three pages distant from thence: and almost all the scholia are from Sylvius; who endeavours to build up his theory of the acid nature of this poison; out of which some things might have been omitted, and others have been substituted in their places: as, for instance, when he has conjectur'd (*b*), that bubos arise in the inguinal glands, because "they are near to the spermatic vessels."

They judg'd better, who said formerly with Brasavolus (*i*), "that a kind of deprav'd quality ascended, by the penis, to the emunctories, and to the glandular parts of the groins; and excited bubos there." For although they did not point out the way which led into these glands; they did not, however, propose a passage which did not lead thereto.

What passages can lead to these glands, finally, William Cowper shew'd six years before the Sepulchretum came out with its Additamenta; among which this ought to have been put, as you have read in our Adversaria (*k*), where we have transferr'd the same conjecture to women also: and have made use thereof, since that time, in consultations where the question was of bubos, that had succeeded to erosions of the glans and præputium, degenerating into deep cancerous ulcers; as I have more than once seen.

Yet remarks are not wanting in these scholia that seem to be owing to dissections; as that (*l*) of the venereal infection arising from the loculi of women, "quite to the cornua uteri, corrupting them, and exciting ulcers there:" which exceedingly well agrees with the observation of our Vallisneri (*m*) on a woman, in whom, in consequence of the same lues, not only all the loculi, but the whole right tube also, was ulcerated.

By those appearances that have been seen by Vallisneri in the viscera of women, and by Genselius (*n*), by Salzmann (*o*), by Caspartus (*p*), by Pet-schius (*q*), and by others, in the viscera of men also, and in other parts of those persons who had died after this disease, you may increase the number

(*b*) Schol. ult. ad § 4. Obs. 1.

(*i*) L. de Morbo Gall. ubi de Caus.

(*k*) IV. Animad. 22. & 27.

(*l*) Ad § 4. cit. Schol. 1.

(*m*) Ist. della Generaz. P. 2. c. 5. n. 21.

(*n*) Eph. N. C. Cent. 6. Obs. 84.

(*o*) Act. N. C. Tom. 2. Obs. 99.

(*p*) Dissert. de Exost. cran. § 8. ubi num Aortæ aneurisma.

(*q*) Syllog. Anat. Obs. § 87.

(which,

(which, as I have already said, is not very large) of observations that are contain'd in this section of the Sepulchretum.

15. Nor does it escape me, that a book has been publish'd, in our age, "on the diseases of the pudenda, and the lues venerea;" wherein you have many observations, relative thereto, made even upon dead bodies. But whether these might, as well as those just now spoken of, be referr'd into the Sepulchretum, I do not very well know. Yet I do not say this because I doubt the author's veracity, but because I do not know how far his eyes, and his diligence, are to be depended upon.

For there are some things that he has affirm'd he had seen in other writings, which others believe he had seem'd to himself to see, though they themselves could never see them. And things of this kind are not wanting in his book; as, for instance, when he says that the *uterus* is *interpos'd* betwixt the *intestinum rectum* and the *lacunæ* of the *vagina*: that the *peritonæum* *rises up and is superextended* upon the *inguinal glands* on the external part, that is betwixt them and the *skin*: that the *lymph* is *carried by the lymphatics of the mesentery to the glands of Peyerus, that is, to the intestinal glands*: that the *pancreas Asellii* is in the human *mesentery* also; for he says that, in those who have died of a *lues venerea*, *the pancreas of Asellius is reduc'd to nothing*: and other things of a similar kind, which I purposely pass over.

And at the same time that he sees those things which others do not see, he, on the other hand, does not see, or does not know, what others see and know; as, for instance, when he writes, that in the *vesiculæ seminales* *nothing anfractuouse or contorted is contain'd, by means of which some delay to the semen may be pretended*: or where he says, *of a mucous body betwixt the cuticle and the skin, I find no mention made among anatomists, except those of Montpellier*: and to this, moreover, *Polfenus first attributed the colours of the skin, but, in particular, the blackness of the Æthiopians*.

But he, who does not seem to have read Malpighi (r), and others after him, who teach the same things, takes a great deal of pains, in producing authorities from many writers, both medical and not medical, to persuade us to embrace an opinion which has been confuted by a much greater number of authorities; I mean, that the *lues venerea* is a very ancient disease, and, finally, nothing more than the *elephantiasis*.

This I suppose he would never have attempted to prove, if he had then had it in his power to read that very learned and able physician John Astruc (s), by whom these persuasions are entirely rooted out; although this, however, is surprizing, that he, who was not ignorant how great, and how immoderate a mixture of nations there was formerly in the Roman stews, while the power of the Cæsars was at its height, should have suppos'd that there was the same *lues* at that time; but divided by physicians into many disorders, and not consider'd as one disorder, before "a collection of them" all "was observ'd in the camp at Naples:" as if there had been a greater mixture of nations in those camps than formerly at Rome, where one and the same harlot (as Martial (t) confesses in so many words) prostituted

(r) De Ext. Tract. Organo.

(t) L. 7. Epigr. 29.

(s) De Morb. Vener. l. 1. c. 1. & seqq.

herself to Catti, to Germans, to Dacians, to Cilicians, to Cappadocians, to Indians, to Jews, &c.

The American nation was the only one then wanting at Rome: and in these camps were not wanting such as had commerce therewith themselves, or, at least, by means of others; so that it may be easily conceiv'd from whence, not a new collection of diseases, but the lues itself, came into Europe.

And you may not only observe a great negligence in these things, but also in the enumeration of the years from that time; which is in other respects very easy; and in the reading of the best physicians from thence quite down to the present age; where it is soon after said, that the lues venerea "had already lasted, under this title, more than three hundred years, and had even remitted nothing of its atrocity;" since it is certain to every one, that this Neapolitan war had not begun before the year 1494: and by the author whom I have before quoted, I mean Astruc (*u*), so many authors are produc'd; and, amongst these, some who, as they were celebrated physicians, so their writings are in the hands of almost every one: by the testimony of whom it is very evident, that this disorder is become more slight.

After these remarks, and others which for brevity's sake I omit; and, amongst these, that next prognostic aphorism, "a fever, succeeding to a lues venerea, solves the disease;" I would have you yourself consider, whether we can ascribe so much to his eyes, and to his diligence, as to admit of all his observations without any the least doubt or hesitation.

16. Do not, however, imagine that these things are said by me for any other reason than from a desire after truth: as they are of an author who was not known to me while he was living, either on the score of injuries or benefits; and in whose book I do not deny that there are also some good things. But do not ask me, whether in that method, likewise, whereby he taught that this disease is to be overcome.

For from the time that this disease was known to physicians, that different methods of cure have been us'd by different persons, and what had been formerly made use of has been deserted in the same places, and that which had been exploded substituted in its room, in this disease more than in any other, I suppose no-body can be ignorant; so that, if you approve of any thing in preference to others, or disapprove any thing, it is to be fear'd that, on the contrary, others may disapprove or approve it: and not only of those who are to come after us, but of those who are living at present, in so great a mutability and diversity of opinions.

For in regard to the two most celebrated remedies against this disorder, the decoction of the woods, as it is call'd, and quicksilver, how many dissensions and different opinions do still subsist? and not only which is to be preferr'd to the other, but, if you prefer one to the other, in what manner this is to be made use of.

It is certain, that, in the very beginning of this disorder, the mercurial unctions were applied: and, afterwards, that the decoctions of the woods

(*u*) L. cit. 1. c. 14.

were preferr'd to them : and that mercury was again made use of internally ; and yet that the decoctions of the woods had not, for this reason, become so exploded, as not to be still had recourse to in some cities in particular : nay, these only were preserv'd, and both the methods of using mercury rejected entirely ; till, at length, in the same cities, they again return'd to one or the other method of using mercury, where a very violent lues did not yield to the decoction.

I remember, when I was quite a young man, and went to Bologna, that both methods of applying mercury were so far deserted, that I never saw any physician make use of it ; or even heard of his using it (for the whole space of eight years, during which I studied physic there) in either one or the other way ; and that was very surprizing in the city where Jacobus Berengarius Carpenfis had formerly flourish'd, and had been fam'd for the use of mercurial unctions, which he was one of the first promoters of, if not, as most authors imagine, the first inventor : certainly if he was born some years before 1467, as that passage of his, which has been produc'd by me in a former work (x), seems to show ; he was of such an age, when the lues venerea was first known in Europe, that he may be suppos'd to have made use of this method in the very beginning.

But how much mercury had not only begun to be suspected, but to be very rarely applied, at Bologna, before I went to reside there ; to omit some of the more ancient of the Bononian writers ; sufficiently appears from the *Empirica Rationalis* of Claudinus (y), where he speaks of both these methods of using mercury : and not only of the fumigations thereof, which are very frequently pernicious ; and therefore not so much as mention'd by me at present.

What remedies then, have you seen those very excellent physicians make use of, you will say, against the lues venerea ? Why the decoction of woods, either in the common method of giving them ; and this for the most part ; or in another way, wherein I have seen them us'd by Valsalva, and that frequently.

For having observ'd some persons to take in a great quantity of that decoction which they call Aqua Stibiata, or Aqua Corsi, with success ; he said, that it came into his mind to make use thereof, in the same manner that we generally make use of bath-waters. That he had therefore given it, at first, to the quantity of two or three pints, and observ'd whether it was easily discharg'd, and by the way of the bladder ; not through the intestines, or the skin, as it sometimes is. For if it was not easily discharg'd, or if by these two last-mention'd ways, that he desisted. But if it pass'd off easily, and only by the urinary passages, that on the following day he had increas'd the quantity, and so on more and more, till it came to ten pints. And that by this means he had gain'd great advantages in a little time ; so that sometimes, within not more than three days, he had seen old ulcers heal'd, and gum-mata depress'd ; as in a certain knight, for instance, whom he particularly mention'd to me.

(x) Epist. Anat. 6. n. 2. in fin.

(y) l. 6. S. 2. tr. 1. c. 3.

And certainly by this method of cure I myself saw a woman made perfectly well, who had suffer'd, for the space of two years, under venereal ulcers; one that was very large in her knee, and three or four in her palate, which were small ones indeed, but such, nevertheless, as suffer'd the aliments to pass from the mouth into the nostrils, to the very great inconvenience of the patient: and I saw, in like manner, a gentleman, a fellow-citizen of mine, cur'd thereby, in whom, from the same cause, the hypogastrium and the thighs were cover'd with foul ulcers, to a very considerable extent.

And as this happen'd in the few days of drinking these decoctions, I could wish those persons to have been present, who, by reason of the very quick discharge of a great quantity of bath-waters, by the bladder, have imagin'd to themselves certain passages, whereby these waters might descend into the bladder, without mixing and circulating with the blood; for unless this decoction had been circulated with the blood, and carried to all parts of the body, it could not so soon have heal'd those parts that were ulcerated, or otherwise diseas'd.

However, the same thing that came into the mind of Valsalva, in regard to the use of a stibiated water of that kind, had formerly come into the mind of Johannes Manardus (z), in regard to the decoction of guaiacum; for he says, “ Among the various uses of this wood, I most approve of that
“ method wherein the decoction of it is drunk, in the manner of medicated
“ waters, or whey spoken of by Dioscorides. For from thence comes the
“ manner of drinking medicated waters, which is made use of among the
“ Italians in general; that is to say, of drinking four or five pints at in-
“ tervals.”

And this method of using the decoction is so far approv'd by our Massaria (a), that he wonder'd how it could happen, that nobody, quite to his time, had follow'd “ so clear and excellent a practice of so illustrious a
“ man:” and he asserted, that he had made use of this method, more than once, “ with the greatest facility, and the greatest success;” so that the patients “ obtain'd, without much trouble, and in a few days, the good ef-
“ fects which others are scarcely wont to obtain after a great deal of uneasi-
“ nefs, and a very long course of time:” and yet it did not seem to him; as you will find by reading over the passage; of any importance which of the three discharges, that I just now spoke of, was the consequence.

But to return to my former subject; from the time that I resided at Bologna to this time; that is to say, in the space of almost four-and-fifty years; mercury was also again brought into the class of antivenereal remedies, in that city.

17. And I have observ'd, in a not much less space of time, some vicissitude in these remedies, in this city; though not so great a one. For as among physicians, in other respects very skilful, some were never wanting there that lov'd the stronger remedies, rather than the more safe; so I have heard, that though almost any method whatever of using mercury was, for the most part, far less esteem'd than the decoctions, it nevertheless was at no time deserted.

(z) 1. 14. Epist. Medic. 4.

(a) Pract. Medic. 1. 6.

From the time therefore that I came hither, except suffumigations, mention of which I do not ever remember to have heard, I know that most other methods of using mercury have been practis'd; and amongst these, even that of giving it internally: and this either join'd with such things as open the bowels, or so prepar'd, as to bring on a salivation, or even a diaphoresis: or of smearing it upon the skin, when mix'd up into the form of an ointment.

This last method, however, was more rarely us'd, and the three last not very commonly; but the decoction of woods very frequently: and these were, for the most part, prepar'd from exotic woods; and sometimes, as for instance, for the poorest patients, from our own plants; on which occasion I must not conceal from you what Vallisneri asserted to me: I mean, that having prescrib'd to a poor man who had labour'd under a most violent lues venerea, for a long time together, a decoction of the roots of bardana, horehound, and the green husks of walnuts, great sweats were brought on, and the man was perfectly cur'd.

Moreover, I have seen things chang'd gradually, and slowly, in such a manner, that unless the disease is very slight, decoctions are very rarely given to excite sweat, but mercury is very frequently given to excite a salivation; unctions being almost deserted: for the physicians alledge against these, that by this method they do not well know how great a quantity of quicksilver may enter the body, and for that reason are ignorant how it is necessary to proportion their applications.

And I wish to God, the present method of cure also made use of here, had never brought with it those violent, and sometimes fatal, disadvantages, which I know not what extollers thereof conceal, and smother, among certain fictitious positions, and exaggerated narrations, of theirs; and that it was, for this reason, to be preferr'd to all others.

But considering what has happen'd in former times, and what now happens, and what begins to happen here again, they cannot but soon expect new vicissitudes here also.

Not only the method of taking quicksilver internally, but the efficacy of certain properties thereof, (against this disorder) which was not unknown to the professors at Padua formerly, if they had escap'd the memory of the less learned practitioners; may without doubt again be forgotten: that is, when a different method of cure, and a different mode of explication, have prevail'd among most persons.

And I do not think that you will enquire what professors those were, as I know that, to mention no others, you have read Falloppius (*b*), Tomitanus (*c*), and Saxonia (*d*): the last of whom describes mercury as exhibited in more ways than one; that is with cathartics, and without them, “so as to excite a copious spitting in some persons:” and relates that this remedy was then us'd by a very celebrated professor, and physician, at Padua, Albertini Bottoni.

(*b*) Tract. de Morbo Gall. c. 79.
(*c*) De Morbo Gall. l. 2. c. 15.

(*d*) Tract. de lue Vener. c. 22.

Nor is it to be doubted, but those who succeeded afterwards in this college; though they did not make use of that precipitated mercury which Bottoni did; either us'd themselves this sublimate which is at present us'd, when properly dulcified; or at least extremely well knew, from many books which were publish'd, that this had been propos'd by physicians of eminence in order to excite a salivation.

And the efficacy of some of the properties of mercury, against this lues, was not entirely unknown by two at least of our ancient professors, Hieronymus Fracastorius, and Benedictus Victorius; for the latter of these, though pass'd over by Papadopolus, is shown to have taught here before the middle of the sixteenth century, by Tomasini (*e*); and the former, though omitted by Tomasini, Papadopolus (*f*). proves to have been a professor at Padua, in the beginning of the same century. Of quicksilver, therefore, thus Fracastorius (*g*):

*Quodque est condensum, humores dissolvit, agitque
Fortius; &c.*

“ As it is of a very dense nature, it dissolves the humours, and acts
“ very powerfully; &c.”

And Victorius thus (*h*): “ By its gravity it penetrates the skin of the
“ body, being, by some means, actuated by the heat of the body: and
soon after also, when it has enter'd the body, mention is made of its
“ gravity.”

18. I pass by other things that our Tomitanus (*i*) took notice of, as if from other persons, in regard to “ the very slender, the very small, the
“ minute particles” of which mercury consists; that I may subjoin the observation and the *consilium* of our Trincavelli (*k*) likewise, which relates to the disease in question, and at the same time to these baths of the ancient Aponus.

Being consulted for a noble matron; who had this lues join'd to many other disorders; after having propos'd other things, and come to two which seem'd to be capable of being particularly useful, the decoction of guaiacum-wood, and the bath waters; and having answer'd that the former was likely to be useful, not only against the lues, but against the other disorders also; when he goes on to speak of the waters, and their manifold use by drinking, washing, and receiving them on the body, when dripping from a pretty high place, he says; the other disorders indeed, and the causes of them, “ we
“ may hope they will perfectly overcome: but as far as relates to this lues
“ venerea, or gallica, I should believe they would be of very little or no
“ service to that: nay, if I must confess the truth, I think I have observ'd;
“ that they are generally rather hurtful, to those who labour under this
“ disorder, than advantageous.”

(*e*) Gymn. Patav. l. 3. c. 8. ad A. 1532.

(*f*) Hist. Gym. Patav. l. 3. S. 2. c. 11.

n. 55.

(*g*) Siphil. l. 2.

(*h*) l. de Morbo Gall. c. 7:

(*i*) c. 15. paulo ante cit.

(*k*) l. 2. Consil. Medic. 63.

Is not this an observation modestly propos'd? The consilium follows:
 “ But at length, to open to you the whole of my sentiments in this affair: I
 “ would make use of both remedies: and would first try the decoction of
 “ the wood; and afterwards would have her brought to Padua to the
 “ baths.” In this manner then, even in the year 1561, did the Paduan
 professors observe. And thus did they answer to those who consulted
 them.

And if any persons, less conversant in their monuments, are perhaps ignorant of that; they will not, therefore, pour darkness and shades upon the glory of their predecessors, as if they had confirm'd it by no observation, and especially by so easy a one. And indeed, that which is added to this section of the Sepulchretum, from the consultation of Guarinoni, does not seem to differ from those things which Trincavelli had remark'd.

Nor do they differ, certainly, which Andrew Bacci (*l*), a very celebrated writer upon warm baths, has said. For although he judges, that not all warm baths are noxious in this disorder (in which we must certainly give credit to his experience, and that of others, even modern, and very famous men), he expressly affirms that the Aponian baths are injurious; and he even says, “ I know that the same thing has happen'd to a certain illustri-
 “ ous prince, at the Aponian baths; I mean, that he, unmindful of his past
 “ venereal contagion, brought back upon him his old pains, from the use
 “ of the baths.”

Perhaps, likewise, you would not imagine any thing foreign to probability, if, to the other causes for which that very great concourse of patients to the Euganean baths, near Verona; that had continu'd down from the most ancient times, has now decreas'd; you should also add this; that they must not only have ceas'd to be useful to a great number, but have been injurious, in proportion as the number of men who are affected with the venereal disease, among others, either openly, or occultly, is increas'd.

But if this disease, as it was imported into Europe, should, at length, at any time, as Fracastorius (*m*) hop'd, entirely be driven therefrom; and physicians should not be wanting at that time, who might be adorn'd with great, but with just praises; I have scarcely any doubt, but the reputation of the Aponian baths; which is at present much diminish'd, indeed, for other reasons, but, on the score of their admirable properties, was never wholly lost; would again become far different from what it is in the present age, and what it will probably be for some considerable lengths of succeeding time: unless the singular skill of two friends, whom you know, in enquiring into the nature of these fountains, and their diligence in observing and publishing their effects, should, by holding up the successful instances of their use before the eyes of all mankind, allure, with a kind of new invitation, a much greater number of patients to seek health for themselves in these places.

19. Now since the love of truth has impell'd me to show what ought to be restor'd to the ancient teachers of this college; neither will I conceal this which relates to the controversy spoken of above (*n*); I mean, that they

(*l*) De Therm. l. 3. c. 2. in fin.

(*m*) De Morb. Contag. l. 2. c. 12.

(*n*) n. 15.

thought the same in regard to the novelty of the lues venerea, as most other learned men have thought: and that they denied its being known to Hippocrates, Galen, and Avicenna, with so much the greater authority, as they were more conversant in their writings than some of their successors, to whom it has seem'd differently; and, amongst these, to that otherwise very learned man Carolus Patinus.

For this author, in the beginning of the scholastic year 1687, in order to open the exercises of his office "by this paradox;" I make use of his own words (*o*); made and publish'd an oration with this title, "That the lues venerea is not a new disorder;" in which, however, the celebrated Astruc would have found nothing that had not been sufficiently refuted by him, or might not be sufficiently refuted in the same manner.

But this author imagin'd that oration never to have existed (*p*), for this reason, that Papadopolus had made no mention of it in the history of our college, where, speaking pretty much at large of Patin (*q*), he has enumerated, in a particular manner, his works.

As to Papadopolus, however, who was a very learned man, and deserv'd very well of this college; as he had not sufficient time for writing, proportionably to the multiplicity of his matter, and the largeness of his work; it is not surprising if he, undesignedly, pass'd over some things both in the lives of the professors and of the pupils, and particularly in enumerating their lucubrations; of which he has told us, in his preface, "that he has added the best catalogue he could procure, under each of their names."

I, then, as to what relates to the teachers of the several arts in particular, will not omit to supply the defect of his writings in some measure, as occasion shall offer itself: and this so much the more easily in regard to Patin, because there are, among our books, two volumes in which he has dispos'd his own opuscula nearly in that order wherein they were publish'd; and most of them corrected and increas'd, by his own hand, in the manner he intended they should have been once more publish'd.

What Papadopolus, therefore, has omitted in the first volume, are the following works: "That a physician and surgeon may, without any disgrace to his art, attend to the cure of beasts: an oration.---On the phœnix impress'd upon the coin of the emperor Antoninus Caracalla: an epistle.---An oration on the city of Vienna being set at liberty:" which two are written in the name of his daughters.---"That practical medicine is not enough esteem'd: an oration.---That a physician ought to be ΠΟΛΥΜΑΘΗΣ, or very learned: an oration.---A commentary upon three Greek inscriptions lately brought from Smyrna.---ΕΡΩΤΗΜΑΤΑ ΙΑΤΡΙΚΑ, or medical questions, in regard to the physician.--Philosophical and medical theorems upon life and death.---That the circulation of the blood was known to the ancients: an oration.---The flowers of theoretic medicine.---Public exercitations on fevers;" that is to say, not an oration, as Papadopolus was willing to prove, but a synopsis of the lectures that he was to give.

(*o*) Pag. penult.

(*p*) De Morb. Vener. l. 8. S. 17. ad A. 1687.

(*q*) S. 2. supra ad n. 17. cit. c. 35. n. 159.

And out of the other volume are omitted the following works : “ Political theses on liberty and slavery.---Medical opinions upon fevers.---The idea of the human head : an oration --An oration deliver’d in the Dodo-næan academy at Venice.---The flowers of practical medicine.---That the lues venerea is not a new disorder : an oration.---Public exercitations upon particular diseases of the thorax and abdomen.---A commentary upon an ancient monument of Marcellina, lately brought from Greece.---That in the cure of fevers, the urine ought to be attended to : an oration.---A commentary upon the ancient honorary sepulchre of Marcus Artorius, physician of Augustus Cæsar.---Public exercitations on the diseases of the head.---An oration upon specific remedies.---Medical and chirurgical flowers.”

Why Patinus did not interpose betwixt these two last writings, as the order of publication requir’d, an oration which I have by me in a separate state, intitled, “ Vain astrology altogether unworthy of the physician ;” and which he had deliver’d here, committed to the press, and afterwards publish’d ; I no more know, than why the two volumes of opuscula, whereof I have spoken, were left so neglected by him, that, unless they had come into my hands, little papers might easily have been dropp’d and lost ; for such papers he had inserted, here and there, in great number ; without being connected by means of any paste or glue ; which, besides amending some things in these opuscula, exceedingly well illustrate and much increase others.

These papers, however, have been now accurately read over by me, and collated ; and each fasten’d by glue to its proper place whereto it belong’d : so that these writings may very easily be brought out again in a second edition, as the intention of their very learned author had been, either by me, if I should at any time have sufficient leisure, or by others.

And these papers relate to the commentaries I have mention’d, some upon the sepulchre of Marcus Artorius, a greater number upon the first and second of the three inscriptions from Smyrna, and a very great number upon the monument of Marcellina. To which last is added a manuscript epistle, and not a very short one, sent by that famous man Gilbertus Cuperus to Patinus ; which, if I am capable of judging, is worthy of them both.

Nor do I doubt but Patinus intended to have publish’d this also, as he had laid it amongst his papers ; if an aneurism of the great artery, by which I suppose him to have been kill’d, rather than by the polypus concreted within it, as is generally the case (*r*), had not prevented his design.

If this had been done, that very learned man would have shewn how much more capable he was of explaining ancient coins and monuments, than of confirming that medical paradox of the antiquity of the lues venerea, by passages from Avicenna and Galen ; and even, with divine permission, from passages of Hippocrates himself. Farewel.

(*r*) Vid. *Pastæ Epist. de Cordis polypo in dub. revoc. n. 5.*

LETTER the FIFTY-NINTH

Treats of Diseases that are brought on by Poison.

1. **T**HE tenth section that succeeds in the Sepulchretum relates, partly to occult and chronical diseases, and partly to those that are brought on by means of poison. But there is much more utility in speaking of the latter than of the former, on this occasion. For the former are put down, each by its observator, either with no signs at all, or with some only: if with no signs, you can scarcely reap any advantage from the dissection subjoin'd; but if they have any symptom adjoin'd; as, for instance, a fever, a vomiting, a difficult respiration, or any thing of that kind; they certainly might have been transferr'd, with much more advantage, into those sections wherein these symptoms are each of them treated with particular regard.

And as this is done in respect to some observations referr'd to in this section, so it ought to have been done in respect to others; as it might with very great propriety. You see, then, why in this part I do not follow the Sepulchretum, and even why I cannot follow it, as I have thrown the observations of this kind, every one in their proper places, into other letters.

2. But in the other part, which relates to poisons, I shall readily follow it: and will immediately communicate to you a few examples that have been observ'd by me, (for from Valsalva I have none) or by our Mediavia. This first is Mediavia's.

3. A woman, of sixty years of age, having just din'd, ate up some little rolls of almond-paste, which were laid in a by-place in the upper part of the house: this she did unknown to her master, who had laid them there

Scarcely had an hour pass'd but she began to be seiz'd with a kind of sensation in the stomach, as if she were troubled with flatus. And this continuing a very long time, and after that growing more and more violent, she both vomited up, and discharg'd by stool, a great quantity of matter; and by these means she seem'd to be eas'd.

But soon after, a more violent uneasiness returning, and not without fainting-fits, she at length confess'd what she had eaten; but this confession was too late. For these rolls of paste, having been prepar'd in order to kill mice, had arsenic mix'd with them:

Within twelve hours, therefore, after she had eaten them, being rather depress'd in her strength, than affected with very sharp pains, or evident convulsions,

vulsions, this miserable old woman died; and thereby suffer'd for the childish curiosity of her appetite.

The body was examin'd, and dissected, on the following day, by public authority. This was about the 7th of May, in the year 1727. The posterior surface of the body, not excepting even the calves of the legs and the heels, were universally black. The body itself was not rigid. The belly was not tumid: and this cavity and the stomach being open'd, the internal surface thereof was eroded here and there, especially at the antrum pylori: the arsenic itself being seen to adhere to the eroded parts betwixt the little pieces of membranes. Nor was the duodenum free from erosions.

In the thorax, the lungs were blackish: in the heart were two polypous concretions of the shape and length of a finger; whereas, otherwise, the blood was found to be fluid, and of a lively red colour, in all the vessels.

4. As in other disorders, so also in diseases which arise from poison, neither the symptoms, nor the effects, can be expected to be entirely the same in all persons. For in different bodies are different constitutions, both of the fluid and solid parts; especially those that relate to the stomach: and, besides, the emptiness or fulness of that viscus, and these from aliments of different kinds, may be the cause why poisons, although the same, and really of the same weight, (for they may be the same in name, but differently prepar'd) do not, nevertheless, discover themselves by the same signs and effects.

Arsenic, for instance, by which word we mean that which is white, and is frequently join'd with the adjunct of chrystalline, is itself, as those very learned men Mead (*a*) and Boerhaave (*b*) affirm, factitious; and, therefore, may be differently prepar'd by different persons; so that, although you read in the works of Mead, that it is wholly soluble in water, you may read in other authors, not only that its particles were observ'd in the stomach; as in the woman in question; but were also known to be arsenic from hence, that little pieces of it had remain'd in warm water, like white little stones: as you have it in the history of Wepfer, which is the first in observation the thirteenth, among the additamenta to this section of the Sepulchretum.

This history speaks of a little boy of two years of age, who had been emaciated by preceding fevers; and two almost adult girls, who were in very good health; the former of whom had taken but two spoon-fuls, and the two latter the remainder, of a pudding in which arsenic was mix'd, the one with an empty stomach, the other two with stomachs full of meat: the first did not vomit: the others vomited frequently, and in a large quantity afterwards, being assisted by remedies.

These differences were attended with different events. The girls escap'd. But the little boy, in whom no convulsions were observ'd, among the other symptoms, had his strength decrease more and more till he died, the stomach being internally ulcerated; and the lungs of a black colour degenerating into lividness.

In the same place you will see other examples produc'd of children, who, having vomited immediately, or not many hours, after having swallow'd ar-

(*a*) Expos. mechan. Venenar. Tent. 4.

(*b*) Element. Chem. Tom. 2. P. 2. ubi de Sulph.

fenic, and being assisted by remedies, recover'd, Among the symptoms, a tremor of the limbs is mention'd in one (*c*). But a boy who had lick'd up arsenical paint, or red arsenic (*d*), and who was nine years of age, and had not made use of medicines till after the fourth day, is said to have perish'd in convulsions.

Nor are the terrible convulsions which preceded the death of a girl (*e*), who vomited very late after taking, as they suspected, a corrosive poison, omitted. A boy, of four years of age (*f*), and his little sister, who was somewhat more than a year old, both of whom vomited pretty early, escap'd; convulsions being observ'd in the latter, but not in the former.

But in these also the poison, which was in other respects corrosive, was to all appearance unknown; as also that in a woman (*g*), in regard to whom those convulsions are not observ'd; and who, if you attend to nothing else but that she threw up blood by the mouth, might seem to have died of sublimate mercury: since not only Ardoynus (*h*) has spoken of vomiting of blood as being one of the first symptoms of this poison, but Wepfer also, in the fourteenth observation (*i*), saw both bloody vomitings and bloody stools (which even Ardoynus has not omitted) in a dog, that he has expressly said had never been convuls'd, nor had its limbs rigid after death; but had its intestines and stomach inflam'd, as that woman had in part, both internally and externally, and the blood no-where concreted, either in the heart or in any of the vessels.

And this I have hinted at, without being ignorant how much the celebrated Mead (*k*), who saw globules in arsenic like to those in quicksilver, thinks that these agree with sublimate mercury in their manner of becoming deleterious.

But let us return to those things, moreover, that are added in regard to arsenic itself, in the thirteenth observation before-mention'd. What happen'd to two dogs after eating arsenic is scarcely said (*l*), except that they died: yet in their bodies after death, how far the stomachs of both of them were inflam'd; and the coats of that viscus extenuated in one of them, the intestines eroded and perforated, and that in the cavity thereof was black and grumous blood; is not omitted.

Finally, it is also said (*m*), that mountebanks and jugglers swallow down arsenic into stomachs full of fat and oily substances, without any mischief ensuing, as they soon after vomit it up privately; but that they perish, if they are oblig'd, contrary to their custom, to defer vomiting. But all these things are contain'd in the additamenta; where this also is said: that a cat (*n*) which had been made very ill by arsenic, having a vomiting brought on by a little piece of tobacco being thrust in with his food, recover'd thereby.

And in this section itself, that observation is particularly to be attended

(*c*) Hist. 2.

(*d*) Hist. 8.

(*i*) Hist. 2.

(*k*) Tentam. cit.

(*e*) Hist. 9.

(*f*) Hist. 10.

(*l*) Hist. 12.

(*g*) Hist. 11.

(*m*) Vid. etiam Schol. ad Obs. 3.

(*h*) De Venen. l. 2. c. 5.

(*n*) In eod. Schol.

to (o) which confirms what has been just now asserted. That is to say, a dish came on, in the last course, wherein arsenic had been mix'd instead of flour; and the guests, who had as yet eaten and drunk very little, were carried off immediately after taking the poison: but they who had distended the stomach with food, and with drink, were cur'd by means of vomiting; yet with this circumstance, that in their bodies after death (notwithstanding they did not die till many years afterwards) there appear'd marks of erosions that had, nevertheless, been extensive and deep. And if you read over what follows next from Parey (p), you will, perhaps, not disapprove what I conjectur'd a little before of that woman.

There are, besides, in the Sepulchretum, other observations relative to poison; although, contrary to what is generally done elsewhere, they are not referr'd to in this section.

You will find them in the seventh and eighth sections of the third book; in the former seven, or rather six; for that which is propos'd in the seventeenth observation, in the second place, is so evidently the same as that which had already been produc'd in the third observation, in regard to a professor at Padua, that it is astonishing it had not been observ'd: and in the other section, five or six; the first of which, that is the fifth, relates particularly to arsenic; about twelve little pieces of which were found to adhere so closely to the coats of the stomach, that they could scarcely be pull'd away: the same coats being extenuated, as we have said they were in the dog; and the fundus of this viscus being, besides, eroded and inflam'd; and the carcase quite livid on the back part.

But besides vomitings and stools, no other symptoms are taken notice of. And the other symptoms which we have enumerated in both the sections, relate either to other poisons, or to such as were unknown. The effects of which, when consider'd in the dead body, were generally an inflammation and erosion of the stomach and intestines; but in living bodies there were different symptoms at different times: yet none was more frequent than vomiting; instead of which, if there was at any time, or soon after succeeded, a fruitless effort to vomit, the patients then were worse, and died sooner, than those in whom the other symptoms seem'd to be equal.

And as this symptom of vomiting is also common to those, in the same manner, who have taken arsenic; if you should happen to enquire what, besides this, has been observ'd to be most frequent, you will find that it has been dejection of strength, or such circumstances as denote it; I mean, a coldness of the extremities, or of the whole body; cold sweats, paleness, and sometimes a syncope itself.

This dejection of strength; which depends upon the stomach being affected, and drawing the heart into consent, by means of the nerves; a very uneasy anxiety, as I suppose, rather than a sharp and cutting pain, precedes and accompanies. At least, in those persons whose symptoms we have describ'd, and even in children, or in dogs, we do not read that there were any clamours; but we read of an anxiety in two children, which children scarcely know how to express.

(o) § 5. in Obs. 4.

(p) Ibid. § 6.

However, in one the symptoms of tormina and singultus are remark'd; in one a tumour of the abdomen; in some a thirst; in others a swollen tongue, or apthæ in the mouth; or an impeded deglutition: or a sense of burning and heat. And in whom convulsions were manifest, or not manifest, has been pointed out above.

But some of these symptoms have now and then happen'd, and some pretty frequently, from other corrosive poisons also.

And indeed, when you shall depart from the Sepulchretum; in which alone, consider'd with a view to the effects of arsenic and sublimate mercury, those things that I just now said of clamours, and pains, and what I hinted at above, in regard to bloody excretions, seem reasonable to be said; I do not doubt but you will immediately think otherwise, and not without good reason.

5. That you therefore may read over, and compare, the more attentively, the histories which we have not in the Sepulchretum; I will immediately point out a considerable number: and all of them likewise relating to mineral poisons. From the glass of antimony (which had been heedlessly given to a coachman) among other symptoms, the celebrated Bæumlinus (*q*) observ'd bloody stools; spasmodic motions; and finally, death itself; the stomach being internally abraded, and ting'd with a red spot, near the pylorus.

Although the dog, into which Jo. Adr. Sproegelius (*r*) had forc'd the same glass, suffer'd nothing but strong convulsions, while he attempted to vomit, but, by reason of his mouth being tied up with a muzzle, could not; yet that experienc'd man (*s*) has admonish'd us, that the nature of brutes, which is "much stronger than ours, and for the most part extremely different therefrom," may overcome those poisons which our nature cannot.

And indeed, observations are extant (*t*), which show what paralyzes and convulsions, join'd with howlings, have been the consequence of the glass of antimony in another dog; and in what part of the stomach an evident inflammation arose; so that if he had not been open'd while he was yet alive, perhaps more violent symptoms might have been brought on: and they speak also of a woman, who, by reason of having taken in a quantity of this glass, fell down upon the ground, after enormous vomitings, and lay like a dead person, rigid and convuls'd; but was soon after seiz'd with a very violent pain in one foot, which was succeeded by a gangrene and sphacelus; so that, as in the case of the coachman, this medicine did not bring on the proximate cause of death in this woman, but nevertheless gave occasion and origin thereto.

Another experienc'd man, Jacobus Fælix (*u*), having given emetic tartar to a dog, and open'd him while he was yet vomiting, saw a very great inflammation at the pylorus for the space of some inches.

(*q*) *Commerc. Litter. A.* 1739. Hebd. 16. n. 1.

(*r*) *Experim. circa varia venena &c. Exper.* 41.

(*s*) *Ibid.* §. 50.

(*t*) in *Additam. ad Sect. hanc Sepulchr. Obs.* 12. *Hist.* 2. & 3.

(*u*) *Experim.* 11. inter ea quæ addidit *Dif. fert. de Mot. perist. intestin.*

It does not escape me, that there are very celebrated men (*x*), who contend that true arsenical particles have never yet been demonstrated in antimony: nor have I, for that reason, quoted these examples; and still less will I produce, from the celebrated Henckel (*y*), that of butter of antimony being given through mistake, and a constriction of the fauces and stomach immediately coming on; together with a very great heat; and after that, for months and years, such disorders of the stomach, as to make it evident, that unless milk had been immediately and largely given (and this was done also in the case of the coachman, but too late, and therefore to no purpose), which; not so much by assisting the vomiting, as by entangling and confining the very sharp and corrosive poison amidst hard curds, and cheese-like coagula, that were thrown up in great number; brought relief to the patient, he must have perish'd in a most miserable manner.

Yet there would not have been so erosive a quality in that poison, if it had not been prepar'd with sublimate mercury. But that you may compare the effects of this mercury with the effects of that butter, read the cure of Kramerus (*z*), which was happily brought about, not by milk only, but by the mixture of oil of tartar per deliquium, as it is call'd, and other things; in order to rectify and correct the mercury.

You will find that there were such erosions of the mouth, the œsophagus, and stomach, before the remedies were administer'd, as caus'd great quantities of blood to be discharg'd, both by vomiting and stool; and that very frequently; together with writhings, tormina, deliquia, convulsions, and other symptoms of that kind.

And Baccius (*a*) observ'd, from the same sublimate mercury; but to all appearance in less quantity, and certainly taken with other things; severe tormina and violent vomitings; by means of which, at length, a purulent and "burnt" ichor was discharg'd after three days, and therewith also life itself. What appearance was found upon dissection, if any dissection was made, he does not say.

Sproegelius (*b*), however, having given sublimate mercury to a cat and a rabbit, relates that the former died within the first five minutes, and the latter as soon as ever the poison was taken in; and that without any preceding symptoms, except very slight convulsions in the former, and in the latter, a vomiting: and he adds, that in the cat, the internal coat of the stomach was every where inflam'd, most in the fundus, but no where in the latter; nor indeed could it be by reason of the cole-worts which had been eaten just before; but that death had come on so speedily, because the poison being given with water, and dissolv'd therein, had immediately exercis'd its force upon the nerves.

But when he had given it to a dog in like manner (*c*), whose stomach was empty, he found the villous coat thereof, in this animal, every where fill'd with the spiculæ of the poison; and for that reason partly red, and partly

(*x*) *Commerc. Litt. A. cit. Hebd. 24. n. 1.*

(*y*) *Aët. N. C. Tom. 5. Obs. 95.*

(*z*) *Commerc. Lit. A. 1735. Hebd. 30. n. 3.*

(*a*) *De Venenis &c. ubi an venenum nutrit. &c. n. 6.*

(*b*) *Exper. cit. Exp. 26. & 29.*

(*c*) *Exp. 28.*

livid: as he also saw the whole mouth, and even the stomach, but particularly the upper orifice of it, very much inflam'd, black, and gangrenous; notwithstanding he dissected the animal when it was yet living, and after he had observ'd it to vomit with violent strainings for an hour or more; the strainings being join'd with inquietude and howlings.

In none of these three animals, except the first, has he made mention of black and coagulated blood in the heart. I see one experiment only of Jacobus Fælix (*d*) of the same kind of poison being given, though with an equal weight of arsenic at the same time: this experiment was on a dog, which he open'd immediately after having twice vomited, instantly from taking the poison into the stomach: yet he found a violent inflammation of the stomach.

And this he found in the stomach of another dog also (*e*); especially towards the pylorus, and to a very violent degree in the neighbouring intestines; but the slighter in proportion as it came nearer to the large intestines. It is true, he cut open this dog alive; but not till after he had vomited nine times: whereas he had given nothing poisonous but arsenic. And as the question is here, principally, of this poison, according to the tenor of the history I have propos'd (*f*); I will not omit the experiments made by Sprogellius (*g*), either with this poison, or others of the same kind.

He forc'd into the stomach of a cat, and a dog, a quantity of "white" "crude" arsenic. Strainings to vomit being observ'd, together with marks of anxiety, and convulsions, or concussions; both the animals were open'd before they died: and in the stomach, which, both about the pylorus, and in every other part, was inflam'd, he found coagula of blood that had been extravasated betwixt the rugæ, or among the villi, and concreted there: and in the dog, this kind of blood surrounded the arsenic.

Cobalt, which is the ore of arsenic, having been thrown up in vomiting, by one or two dogs, without any injury; he tied up the mouth of another (*h*), that the animal might not vomit: and the most violent efforts to vomit came on; together with anxiety, convulsions, weakness, and, within a very few hours, death.

In this dog the stomach was, in some places, a little livid, and every where greatly inflam'd, as the intestines were also; but proportionably less, as they were more distant from the stomach. Nor are observations wanting of the fatal effects of cobalt, when taken into the stomach, in human bodies; so that one, of the celebrated Kundmannus (*i*), contains the death of three at least, which follow'd from thence within a few hours; all of them having been seiz'd immediately with the most violent tormina, enormous vomitings, and cold sweats: the back part of the bodies after death being livid, the stomach very much inflam'd, and a bloody humour flowing from the eroded vessels of that viscus.

The same observation also speaks of the death of a woman, after tormina and vomitings of that kind; death coming on within a few hours after swal-

(*d*) addit. ad Dissert. cit. Exp. 10.

(*e*) Exp. 9.

(*f*) n. 3.

(*g*) Exper. cit. Exp. 30. & 31.

(*h*) Exp. 35.

(*i*) Aët. N. C. Tom. 5. Obs. 102.

lowing red arsenic. And as to yellow arsenic, or auripigmentum, as it is call'd; what sence of heat and erosion, and how many repeated vomitings and stools have been excited thereby; and in how great quantities; Gerbezius (*k*) will inform you: and from him you will also learn, that it almost kill'd a whole family, some of whom discharg'd blood from the mouth and from the intestines; and that it kill'd a girl entirely: so that what you will read in Heydius (*l*), of chrystals being taken out of auripigmentum, and given to a hen, whereby she was kill'd; and this by means of a flux of the intestines being brought on; is less to be wonder'd at.

And although litharge has no relation to arsenic, but to lead; yet it is worth your while to read the experiment made, by Brunnerus, upon a dog, by giving him this poison dissolv'd and boil'd in vinegar; and his account of the dissection: and the observations also of Jo. Jac. Franc. Vicarius (*m*), made upon persons who had drunk of wine, into the casks whereof, litharge, boil'd with bole, had been thrown, in order to correct its acidity, deserve your notice and attention.

Nor are others less worthy of attention; as, for instance, one of the celebrated Jo. Mat. Mullerus (*n*), and another of the celebrated Just. David Hammerus (*o*). For from the tormina, vomitings, stools, anxieties, deliquia, and thirst, which we read of in the first; and from the thirst, heat, and bloody stools, that are read of in the second; and also from the speedy death in both cases; and in like manner, from the spots of the whole body, the red marks of the whole alimentary canal, and the subtile perforation of the intestinal coats, in several places, which we read of in the first; and from the black colour of the body posteriorly, the great external inflammation of the stomach and all the intestines, and the internal erosion of those parts, that are propos'd in the second; it is very certain, that a corrosive poison had occasion'd these appearances in both cases: although what this was, by no means appears for a certainty.

But it is certain, that, in the histories I shall point out briefly, both the symptoms, and the diseas'd appearances of the viscera, were the consequences of arsenic having been taken in. Preussius (*p*) mentions a constriction of the fauces and chest; a thirst, heats, gnawings, tormina, very great vomitings, and frequent intestinal discharges. Mullerus (*q*), whom I have already commended; besides these symptoms, and pains of the belly; speaks also of the swelling of this cavity immediately, and anxieties. And Maurice Hoffmann (*r*) likewise takes notice of a speedy swelling of the belly, but a much more considerable one; a lividness of the face and eyes; and contortions of the neck.

The celebrated Heimreichius (*s*) mentions continual vomiting, for four-and-twenty hours successively, together with horrible clamours, a tremor of

(*k*) Eph. N. C. Dec. 3. A. 5. & 6. Obs. 137.

(*l*) Obs. Med. 49.

(*m*) Dec. modo cit. A. 4. Obs. 100.

(*n*) Eph. N. C. Cent. 5. Obs. 51. in Schol.

(*o*) Commenc. Litter. A. 1738. Hebd. 10.

(*p*) Eph. N. C. Cent. 3. Obs. 15.

(*q*) Obs. paulo ante cit. & Schol.

(*r*) Eph. N. C. Cent. 9. & 10. Append:

n. I. Obs. 38.

(*s*) Act. N. C. Tom. 2. Obs. 10. circa medium.

the limbs, and a palsy of the feet. The celebrated Jo. Phil. Wolffius (*t*) speaks of very severe pains of the stomach and belly; join'd with a cholera morbus. Hammerus, whom I have quoted above (*u*), and the most excellent Quelmalzius (*x*) also, mention very severe symptoms: the former violent vomitings, great weakness, and contractions of the limbs; and the latter, moreover, anxieties, cardialgias, a swelling of the eyes and the whole head, very severe, cutting, and eroding pains of the intestines, heats, and other similar effects.

But as the arsenic in these cases, in general, though not in all, was in great measure thrown up by these vomitings; and as whatever remain'd thereof, and the beginning disorders arising therefrom, were envelop'd and restrain'd by mild oily medicines, and particularly by milk; I shall point out other observations made, both before death and after, upon those who could not be sav'd.

Etmuller the son (*y*) relates of a girl, that having taken arsenic, and thrown up a great quantity of viscid fluids in the beginning of the night, she was found dead in the morning: and yet the carcase, besides a kind of livid and blueish tract externally, did not, when dissected soon after, shew any appearance in the viscera, that you could impute to the poison: there was no where any thing putrid, or foetid in the intestines; no inflammation or erosion in these viscera, or in the stomach: although the stomach, among other things, contain'd a white powder, which, when thrown upon burning coals, afforded an arsenical fume; and a powder similar thereto, which had been found in the house, being forc'd into the stomach of a little dog and a cat, kill'd the former in an hour and a half, and the latter in three hours, after having excited very great vomitings: the stomach of the cat being inflam'd in a small part, and that of the dog in a large part; as was also the neighbouring intestinum duodenum, near to which there was an enormous erosion.

But from these effects the stomach of the girl seems to have been defended, by the great quantity of viscid matter and food, which she had before taken; yet not so from the irritation of the internal coat, and of the nerves that go thereto.

And examples are produc'd of arsenic being applied even externally, and exerting its efficacy; either where there are ulcers of the skin (in regard to which affair, as it does not greatly relate to the present question, we refer you to those things that I have written in a former letter (*z*)) or where it is found; to the examples of which kind, that, in particular, may be added, on which the observation of Heimreichius, just now quoted, turns; whether you consider the celerity wherewith it was injurious, or the violence and obstinacy of the injury, when arsenic was sprinkled on the hair, instead of what is call'd Cyprus powder: not to say when it was endeavour'd to distinguish it by smelling.

(*t*) Eorund. Tom. 5. Obs. 29. in fin.

(*u*) Commenc. Litt. A. cit. Hebd. 27. n. 2.

(*x*) Commenc. ejusd. A. 1737. Hebd. 28.

n. 2.

(*y*) Eph. N. C. Cent. 3. & 4. Obs. 126.

cum Schol.

(*z*) Epist. 55. n. 12.

Yet because, in the stomach of the girl in question, neither pustules, nor tumour, nor redness, were seen; for that reason, I suppose, examples are not omitted of injuries of another kind, and these attended with the greatest danger: which, though they generally arise from taking arsenic, are also frequently brought on by the vapours thereof.

But let the case be however it will in this girl; there will be no occasion to enquire very strictly, how three or four others, whose histories I will here only touch upon, being about to add some below (*a*), were kill'd by arsenic. For that dissected by Tyson (*b*) had a foramen in the stomach, which was neither very small, nor regular. And the fundus of this viscus was, in an old woman, examin'd by Maurice Hoffman (*c*), found to be ulcerated, as it were, sphacelated, and black.

So also, in another woman describ'd by Wolffius (*d*), already quoted, it was found to be quite eroded; and not without a very violent inflammation of the pylorus, which inclin'd to a sphacelus. And in a man whom the celebrated Henckel (*e*) open'd, were spots of a considerable size, either of a yellow colour degenerating into brown, or reddish, extending themselves towards the pylorus; and, moreover, two angular foramina of the villous coat: one towards the pylorus, and the other near the œsophagus.

This man had been carried off, in a short space of time, by very violent heart-burnings, heats, great pains, faintings, and vomitings. And that woman was seiz'd with great anxieties of the præcordia, and with vehement, and, at the same time, continual vomitings and stools; and, finally, with convulsive motions; whereby her limbs were miserably distorted: so that she died within ten hours, or less, amidst the most violent tortures. And that you may not have any room to doubt from whence all these symptoms had their origin; in the stomach of both of them was found arsenic.

6. Thus far I have taken notice of the symptoms which are the consequences of taking arsenic, in particular; as I could gather them from histories that are extant, either in the Sepulchretum, or in other authors, whose observations might be added thereto: and though this reviewal has, probably, been more prolix than you would wish, yet it, perhaps, has not been altogether useless.

Now I shall tell you what I have seen myself at two different times; first in one person, and in the second place in three: all of whom I suppos'd to be affected with this poison, when I well weigh'd and consider'd all the circumstances that I could find out by enquiry afterwards.

The first was a man of a robust and large body, and of a pretty full habit, whom, having been seiz'd with a fever, I had now almost cur'd; the fever being so much remitted, that he sometimes rose from his bed. This man; within less than half an hour after his supper, wherein he had taken nothing but some bits of bread boil'd in broth; was seiz'd with a very troublesome vomiting: and the more so because it very frequently return'd.

At an unseasonable hour of the night, one of his domestics came to me,

(*a*) N. 9. & 21.

(*b*) Aët. Lips. Supplem. Tom. 3. S. 4.

(*c*) In cit. Append. Obs. 35.

(*d*) Cit. Obs. 29.

(*e*) Aët. N. C. Tom. 2. Obs. 155.

telling me the case, and begging to know what was necessary to be done. Supposing the uneasiness to be increas'd from thence, that the patient was oblig'd to vomit with an empty stomach, I order'd broth to be given him; and if the vomiting, nevertheless, continu'd to be troublesome, desir'd that a glyster should be given to take it off.

All this being of no effect, he return'd; and I order'd other things; among which was, at length, one grain of purified opium; saying, that if this had no effect, I myself would come. The opium also being thrown up in a quarter of an hour, I arose, and went to the patient together with the servant.

As I was going along; being surpriz'd that so violent a vomiting should come on suddenly, and continue so long without a manifest cause; I ask'd the servant whether the patient had been guilty of any irregularity, and whether he had taken more or less of any thing at his supper than had been already said. The servant saying that nothing had been taken besides that bread boil'd in broth; "Nay, says he, and that powder which you order'd was sprinkled upon it by N."

I, however, who had order'd no powder to be sprinkled upon it, and was not ignorant what might be the intention of this person who had sprinkled the powder, thought to myself, without taking any notice to the servant, what I must immediately do; how far I must conceal what I had learn'd; and what I was to beware of hereafter, and in what manner.

And now I had come to the patient, who complain'd, miserably, not so much of a vomiting, as of an inexplicable kind of writhing pain at the scrobiculus cordis, as it is call'd; and implor'd assistance as soon as possible. There was no tension in that part, or in the remaining region of the stomach; nor any pain. But a singultus troubled him very frequently; being attended with eructations, and often with a kind of difficulty of breathing. His pulse was very frequent; but rather weak and small.

Be of good courage, said I; you see how much deprav'd and vitiated humour you have thrown up (and a great quantity, indeed, there was; the viscid phlegm, wherewith he abounded, swimming at top; and at the bottom was the bread which he had taken: nor had he thrown this up at first, but some hours after); you must now be recruited with a very mild and good fluid: and I immediately gave him a large glass of cow's milk, which I got as soon as possible.

No sooner had he drunk it, but he cried out that I had given him new life. And, indeed, all his symptoms became better: so that his pulse return'd, within two hours, to its natural magnitude and strength; the pain grew more mild; and the vomiting return'd no more; not even on provoking it by means of art.

But by giving the milk in repeated doses, and in greater quantity than before; so that it might be thrown up by the mouth, if the stomach was so inclin'd; or that it might sheath over, and wash the intestines; I obtain'd this second point, by loosening the belly: the pulse being, at the same time, become less frequent; and the difficulty of breathing, and singultus, (both of which symptoms were now observ'd less frequently) being remov'd to such a degree, as to be observ'd but once or twice on the following days;
puddings,

puddings, also, prepar'd from barley, or rice, together with milk, were given.

And as much whey as he chose was given him to drink ; for as the intestinal discharges came on, the thirst and heat grew greater, both which were reliev'd by drinking a quantity of whey. Whey also, or milk, injected by way of glyster, sooth'd the sense of heat wherewith the rectum and anus began to be troubled.

Not to make the history too long ; within two or three days, all the symptoms that had been the consequences of this poisonous powder, were driven away : nor did the man, as long as he liv'd ; and he liv'd many years afterwards ; find any remaining marks of injury in the stomach or intestines.

Thus the viscid humours wherewith this man, as I have said, abounded ; and the speedy and frequently-repeated vomitings ; and, finally, the milk and serum, by the quantity of which, whatever of poison, or its effects, remain'd in the stomach or intestines, was entangled, diluted, wash'd off, and carried out by the intestines ; sav'd him from the threaten'd and imminent destruction.

I might now openly declare by what means I took care that this powder, which I afterwards understood to be white, should not be again given to the patient ; for it is long since that the persons have been dead ; and at the same time shew in how much danger a physician may frequently be, unless he dissembles his knowledge of some things : and in how much danger the patient may be, whether he hears certain things from the physician or not ; and yet in what manner I prevented new snares being laid for the patient's life : and, at the same time, escap'd the revenge of a wicked man, who would have been greatly irritated, if he had perceiv'd that his designs were obviated by my endeavours.

But it is better to pass over to those things which I have seen in three other persons, in whom the same conjecture, but not the same dissimulation, was necessary.

7. In the month of May of the following year, which was 1711, that excellent priest Francesco Balducci was returning home from a sacred peregrination, when he stopp'd a little while at Cesena, just that he, and the three others with him ; who were, as well as himself, in the prime of life, and in very good health ; might dine frugally and without delay.

These persons were his own brother's wife, another woman, and a man. Soon after dinner they went out from the inn, and continu'd their journey. But they had not gone far before the priest was seiz'd with so great a pain in his belly, that he was under a necessity of being taken from his horse.

When he was taken off, he discharg'd a great quantity of matter, both by vomiting and by stool ; and yet this pain, join'd with an inexplicable *angor*, or writhing pain and anxiety, increas'd to such a degree, that he seem'd to be giving up the ghost. Being carried back to Cesena, he was suppos'd by the physician, to be affected only with a colic pain ; because the seat of the disorder was in the right epicolic region. Through the whole of that day, therefore, and a great part of the night, he applied as many glysters, fomentations, potions, and bolusses, both of an anodyne and purging nature, as

any other physician would have prescrib'd within many days; but all were to no purpose.

And although this physician saw one of the women, in the mean while, seiz'd with vomitings and purgings; and, moreover, with swoonings; and heard the man complaining of a heat and weight in his stomach; still he did not suspect any thing of poison; I suppose, because the other woman, who had din'd at the table with them, had not found the least bad symptom; and the master of the inn, also, very firmly asserted that there could be nothing hurtful in that dinner; and because the man, who had of his own accord taken theriaca, found the heat of his stomach greatly increas'd therefrom.

He himself prescrib'd an anodyne emulsion for the woman who was disorder'd. But both this woman and the priest were reliev'd by the disease itself; by the force whereof a great quantity of matter continu'd to be discharg'd from the stomach and intestines. And these discharges being diminish'd about the morning, they all went together in a carriage to Forli, immediately sent for me, and related every thing that had happen'd.

Upon hearing the relation, I instantly enquir'd whether there was any dish in the dinner whereof the woman, who had not been affected, had eaten nothing: and when I heard that there was, (to wit, a pudding made of rice, which was brought first of all in a large dish) I said that there must, then, be poison in that pudding. And so we should believe, said they, if they who ate the most of it had been the most affected; and they who ate only little, the least: but the case is quite otherwise; for this priest, who ate the least of that dish, as he did of all the others, has been, and is, the most violently affected: the woman, who ate something more than he, has been less violently affected: and the man, who ate a great quantity, was, and is, disorder'd in the least degree of any.

But was not, said I, some scrap'd cheese sprinkled over this pudding, as there generally is? When they answer'd that there was; and that the priest, having no appetite, had taken scarcely any thing except that cheese; but that the woman had eaten much more of the rice than of the cheese; and, finally, that the man had scarcely taken any cheese, but a great quantity of rice; You yourselves, said I, perceive plainly, without any hint of mine, that there was a corrosive poison in the cheese; perhaps, mix'd therewith in order to destroy mice; and that this cheese, not having been laid aside, (as it ought to have been with the utmost caution) somebody, who was ignorant of such a mixture, had sprinkled it upon the pudding, at the time when the servants of the inn were in a hurry to prepare your dinner.

I seem'd at that time to have conjectur'd justly; and still more, when, a long time after, the innkeeper; having heard that these persons had escap'd the danger; being less fearful on his own account, made no scruple to whisper something privately. Nevertheless, after clearing up the case thus far, two occasions of doubt seem'd still to remain: one, that in eating they had perceiv'd a certain odour of not a very agreeable nature; I suppose, from the bad cheese; but no unusual taste, and no sense of erosion afterwards, either upon the tongue or upon the fauces: the other, that although

I sup-

I suppos'd the poison to have been corrosive, it was not certain which of the corrosive poisons it was, so that any peculiar antidote might be oppos'd thereto.

But in the preceding case (*f*), also, there might have been the same occasions of doubt. For neither in that case, as you may safely argue from my silence, was there any mark of erosion upon the tongue, or in the fauces; nor did I know what poison, in particular, had been given: and yet my conjecture of corrosive poison was confirm'd by the great advantage wherewith milk and whey had been given; and it was at the same time shewn thereby, that where the species of poison is unknown, and you cannot apply its proper remedy; you must, at least, make use of that which is opposite to the genus thereof, which is less unknown.

I should have done the same thing in this case as in the former, if a greater number of discharges by vomiting and stool, which had preceded, but were now entirely remov'd, and the vanishing of the *angor* and tormina, had not already seem'd to prove the poison to have been evacuated. Yet, in order to obviate the effects of any that might happen as yet to remain; and, at the same time, that the thirst and the fever, which had follow'd so great a quantity of evacuations, and so violent a commotion of nature, might be allay'd; I prescrib'd a large quantity of whey to be drunk by the priest and the woman.

For as to the man; who was neither thirsty nor feverish, nor ask'd any thing else of me than that I would remove the sense of weight whereby his stomach was oppress'd; I assented to his petition, by giving him oil of almonds, with this intention, that I might rather excite vomitings than stools; and that with a remedy of such a nature, as, if any eroding particles still remain'd in the stomach or intestines, might be of use by entangling, and, at the same time, sheathing them.

However, as vomitings could not be excited, even by thrusting the fingers into the fauces as far as possible; the intestines were made lax, and the sense of weight was entirely remov'd. And as he was very well after this, I recommended to him nothing but puddings made of rice and milk.

These I gave to the others also by way of supper; when I had already observ'd the fever and the thirst to have grown very slight, by large draughts of whey. They had a very good night; so that the woman, on the following day, was quite free from fever, or any other symptom; and the priest, whose fever and thirst decreas'd gradually more and more, had nothing now remaining to complain of besides these: for the sense of heat which he had felt the day before in discharging his urine, was now quite remov'd.

And though through the whole of that day, and the following night, and a great part of the next day, every thing continu'd to grow better; and the intestinal discharges were free and easy, and unattended by any sense of heat; I did not, however, omit to give the same things that I had given for two days before.

8. But, behold! on the beginning of the fourth day from the time that

the priest had been seiz'd with that very violent pain, at the same hour in the afternoon, and without any previous manifest cause, he was seiz'd again with it in the same manner. His feet were cold in the beginning; his pulse was somewhat contracted. Besides the pain, there was a certain inexplicable anguish in the whole belly; whereby the patient complain'd that there was a great interception to his breath, and that by this chiefly he was oblig'd to writhe himself here and there, in a miserable manner, sometimes to rise and sometimes to walk.

But the pain occupied the right epicolic region, and the neighbouring part of the loins, sometimes extending itself from thence transversely, through the hypogastrium; at one time into the right side of the scrotum, and at others into the neighbouring thigh: so that it might seem to be nephritic.

But the man had not ever been subject to this nephritic pain: and that the pain, extremely similar to the present, if you except the vomitings and the stools, wherewith he had been attack'd four days before, had not been nephritic, not only that proximate preceding cause which I have spoken of above, but the violent effects thereof upon his companions, at the same time, evidently shew'd: and, finally, the urine being nothing chang'd, but perfectly similar to that of a healthy person, contrary to what is usual in nephritic patients, join'd to prove that the pain was not of that kind.

However, as none of those things which I had order'd to be applied externally were of any service; and the patient asserted, that he could not bear the application of glysters, for this reason, that a tumour of the hæmorrhoids, and a very great pain, had come on at the same time, together with a tenesmus; so that, if this pain should be exacerbated by the introduction of a pipe, he could not be capable of supporting himself under it; the urgent necessity of relaxing, and the similitude of the nephritic pain, impell'd me to try a remedy which is useful in this pain; I mean, a warm and emollient bath.

Nor did my expectation deceive me. For scarcely had the patient sat down in the bath, when first the *angor*, and a little afterwards the pain, remitted. But upon his coming out of the bath, and being again attack'd therewith; I was oblig'd to procure him a little sleep, and by that means to refresh him. By taking one grain of purified opium, therefore, he slept an hour.

Being awak'd, and finding himself somewhat less troubled with his pain, so that he could now take some food; I gave him a ptisan of fat broth: after taking which he slept the remaining part of the night.

On the day following, the patient being feverish, but having no pain in his belly, I gave him oil of almonds, and, at a certain hour, a clyster of milk and mucilages: and lest this glyster should be obstructed by the pain of the piles, though this was now become less, a very small tent was previously introduc'd into the rectum, smear'd over with the fat of frogs; as this fat, according to the observation of a physician who was my friend, was proper to assuage the pains of those veins; and when the tent was taken out, the glyster-pipe, in order to make it less troublesome, was cover'd over with the inverted gut of a young chicken, and by this means slowly and gradually introduc'd.

The glyster being injected, and he having retain'd it for an hour or more, he got some relief from a kind of *angor*, which was even then still remaining in the belly; and from his thirst. Against which, and the bitterness of the mouth, a great quantity of the water of Nocera, being drunk, was profitable.

After this time every thing grew better and better continually. And the woman obtain'd relief, also, from almost the same medicines, when yellow, but at the same time useful stools were now and then troublesome; by bringing with them a thirst, and certain slight and wandering pains of the belly, together with a tenesmus, which was attended by a sense of heat.

Nor was the priest free from yellow stools, but less fluid than in the other case; and attended with no inconvenience, but that of bringing on the pain of the piles. In these stools were quantities of mucus, which, being once compacted into a globular figure, and attentively examin'd by me, seem'd to resemble a kind of indigested fat, wherewith a sort of tendinous substance was mix'd.

This globular body was discharg'd on the fourth day after the relapse, together with solid excrements tinctur'd with blood; this blood not being mix'd with its substance, but only sprinkled upon the surface: so that you might perceive it to be from the piles.

Thus these two, also, recovering within eleven days from that almost fatal dinner, liv'd many years after, without any mark of injury being left in the stomach, or in the intestines. And, indeed, the priest was carried off by no other disorder than an aneurism of the aorta, within the thorax; which, beginning six years after, he bore for a long time, even to the utmost extremity that was possible.

9. Now, to begin from what was said last, and remark something, by way of addition to the other circumstances that were observ'd in the four patients in question; if you happen to find Paawius giving his opinion, in this tenth section of the *Sepulchretum* (g), that the signs of poison having been given, were a very great dilatation of the right ventricle of the heart, and of the neighbouring vena cava; and the blood concreted in the heart, and all the veins, as he imagin'd, in the living body, and by the force of the most cold poison; as if it had not been at seven hours after death that he dissected the body; do not suppose that the aneurism of this priest is to be consider'd as a confirmation of his opinion.

For dilatations of that kind are not so soon brought about as he seems to imagine; and, certainly, in our patient, the signs of an incipient aneurism did not shew themselves till many years after, as I have already said; so that, if you suspect it to have had its first origin from the constrictions which happen'd at the time of the pain and *angor*; yet you cannot contend, that this is to be consider'd as a symptom of poison, which others may suppose to have been brought on by so many other causes, and at so long an interval of time.

But as to what relates to the blood being coagulated both in the veins and the heart itself; I have frequently related this appearance to you, as having

been seen in bodies that had been kill'd by causes far different from poison : so that, if it happen'd from the blood being concreted within, as it is conjectur'd in the subjected scholium, that the heart of Germanicus (*b*) could not be burnt ; a great number of hearts of other persons, also, in whom there could be no suspicion of poison, would be incapable of being consum'd by fire.

And what if you add to that which is here said, the opinion of the very ingenious Mead (*i*) ? that poisons act chiefly upon the nerves, and not upon the blood ; which opinion also seems to be consonant to that of Harderus (*k*) : and, indeed, in regard to some poisons, this cannot be denied ; as, for instance, those that kill instantly ; such as Vibulenus Agrippa (*l*) “ drew from “ his bosom in the very senate-house ” (not from his *ring*, as Baccius (*m*) asserts, who had some other persons in his mind at that time, as I suppose (*n*)) ; “ a poison, whereby he fell down and died so soon, that he “ could not be carried away into prison, even by the hasty hands of the “ lictors, before his eyes were clos'd in death, the halter being applied “ to his throat in vain ;” or such as Locusta (*o*) prepar'd by the command of Nero, “ very speedy and instantaneous ” in its effects : whereby not only a little pig “ was struck instantly dead,” but even Britannicus “ fell down at “ the first taste :” for the virus (*p*) “ so pervaded all his limbs, that his voice “ and his breath were equally and instantly taken from him.”

And to Mead himself (*q*) none seem'd more proper to confirm his opinion, than that poison which he says, from the experiments of Nichols, had kill'd a dog in its very passage through the œsophagus, “ in less than half a minute in all ;” and even when injected into the extremity of the intestine, did the same thing in a moment, without leaving any marks of inflammation or erosion behind : so that we need be less surpriz'd at those things I have remark'd above (*r*), of the rabbit from Sproegelius, or of the girl from the son of Etmuller ; as both of them explain the case in the same manner, for this reason.

Yet as, while poisons affect the nerves, it happens that the motion of the blood becomes “ various, or is intercepted ;” to use the words of Wepfer (*s*) ; or that “ the circulation is at one time impeded, and at another “ time very confus'd ;” it will happen, also, that the blood is found to be in a different state in different bodies.

Mead (*t*), therefore, supposes it to happen, that, if by an universal palsy brought on by poison, the circulation be suddenly suppress'd, the blood continues perfectly fluid in the vessels, the secretions being at other times (*u*), as in a disturb'd circulation, interrupted ; and when the small vessels are ob-

(*b*) Sueton. de duodec. Cæsarib. l. 4. c. 1.

(*i*) Tract. de Venen. passim.

(*k*) Sepulchr. S. cit. in Schol. ad Obs. 17. Additam.

(*l*) Tacit. Annal. l. 5.

(*m*) De Venenis ubi de venenor. ingest. sævitia.

(*n*) Vid. Plin. Nat. Hist. l. 33. c. 1. & Annot. Dalecamp.

(*o*) Sueton. l. 6. c. 33.

(*p*) Tacit. Annal. l. 13.

(*q*) Tract. cit. in Append. Tentam. 5.

(*r*) N. 5.

(*s*) Sepulchr. ibid. in Schol. ad Obs. 3.

(*t*) Append. cit.

(*u*) Introduct. in fin.

itruſted by ſtagnation, (all which circumſtances happen by reaſon of the nerves being affected) that the blood itſelf is variously chang'd; in conſequence of its being a humour compos'd of divers other humours mix'd together, and liable to any changes whatever, from a change of its motion alone.

But theſe changes of the blood, beſides that they are neither the firſt, nor the proper, effects of taking poiſon, may be far different in different bodies; according to the various affection of the nerves: and not only this, but according to the various diſpoſition of the blood.

Therefore, not to quit the conſideration of arſenic, the woman who died from taking that poiſon, as you have read above (x), had her blood fluid, and of a bright red colour; but the dog, which was kill'd by the ſame poiſon, as I related juſt now (y), had his blood black and grumous. And I remember that; when I diſſected nine rats, of the larger ſize, which had been kill'd by poiſon, and ſent me by a friend; I ſaw, in every-one of them, both the auricles of the heart diſtended with black blood: but not coagulated; nor, as in living bodies, very fluid.

Yet becauſe I diſſected thoſe little animals, not to ſee what were the effects of the poiſon, but in order to be better acquainted with ſome things relative to the natural ſtructure; I have nothing to obſerve here in relation to the preſent queſtion; except that the ſtomach was very full in all of them, and not, as far as appear'd externally, inflam'd in any one, and much leſs perforated: and both theſe aſſertions will hold good of the inteſtines alſo.

Nor does Heydius (z) ſay, that in two rats, after having taken the ſame poiſon, the ſtomach, which was fill'd with ſlime and bread, was inflam'd or eroded. But this he ſays, that when he diſſected one of them after death; for the other he had open'd when alive; “no blood flow'd out of the veſſels: and even that from the ventricles of the heart, upon cutting off the apex thereof, not a drop of cruor diſtill'd:” but whether this was becauſe it had been confin'd in other veſſels or reſervoirs, or becauſe it was coagulated, is uncertain; as he does not add a word upon this ſubject.

On the other hand, it is certain from the experiments of the moſt excellent Ellerus (a), that when with blood newly drawn, he had mix'd a third or fourth part of the ſolution of arſenic, the blood was immediately thicken'd; though its globules, if examin'd by the microſcope, were greatly extenuated, diſſolv'd, and driven into motion as it were: among which globules appear'd, here and there, ſmall triangular chryſtals, that reſembled the cutting points of arrows; ſo that from all theſe things he conceiv'd, that very ſtrong corroſive poiſons, of this kind, act by deſtroying, not ſo much the fluid, as the ſolid parts of our body.

But he was not ignorant likewise, that arſenic, when taken into the ſtomach, was not ſo immediately mix'd with the blood; and you, in fact, ſee that it cannot be mix'd in that proportion. It will be better, therefore, to return from drawn blood to the living body; and from dogs and rats to

(x) n. 3. (y) n. 4.
(z) Obſ. Medic. 48.

(a) Hiſt. de l' Acad. R. des Sc. de Berlin
A. 1752. Claſſ. Philoſ. Experim.

human bodies ; and I will produce the appearances which Ruyfch (*b*) found, from arsenic having been taken in.

He sometimes inspected carcases of that kind : and contrary to those who “ think, that, in such a case, the blood only is coagulated,” he never found it coagulated, but the stomach ulcerated ; if there had been time enough for it ; as in a woman, a great part of whose stomach he preserv’d in spirits : to the internal coat of which, that was in various places affected with ulcers, white arsenic “ adher’d.” But if it had happen’d that they died sooner, then he saw bloody points, lying at a distance here and there, through the stomach.

10. From these observations of Ruyfch, join’d with those that are mention’d above (*c*), it is very clearly perceiv’d, that the first and proper effect of arsenic, when taken into the body, or of other corroding poisons of this kind, is exerted on the internal coats of the alimentary canal ; especially of the stomach, wherein they first harbour : the nerves of these coats being irritated, and the coats themselves being prick’d ; and if time be given, inflam’d, ulcerated, and pierc’d through.

In misfortunes of this kind, therefore, nothing can happen more desirably, than that the stomach may soon throw up what it had taken in ; or at least as soon as possible : and from hence it has chiefly happen’d, that they who have been attended by me, in these cases (*d*), escap’d.

And it happen’d still much more happily to a certain gentleman, that ; when, instead of cream of tartar, he had taken two drachms of emetic tartar ; by some vomitings which follow’d thereon, not unattended with strictures upon the præcordia, he was immediately freed from all inconveniences of the stomach : the celebrated Dethardingius (*e*) supposing, that no sooner had some moleculæ of this medicine been dissolv’d, and stimulated the stomach to contraction, but, without giving time for the dissolution of the remaining particles, the whole of it ; which otherwise must certainly have kill’d the man by its great quantity ; was thrown up by vomiting.

But there are some who are by nature less prone to vomit. There are some also, in whom, after accidents of this kind, the fibres of the left orifice of the stomach and œsophagus are so strain’d into strong action, as to resist the fibres, which contract themselves, in the other part of the stomach : nor does it always follow, that, if any thing be then given, or forc’d down into the stomach, these resisting fibres, as Wepfer (*f*) teaches, are relax’d ; for there are cases wherein the man then swallows, and yet is troubled with a fruitless effort towards discharging the contents of his stomach at the same time (*g*).

And even those who do not vomit soon, are sometimes less in danger ; as, for instance, if they take the poison upon a full stomach. Baccius (*h*) therefore advises, that, when we cannot avoid a banquet, which we suspect, we neither come thirsty, nor hungry ; but full of milk, and fat and viscid foods,

(*b*) Thef. Anat. 8. n. 70.

(*c*) n. 3. 4. 5.

(*d*) n. 6. 7.

(*e*) Eph. N. C. Cent. 9. Obs. 74. cum

Schol.

(*f*) Scholio cit. supra ad n. 9.

(*g*) Sect. hac Sepulchr. Obs. 4. § 6.

(*h*) De Venen. ubi de Particulari Præserv. n. 1.

that we have previously taken. For he had seen (*i*), that, from the same poisonous food, which had been eaten by a whole family, the master alone died on that very day; as he had eaten upon an empty stomach; the others, who had eaten on a full stomach, being sav'd.

And though this circumstance does not always defend from poison, yet it very frequently retards the pernicious effects of it; as you have seen in the woman with whose case this letter began: and to the senators of Capua also, who were about twenty-eight in number, death happen'd very late, for this reason, that they had taken the poison when fill'd with food and wine; and, by this means, "had made the force of the poison less efficacious in bringing on a speedy death," as Livy (*k*) has transmitted down to memory in his histories.

So if a little poison be swallow'd down into an empty stomach, together with a great quantity of food, it is not surprizing, if the danger become less. For, by these means, either the poison is kept at a distance from the coats of the stomach, or is sheath'd over, and obtunded, by a great quantity of matter being mix'd with it. And in this manner may be explain'd most of the things that have been said above by us. I say most of them; for some of them are certainly more difficult: and this in particular, why the priest (*l*) was not seiz'd with pains in the region of the stomach, but in the right epiploic region.

Yet if this had happen'd only on the fourth day, it might then be conjectur'd that some particles of the poison, and particularly those retain'd in the cells of the intestine colon, had vellicated and prick'd the coats thereof. But that it should happen so soon after taking the poison; unless you suppose the stomach to have been somewhat more to the right side; as it, in fact, is in some bodies; or because this is very rare, the intestine duodenum to have been somewhat more to the right side, or something else of a similar nature, you will not easily account for and explain.

II. However, that it never came into my mind to make use of the theriaca, or other antidotes of that kind, in the cure of patients who have taken poison, I know you will not be surpriz'd. For why should I, when it was pretty clear that the poison was of an eroding nature, add fuel to the fire, and still more stir it up; or at least encrease its effects?

And indeed, I saw that when one of the four that I cur'd, had taken theriaca of his own accord (*m*), the heat of his stomach was encreas'd: for which reason I am less surpriz'd that the boy, taken notice of in the Sepulchretum (*n*), who had theriaca given him twice, should have died within four hours after taking arsenic: and if Jo. Faber (*o*) had given nothing but mithridate to the young man who had us'd the powder of *risagallum*, or opiment, instead of cinnamon, he certainly would not have sav'd him.

But he did save him, because he gave him fat broths at the same time, and a great quantity of milk.

(*i*) Ibid. ubi Venena quibus modis fieri possint irrita. n. 10.

(*k*) Historiar. l. 26.

(*l*) supra, n. 7. 8.

(*m*) n. 7.

(*n*) Sect. hac in Addit. Obs. 13. Hist. 7.

(*o*) Ibid. Hist. 12.

So I, also, suppose a boy and two girls, who were in great danger from having taken arsenic, to have been sav'd by Jo. Jod. Cysatus (*p*), not because he had given the *electuarium Orvictanum*, but because he had given milk frequently before; and because nature had previously assisted them all by speedy vomitings.

For alexipharmac remedies of this kind cannot entangle the eroding particles; nor can so envelope and cover them over, as to prevent them from inflaming and ulcerating by their asperities: nor yet can they sooth and cleanse the ulcerated parts: but, on the contrary, they must add new motion and power to these corrosive particles; and to the ulcerated parts, new heat and inflammation.

Whereas it is evident, on the other hand, that milk, oil, and other somewhat viscid substances, whey, and even water itself, by entangling some, by diluting others, of these particles; and, in fine, by soothing and cleansing the parts as much as possible; must strongly counteract the tendency thereof: especially if they be given in such a quantity as to assist the vomitings; and, if any poisonous quality remains after these, be continu'd so as to dilute and obtund its noxious energy.

And, indeed, although the ancients propos'd some things that are less suitable; Ardoynus (*q*), nevertheless, sufficiently shews how much they esteem'd those remedies we just now mention'd. But the more modern physicians; omitting the useless and the noxious applications; have approv'd of the others, when occasion has offer'd: some in their writings, and some even in the observations of others that they have collected.

Thus, in regard to milk, besides those that I have referr'd to above (*r*), many other observations are extant; among which is one, in particular, that Henry Doorschodt (*s*) says he had taken from Hoffmann: that is to say, an observation of ten young men being taken ill in a short time after eating water-gruel, wherein rather more than two ounces of arsenic had been mix'd with as many ounces of sugar; who were, nevertheless, sav'd by means of milk being given to drink, for so long a time, till all the efforts to vomit ceas'd: and it was necessary to give this remedy in so great a quantity, "that scarcely ten measures of milk were sufficient for each person."

Thus, to speak of oily remedies, (and oil of almonds, indeed, was given to these also, as well as to many others) what the moderns, as well as the ancients, thought of them, you will find propos'd by that celebrated man John Gentilis (*t*).

And in regard to aqueous remedies; among which is whey, and water itself; turn to a disputation in Etmuller, which is entitled, "The small beginnings of great diseases." Therein you will have an example (*u*) of a man who, having by mistake drunk that fluid which is call'd *aqua fortis*, was prevented from receiving any injury by drinking a large quantity of water soon after. To which add another from Sydenham (*x*); who, by means of

(*p*) Ibid. Hist. 2. & seq.

(*q*) De Venen. l. 2. c. 1, 2, 3. 5. ubi de Curat.

(*r*) N. 5.

(*s*) Differt. de Lacte in Corollar.

(*t*) Annotaz. alla pag. 64. v. 5. della Lett. Filof.

(*u*) § 47.

(*x*) Epist. Respons. l. vers. fin.

this remedy alone, given copiously by the mouth, and injected by the rectum, sav'd a man "who had taken down a very considerable quantity of corrosive sublimated mercury."

And Boerhaave (*y*); where he proposes such things as he thinks it necessary to apply where the species of the poison taken in is unknown; not only commends that cure of Sydenham's, but also recommends most of the remedies that we have mention'd above, and made use of in those patients; not even the bath and opium, finally, being omitted: and he shews how far the latter of these remedies may be useful.

The other remedies are not omitted in that part of Etmuller's works which I just now referr'd you to; and how far these have been advantageous when the poison was less known, the observation of Screti, in the Sepulchretum (*z*), demonstrates.

Yet when its species is known; how much more advantageous it may be to make use of the remedies that are peculiarly opposite thereto, you will learn from two histories that are pretty similar in most respects, except in their event; the one in the same place (*a*), the other in the works of the celebrated Mead (*b*); if you will compare them one with another.

However, I should here admonish you, if you were not capable of observing yourself, how different symptoms arose in those three persons whom I had under my care at the same time (*c*); though from one and the same poison. But of minerals enough; as you have also heard, on a former occasion (*d*), what mischiefs I have seen from sulphur, when taken into the stomach.

Now let us add a few things upon the subject of vegetable poisons.

12. A poor woman, about sixty years of age, who (whatever the cause of this intention might be) had attempted several times to throw herself into the river, having, last of all, gather'd a great quantity of the leaves of the *rhododaphne*; a shrub that, in our country, is call'd *oleandro*; and having drunk the juice express'd from them together with wine; was heard, about three hours after, by the women who were in the next cabins, to vomit very violently.

They ran to her, and perceiv'd what she had done: and, as she was thirsty, they gave her a glass of water, thinking that there would be no remaining mischief after the vomiting.

But, as they soon after perceiv'd her to be much worse, they first sent for the priests, and in the next place for our Mediavia; who happen'd not to be far off: and this was about five hours after the woman had drunk that poisonous juice.

In her respiration he observ'd nothing that deserv'd to be greatly taken notice of; nor in her face, if you except her lips of a brown colour, and particularly the lower lip; for the other parts were either of a natural co-

(*y*) Vid. Instit. § 1129. & Prælect. ad eund. §.

(*z*) Hist. 10. in cit. Obs. 13.

(*a*) Hist. 13.

(*b*) Traët. de Venen. Tentam. 4. in fin.

(*c*) N. 7, 8.

(*d*) Epist. 55. n. 9. & seqq.

lour, or were but just a little inclin'd to a pallid hue: nor was her body cold, but only a little less than warm.

As the women who were about her said that she had now no power of speech remaining; he cried out aloud in the patient's ear, who lay like a person asleep, to stretch out her hand. But she easily rais'd herself up to sit; and the women, in the mean while, having stretch'd out one arm, she soon after gave the other herself.

Her pulse was small, weak, and somewhat hard. Endeavouring to give an answer to a question that was ask'd her, she made a kind of inarticulate noise indeed, but utter'd no distinct word; pointing, at the same time, with her finger to the matter that she had vomited on the ground, which was considerable in its quantity. He prescrib'd remedies to be given her to drink immediately; but in vain. For she, taking scarcely any thing, died within four hours after he had seen her; so that she did not live more than nine hours after drinking the juice I have mention'd.

The carcase being order'd to be dissected on the following day, which was the seventeenth of November, in the year 1745, by the judge of capital matters; and Mediavia, by whom all these circumstances were related to me, presiding at the dissection; it was first of all observ'd, that there was nowhere any lividness in the fore-part of the body; nor did any tumour, not even of the belly, appear: but on the back-part it was universally of a violet colour, from the head to the bottom of the lower extremities.

The abdomen and the chest being open'd soon after, some heat was perceiv'd internally, even at that time; although it was seventeen hours after death. Within the former cavity every part was in a natural state, and a natural position; so that neither the stomach, nor any other viscus, was swollen: for as to the transverse tract of the colon being reflected downwards for the space of three or four inches, and returning up again from thence; this is an appearance which, as you may have learn'd from my letters, is met with very frequently, even in those persons wherein it seems to have happen'd thus naturally, rather than from disease.

But when they fix'd down their eyes very attentively, they observ'd that the veins which pass through the stomach, the omentum, and a part of the intestines annex'd to the mesentery, were very much distended.

On cutting into the stomach, they saw therein a green humour, in a small quantity. This being wip'd away, no mark of disorder was found any-where in the stomach: except that the rugæ, which pass'd through the fundus longitudinally, near to the antrum pylori, were harder than they naturally are.

Nor was there any thing preternatural in the duodenum, when open'd: notwithstanding it contain'd some of the same green humour that they had seen in the stomach: which, perhaps, was from bile that had been pour'd out, and mix'd with acid juices; although the gall-bladder was found to be moderately full: for that juice which the woman had drunk, would rather have retain'd its black colour from the wine that was mix'd therewith.

In the thorax, the right lobe of the lungs was connected to the pleura; being very red on the back-part, and seeming to have some coagulated blood,

as it were, within its substance. Yet the left lobe was not only every-where loose and unconnected; but so collaps'd into itself, as if scarcely any air was left within: and it was but a little red on the back-part. In the ventricles of the heart there was not the least fluid or coagulated blood. However, when the larger vessels of the heart were cut into, a great quantity of blood flow'd out, which was neither grumous and coagulated, nor yet more fluid than natural.

The head was not touch'd.

13. I have the more willingly committed this observation to writing, because I do not remember to have read, in any author, the dissection of persons kill'd by this poison; nor yet that the symptoms which ensue upon its being taken into the stomach, have been observ'd by any one of the more modern authors.

And the ancients have not all asserted it to be hurtful to the human body; nay, some of them, on the contrary, have asserted it to be useful. "The *rhododendros*," says Pliny (*e*), "does not even find a Latin name amongst us: they call it *rhododaphne*, or *nerium*. What is surprizing of this shrub is, that the leaves of it are a poison to quadrupeds; but a security to man against serpents, when drunk in wine, with the addition of rue. For sheep and goats are said to die, if they drink water wherein the leaves of this shrub have been macerated."

And you will see that Dioscorides (*f*) has written what is pretty similar to this; and that neither Apuleius (*g*), nor even Lucian (*b*), whom he then almost copied, had taken notice of it as being pernicious to any creature but beasts. It is certain, indeed, that the former has said the flowers of this shrub, which were commonly call'd "laurel roses," are "a poison:" but he says this, because "it is death to all cattle to eat them."

Nay, Lucianus had even asserted that they were not pernicious to all those animals, but only to asses and horses. For thus have they faithfully render'd him into Latin: "This food is bad for every ass and horse; for they say, that any of these creatures which have eaten of it, die immediately." On the contrary; to pass over Scribonius (*i*), who says, with some considerable plainness, that he who should be willing to chew the leaves of the rhododaphne as a remedy against the tooth-ach, must not swallow his spittle; Galen, at least (*k*), has expressly taught us, that this shrub is not only pernicious to cattle, but to men also.

And all the principal of the Arabian physicians, whom you will find particularly quoted by Ardoynus (*l*), have propos'd remedies against this poison. And as to the symptoms which follow upon its being taken into the stomach; that are collected both by the same author (*m*) and by Matthiolus (*n*); they come pretty nearly to these: a violent streightness arises, the belly swells, is painful, and becomes lax; an inflammation is created; and a heat of the

(*e*) Nat. Hist. l. 24. c. 11.

(*f*) De Med. Mat. l. 4. c. 77.

(*g*) Metamorph. l. 4. prope initium.

(*b*) In Lucio, five Asino.

(*i*) Compos. Med. 55. cum Rhodii not.

(*k*) De Simpl. Med. facult. l. 8.

(*l*) De Venen. l. 3. c. 21.

(*m*) Ibid.

(*n*) Comment. in c. 12. l. 6. Dioscorid.

whole body, a loss of sense, a syncope, and death, follow after: and these because the rhododaphne is immoderately heating; and, in like manner, incises, bites, ulcerates, and resolves.

But as you will readily acknowledge, that scarcely any of these symptoms and effects were observ'd in the patient we have describ'd, when living; or in her body after death; so you see plainly that there were other and far different appearances: for which reason, I doubt not, but you will wish with me, that whenever any one was hurt by this poison, whether in ancient times, or since, we could have the histories of what had happen'd to them written; rather than the diagnoses of many authors, who frequently copy from one another; and which sometimes correspond more to their own hypotheses than to observations.

And as experiments have been made upon dogs from so many other vegetable poisons, by Wepfer, and by others; and as the symptoms they suffer'd while living, and the appearances found in their viscera after death, have been observ'd by these authors; so I could wish, that either the same thing had been done in regard to this, or that I had time to do it at present: I would do nothing more willingly than compare all the observations of this kind one with another; that we might see what difference we could distinguish in one from the other, in regard to the species, the temperature, the age, the country, the part of the plant, or the state of it; or, finally, in regard to the fluid that was mix'd therewith.

14. Now, if we consider this one observation; we shall think it probable that this poison had acted upon the stomach and its nerves, and, consequently, upon others that cohere therewith. For what were the very hard rugæ of the stomach; what those vomitings; what that bile, as it seem'd to be, press'd out; what the lost power of speech; what that kind of sleep, as it were; what were other circumstances that I now pass over; but symptoms that lead us naturally to conjecture some internal convulsions and contractions, whereby the blood also might be stopp'd in its course, and distend those external veins of the stomach and intestines?

Nor would I have you say, that, if all these things happen by the stomach being vellicated internally, the internal surface of the stomach itself ought to have appear'd to be more inflam'd with distended vessels. For it is sufficient that the stomach is so vellicated as to irritate its nerves, in order to explain those things that I have spoken of; but that it should be inflam'd, is by no means necessary.

For, to take notice, first, of an observation made on the human body; in regard to the *coriaria*, or that plant which was call'd *rhus myrtifolia monspeliaca*, C. B. how speedy, how repeated, how horrible, and, in a short time, how fatal an epilepsy it excites, is shewn by that very celebrated man Des Sauvages (o).

Yet the same author could not find, by examining the body of this man after death, (who was kill'd by eating only fifteen of the berries of that plant, at most) any injury of the brain, or of any other part; and particularly of

(o) Mem. de l'Acad. R. des Sc. A. 1739.

the stomach itself; wherein there were, even then, five berries of the coriaria; the others having been thrown up by means of an emetic, that had been given.

And to pass on to many observations, and those upon several brute animals of different kinds; certainly a great number of violent symptoms were undergone by a dog, and in like manner by a cat; the former of which was kill'd by Heydius (*p*), by giving two of the nuts call'd vomicae; and the latter by Sproegelius (*q*), by forcing down a drachm of napellus.

Yet in the dog "the stomach, the œsophagus, and the intestines, were quite in a natural state:" and the stomach of the cat was "very similar to one in its most natural state; and nothing like erosion was seen: the viscous coat being very bright and smooth, and the intestines, together with the other viscera, in a very healthy state."

Therefore, as Heydius had thought it to be pretty plain, from his observation, that the fluid, by which the brain and nerves are moisten'd, was chiefly "infected by this poison;" so Sproegelius (*r*) has concluded as follows from his: "Since I have seen no sign," says he, "either of erosion, or inflammation, in the animal killed by this poison, it must chiefly have exerted its influence upon the nerves; by vellicating the nervous membrane of the stomach."

And indeed, turn to the experiments of Wepfer, Brunnerus, and Nichols, made upon those animals, to whom they had given some vegetable poisons; and to some of them the same that Sproegelius and Heydius had given; you will read that there were violent symptoms in all of them; which came on soon after taking the poison: yet you will not find that the stomach was inflam'd in all of them.

For in one of them (*s*), "the internal surface of the stomach was white: nor did the least sign of inflammation appear in any part." In another (*t*), "the rugæ of the stomach were white; and if, in some places, they were a little more red than is observ'd at other times, they nevertheless were not manifestly inflam'd." In a third (*u*), "no signs of inflammation could be observ'd in the stomach, notwithstanding the surface of the rugæ was less white than it is found at other times to be." And, finally, in a fourth (*x*), the stomach and intestinum duodenum "were quite white on their internal surface, and free from all inflammation."

And in none of those that Nichols dissected (*y*), "was any inflammation of the membranes to be seen internally;" but the veins were distended with fluid blood, such as they were distended with in the cat of Sproegelius: and this I take notice of, because there was not any coagulum of blood in the four animals just now taken notice of from the Sepulchretum; and indeed, in one of them (*z*), as well as in the woman in question (*a*), "not the least quantity of blood remain'd in the ventricles of the heart."

(*p*) Obs. Medic. 50.

(*q*) Experim. circa venena Exp. 2.

(*r*) §. 5.

(*s*) in Additam. ad Sect. hanc Sepulchr. n. 9. cit. Obs. 5. Hist. 1.

(*t*) Ibid. Obs. 6. Hist. 1.

(*u*) Ibid. Obs. 7. Hist. 1.

(*x*) Obs. ead. Hist. 5.

(*y*) apud Mead. in Append. supra ad

(*z*) Obs. 5. cit. Hist. 3.

(*a*) n. 12.

However, the same appearances were not found in all these, as in those four to whom the same poison had been given: and even in many of them was an inflammation of the stomach; so that it ought to seem less surprizing to you, if I should, by producing two recent histories, show, that the same had existed in the nearest intestines at least, or in these and the stomach at the same time, from some one or other of the vegetable poisons.

The pernicious effects of the berries of the solanum, which they call *furiosum*, have been several times observ'd; but never more than in a little boy, who died in a miserable manner, in a few hours: his body being dissected by that celebrated man Schreckius (*b*), had, among other appearances, the intestines jejunum, and colon, very much inflam'd.

And mushrooms, particularly mushrooms of that species which Vaillant has describ'd thus, "the mushroom of the middle size, universally white," did almost the same thing near Paris, as they had formerly done at Rome, while Pliny was writing his history (*c*); I mean, "kill'd a family;" but that nature, assisted by the art of that experienc'd physician Monnier (*d*), who describes all the symptoms accurately, and in order, out of the six, that had eaten them, sav'd five.

The same author, in examining the body of a virgin; who was the only one that could not be sav'd of all these; among many other appearances, which you will see in his own relation, found some marks of inflammation in the stomach, about the pylorus: and the intestine duodenum had the vessels of its coats quite fill'd with blood internally; being, at the same time, besides some slight excoriations, distinguish'd with purple spots, and inflam'd at the upper part thereof.

And I have seen an inflammation of the stomach, and intestines, brought on by a vegetable medicine: but one of the most acrid kind; and one which, for that reason, sometimes brings on death as certainly as poison: I mean the black hellebore. The history of the case is as follows.

15. A man; who, if you judg'd from his countenance, did not seem to be fifty as yet; of a well-form'd body, somewhat fat, and of a good colour, though a little inclin'd to brown (having black hair and black beard) being in the hospital under cure, on account of a melancholic delirium, was about to depart from the hospital immediately, when he took the extract, as it is call'd, of black hellebore. By this medicine he was purg'd to a considerable degree.

But when no mischief was expected; in the beginning of the night, that is, at the seventh or eighth hour from the time he had taken it, he was attack'd with vomitings, and pains of the belly. Yet these seem'd to be quieted soon after by drinking some warm broth; that is, about the second hour of the night.

At the fifth hour they again came on; and seem'd again to be diminish'd; so that he went to bed before the sixth hour: and he had thrown up nothing by vomiting, but as much of a green kind of matter, degenerating into black, as two or three spoons could have contain'd. When he lay down

(*b*) *Commerc. Litter. A.* 1743. Hebd. 8.
n. 4.

(*c*) *Nat. Hist.* l. 22. c. 13.

(*d*) *Mem. de l' Acad. R. des Sc. A.* 1749.

he seem'd to be quiet and easy; at least he made no noise that show'd him to be in pain: nor any which the patients, who lay in the nearest beds, heard.

At the eighth hour, however, a certain sound, which came from his mouth, was heard by the attendants: at which they running to him, found him already dead.

These things being accidentally related to me; for I was at that time (it being about the middle of December, in the year 1747) teaching anatomy in the hospital; I first enquir'd what kind of extract of hellebore, and how much he had taken. And I found that it was the same which had been generally given to others there; I mean, an extract made from the fresh-drawn roots, bruis'd and prepar'd with simple water: he had taken the quantity of half a drachm; whereas, very frequently, the weight of a scruple was given, and sometimes, to those who are not easily purg'd, more than half a drachm, without any injury.

As I enquir'd, after this, whether the man had taken any thing else that could be hurtful; I was answer'd, that so far was this from being the case, that he had even done wrong by not taking every thing he ought to have taken. For the patient, to whom this extract was given, ought to drink whey after taking it: but he had not drunk his whey; as was certainly known after his death, by the whey being found in the very same place where it had been put for him to drink.

Having learn'd these particular circumstances, relative to the case, I undertook the dissection of the body, at eight-and-thirty hours after death.

The limbs of the carcase not being observ'd to be rigid, or contracted, the belly was open'd. We saw the stomach and intestines to be inflam'd, here and there, even on the external part: so that as the intestine ileum was, in some places, of a natural width, and in other places of a greater or lesser width than natural; where it was narrower than natural, there the coats were very thin, and without any redness: but in other places they were seen to be distinguish'd with red striæ.

Then the stomach, and all the intestines, being wash'd out with water pass'd through them, and open'd; we found the stomach, together with a small part of the annex'd gula, to be, in part, inflam'd; but on the left side only, and not on the right: and the intestines were here and there inflam'd; yet in such a manner, that the inflammation was less slight in the thin than in the thick intestines: if you except the rectum, wherein some spaces were equally and evidently inflam'd, as in the stomach. Yet no violent inflammation appear'd any where through the whole of this body.

The spleen was a little larger than natural: and on its flat surface, that is to say, where it was in contact with the stomach, of a rosy colour; and universally so lax, that the interior parts of it, when cut into, were almost fluid. In the liver was nothing worthy of remark, unless the colour of the bile; which, as was seen through the coats of the gall-bladder, appear'd to be of a green colour, degenerating into paleness.

The thorax being open'd, the lungs were found to be every where unconnected and sound: nor had the heart, or the great vessels, any thing

worthy of remark, except that in the latter there was little blood, and in the former a slight polypous concretion.

When the cranium was cut into, a little bloody serum flow'd down: and soon after we observ'd, that there was but a little blood in the sinusses of the dura mater, and the larger branches that are spread through the pia mater.

The brain, which I was at first surpriz'd at in one who had labour'd under a melancholic delirium, was so lax, that when it was taken out, and laid upon the anatomical table, the very weight of the hemispheres collapsing outwards, made a distraction upon the posterior part of the corpus callosum: and yet it was not then the sixth day after death.

This distraction did not prevent us from distinguishing, upon the remaining upper surface of the same corpus callosum, which was found, that fasciculus which is protuberant in the middle longitudinally; and which, in this body, did not differ from its usual appearance.

In cutting through the cerebrum soon after, I saw, that neither in the small vessels which pass through the medullary substance, nor yet in the plexus choroides, was blood wanting: but I every where observ'd the same laxity as I did also in the cerebellum, and the medulla oblongata; and in the glandula pinealis itself; which appear'd rather bigger and more globular than usual.

But in so great a laxity of the other parts, it was surprizing that the lacunar, or roof, which joins the right and left paries of the third ventricle together, was not at all overstretch'd.

16. From the latter part of this history, you would have something to add, by way of exception, to those things that I have already said (e) upon the brain of persons who had been melancholically delirious; if the man had not seem'd to be recover'd before death. And from the remaining part you have what sometimes happens from black hellebore; and what is found in the stomach and intestines in this case.

It is asserted by some, and particularly by Gulielmus Fabricius (f), not only that he had read of a prince being kill'd by a medicine prepar'd from black hellebore; but also that he remember'd a matron, of a pretty strong habit of body, to have died, within six hours, after having taken some pills for her head, wherein a little of the same extract of hellebore had been mix'd; notwithstanding they had brought on a discharge from the stomach and intestines no more than twice: both of which deaths he, with justice, suppos'd were not to be ascrib'd to the hellebore itself, or to its extract; which he had made use of very successfully both on himself and others, but to the negligence of those who prepar'd the extract, or the hellebore; or to their unskilfulness.

Yet what symptoms had preceded these deaths, or what injuries were found in the internal parts of their bodies after death, I do not now remember to have read, either in him or in others.

For as to Ardoynus (g) enumerating the symptoms that arise from this hellebore, and supposing them to be a very great flux of the belly, a parch'd state

(e) Epist. 8. n. 14.

(f) Respons. ad Doring.

(g) De Venenis l. 3. c. 13.

of the tongue, a very great eructation, and inflammation; besides other symptoms that are common to some other poisons, and among these, to white hellebore; in the number of which are strangulation, syncope, loss of strength, cold sweat, and spasm from inanition; if we are to form a judgment from the observation in question, most of these symptoms probably agree better with the white hellebore, than the black. At least they did not appear in the man I have describ'd.

But some of them have been observ'd, together with a violent vomiting, (which he, with great justice, ascribes to the white hellebore) in those who have died from taking this medicine; as in a woman, who, as Johannes de Muralto (*b*) relates, had very frequent vomitings therefrom; after which she was agitated with horrible convulsions, wherein she died: and as in a young whelp, which Wepfer speaks of (*i*) as having died in the same manner; although the dog of which Courtenius (*k*) speaks, that had taken down four times the quantity of the same hellebore, did indeed suffer vomitings, intestinal discharges, singultus, suffocations, and even to all appearance, pains; and yet escap'd nevertheless.

But be this as it will, you have heard what happen'd in this man from black hellebore; as you likewise have heard what appearances were found in his viscera after death. For you might have learn'd from the well-known dissections of the whelp, and the woman spoken of above, that from white hellebore the stomach has been found to be red, and even internally corroded, and of a black colour.

But what mischief had been done to the stomach and intestines of the human body, by black hellebore, you perhaps could not have known for certain; except from the present description. And if the mischief really happen'd, as it seems to have done, from this circumstance, that the man, after taking the extract, did not drink a large quantity of whey, as others always did, and as is order'd, even by Hippocrates (*l*), after black hellebore; hence then, likewise, those things we have said above (*m*), in regard to the advantage of drinking whey, in persons who have taken an acrid poison, are confirm'd.

And neither the quantity, nor the state, of the blood, shew the man to have been dispos'd to inflammation; as it was in small quantity, and fluid in consistence. Yet I would not deny that the effects of poison are encreas'd by the disposition of the body; as I readily acknowledge, that a poison may be sometimes generated by the very disposition of the body itself.

17. And indeed the ancient physicians also (*n*) acknowledg'd, “ that the same disorders are produc'd from taking down into the stomach a deadly poison, and from a corruption which has its origin from the body :” that is to say, this corruption may be so violent “ as to equal both the quality and the strength of the poison.”

(*b*) Sepulchr. l. 3. S. 8. Obs. 6.

(*i*) l. 4. S. hac 10. in Additam. Obs. 8.

(*k*) Saggio delle Transaz. trad. dal Derham T. 3. c. 9. §. 6.

(*l*) De Intern. Affect. n. 46. apud Marinell.

(*m*) n. 11.

(*n*) Vid. Gall. l. 6. de loc. aff. c. 5.

Nor were the greater part of the succeeding physicians averse to this opinion. Which I believe no observation can more evidently confirm than this, which was formerly communicated to me by Giovanni Francesco Ciccognini, who was, while living, an eminent and experienc'd surgeon at Forli; and who having learnt the experiment at Florence, made it after the manner of Redi.

18. A little son of Francesco Ridolfi, a painter at Forli, being emaciated and extenuated by a tertian fever, was at last carried off by dreadful convulsions; wherewith he was attack'd.

Upon opening the abdomen, the intestines appear'd to be drawn up to the mesentery, which was contracted; their coats being somewhat rigid, and in a manner dried up. And these viscera, as well as the stomach, contain'd a great quantity of æruginous bile; by the contact of which the scalpel was ting'd of a violet colour.

This scalpel, tinctur'd, and even dropping, as it was, with the same bile; he impress'd slightly upon the flesh of one, and another, pidgeon; in such a manner, however, as to leave the bile remaining within the wound: in consequence of which, they both died, in tremblings and convulsions, soon after. And indeed, a piece of bread mix'd with this bile, being taken down by a cock; this animal also died in a similar manner.

19. Although that formerly very excellent physician, and Paduan professor, Jo. Dominic Sala (*o*), asserted that internal poisons “are rarely generated in bodies, in other respects of a good habit, and that had not committed any errors in their method of living; and very rarely so suddenly that the patient does not foresee it from other parts, or from other accidents;” yet in this very circumstance, of not denying that this might happen rarely, or very rarely, he differ'd from those physicians that were spoken of above (*p*); who did not doubt (*q*) but, on the appearance of symptoms of poison in the human body, “those who had taken in poison might easily be distinguish'd from those who were affected from some other cause:” that is to say, from a poison generated within the body.

For they said, that those who, by their own nature, abounded with good juices, and “were like healthy persons, had taken poison.”

It is certainly of some importance, in forming such a judgment, whether the man in question was in health, or not. For in Severinus Falckius; to use examples taken from the Sepulchretum (*r*); neither the vomiting of every thing taken in, nor the stomach being internally red, and almost excoriated, could raise a suspicion of poison having been given; especially in the last stage of life: as the scurvy and irregular fevers, and after that, lost appetite, and very severe pains of the stomach, had long been troublesome.

On the other hand, in a young man for whom the opinion of Sala was ask'd; besides other symptoms of poison having been taken, this circumstance, that he was of a good habit of body, and enjoy'd good health, had

(*o*) Vid. Sepulchr. l. 3. S. 7. in Schol. ad Obs. 1. & 2.
(*p*) n. 17.

(*q*) Galen. c. 5. ibid. cit.
(*r*) Obs. 1. & 2. modo cit.

so much influence upon Sala's opinion, that he never soften'd his suspicion of poison, till, in another relation of the case, it was said that he was a valetudinarian; and of a bad habit of body.

Yet, as he was a prudent man, he would not pronounce, in his first opinion, that poison had been given; nor in his second, that it had not, for a certainty.

And indeed, although the body abounds with good juices; that very abundance is a reason why a man "ought to have a suspicion of his own happiness;" that is to say, lest "every thing be again carried backwards; by a kind of ruin:" which are the words of Celsus (*s*), who follows the monitum of Hippocrates (*t*). And we know that wicked men, who attempt to poison others, frequently seek for the occasion of weak health; that there may be no suspicion of their wickedness: and this is shown by one of our observations above (*u*): and I have elsewhere observ'd that it has been done before in ancient times.

Thus, that most crafty woman, Agrippina (*x*), who was more worthy of her son than of her parents, having determin'd to take off her husband by poison, and he being seiz'd with ill health, did not think that she ought to omit this occasion which was offer'd her: and the same woman made use, moreover, of other fallacies; not unusual among persons who attempt to kill by poison; in order to hide her wickedness.

For with this view, I suppose, it was that she pour'd the poison "into the delightful food of mushrooms;" her husband "being very fond of such a dish" (*y*); so that he might seem, by eating much of them, to have hurt himself from the too great quantity; and also from some pernicious mushroom, which was thrown among the good ones, as if by the error of the cook: whether, as it happen'd, "he was troubled with pains;" or "a violent vomiting," or "a purging;" or even "a fever" should trouble him most; for that the latter of these "continu'd with him many years, even to his dying day," is hinted by L. Annæus Seneca (*z*).

If you take notice of these, and other such cases, with me; you will be able, more easily, to distinguish the crafts of wicked men, who frequently impose upon physicians in the cases of some patients: or, at least, you will be led to suspect them; and I wish it may be before it is too late: and you will, at the same time, perceive, not only by reason, but by observations also, that some certain symptoms, as thirst, and some certain disorders, as fever, which are said by many to attend when a poison is inbred, may also attend when poison has been administer'd; and even may have preceded.

Therefore Sala, whom I have already commended, although he denied that poison "is generated without a fever;" yet did not, for that reason, in his second answer, ascribe so much to this symptom, as to affirm that the young man had died from poison generated within. Nor, indeed, are we

(*s*) De Medic. l. 2. c. 2.

(*t*) Sect. 1. Aph. 3.

(*u*) n. 6.

(*x*) Vid. Tacit. Annal. l. 12.

(*y*) Vid. Sueton. de duodec. Cæsarib. l. 5.

c. 44.

(*z*) Apocolocynt.

under a necessity of affirming the same, because no unusual odour or taste, nor any pain, is perceiv'd in the mouth, or fauces; in swallowing, or after swallowing.

For to pass over the promise of that wicked king Perseus (*a*), of poison, which could not be detected by any sign whatever, "either in being given, or after being given;" and to omit here other things, also, that might be said; you perceive sufficiently, from the observations I have related to you above (*b*), that poison has been taken in without any mark of it having been perceiv'd.

And, on the other hand, you see, that, from any animal's being disorder'd by eating what has been thrown up by vomiting in these suspected cases, it is not to be inferr'd that this vomiting was from poison that had been taken in; and not from an in-bred poison; as the last-propos'd observation (*c*) clearly demonstrates.

20. But that even the appearances found in the stomach after death may sometimes impose upon us, we are taught by that circumstance which I just now took notice of (*d*) in regard to Falckius. And to this you will add what has been transferr'd into the Sepulchretum from Ballonius (*e*), and from Riolanus, in like manner (*f*), when, in a body where poison was suspected to have been given, the stomach was found to be beset with exanthemata; and the physicians were just upon the point of absolutely determining and asserting, that these exanthemata were owing to poison; if they had not been inform'd that they were owing to the measles; which had begun to break out on the skin, but were repell'd by reason of weakness in the patient, and occupied the stomach: and the same suspicion, in many who died suddenly, has arisen from hence, that the fundus of the stomach, and particularly the left part of it, was black, both internally and externally; whereas this was not to be attributed to poison, but to the blood stagnating there, within the small veins which belong to that branch formerly call'd *vas breve*.

But, on the contrary, all spots observ'd in the stomach are not to be despis'd. And we ought to expand the stomach betwixt our eyes and the light, after opening it. For, by this means, that stomach, which seem'd only to be sprinkled here and there with some spots, was found, as Ballonius (*g*) relates, to be perforated with very small foramina, which are marks of poison: although even then I should think we ought to determine by other marks whether the poison was external or internal.

And, indeed, sometimes, not only a manifest, but a large ulcer may be found in the stomach; the first symptoms of the origin of which may seem to have been the consequences of poison that was taken in; and yet the matter may not be clear from doubt.

Thus in a young man spoken of by Fabricius Hildanus (*h*), a pain of the stomach had begun first after a plentiful meal: and this pain increasing gradually from that time, and becoming more severe, so as to kill the patient,

(*a*) Vid. Liv. Hist. l. 42.

(*b*) N. 7.

(*c*) N. 18.

(*d*) N. 19.

(*e*) Sect. hac 10. Obs. 4. § 10.

(*f*) L. 3. S. 7. in Schol. ad Obs. 10.

(*g*) Sect. ead. Obs. 17. § 1.

(*h*) Ibid. Obs. 5. cum Schol.

a large ulcer was found in his stomach after death ; extending itself from the upper orifice of the stomach, downwards, into the stomach : which ulcer the parents accounted for from poison having been given : but Fabricius thought it more probable, that the ulcer had begun from some little sharp bone being infix'd in one of the rugæ of that orifice : for if the ulceration had been made by poison that was taken in ; this, says he, “ would have existed rather in the fundus itself, than in the orifice of the stomach.”

Yet those who should chuse to dissent from Fabricius, might take objections from the cases of those two girls who were suspected to have died by poison, and in one of whom Joannes de Muralto (*i*) found five black marks, as if they had been burnt in, near to the same orifice ; and in the other of which Peter Paaw (*k*) found that very orifice eroded in two places : and, to say nothing of a man open'd by the same Paawius (*l*) on account of the same suspicion, (for, besides the substance of that orifice being eroded, he had also the remaining part of the stomach's internal surface eroded also) they might, however, produce the instance of a dog spoken of in the histories publish'd by Wepfer (*m*) ; which having taken arsenic, and died the next day, shew'd, when dissected, “ the surface that lay near to the œsophagus, in the stomach, “ to be red and inflam'd ; but shew'd no mark of inflammation about the “ pylorus, or in the fundus of the stomach.”

Finally, that it may better appear how difficult it is to judge in this matter, it may sometimes seem, in cases of this kind, that the poison itself has been found in the stomach ; as in a matron spoken of by Bened. Silvaticus (*n*), “ that fine powder, of a cineritious colour, adhering to the ulcerated part “ of the stomach, was taken for the most clear and certain mark of poison” having been given : or, as in the girl of Muraltus just now taken notice of, that other kind of “ sandy ” powder, which subsided from the fluids found in the stomach, and receiv'd in a clean vessel.

But unless the powder be found in such a quantity as to be capable of being well examin'd by skilful persons, and known to be poison ; or, unless the particles of it, adhering to the eroded coats of the stomach, are of such a kind as easily to discover themselves ; as that *gilla* which Heerfius (*o*) found adhering to them ; or as the little pieces of white arsenic which Salmuthus (*p*) saw adhering to them, and just pull'd away ; or unless, as in the woman, also, of whom is the first observation of this letter (*q*), they had other circumstances whereby to determine ; it will not be possible to pronounce any thing certain therefrom.

21. And as often as I consider with myself all these things, and others that Etmuller ; I mean the son ; has consider'd in a very learned and judicious manner, in a programma publish'd at Leipzig in the year 1729, shewing how difficult and dangerous it is to determine any thing certain in questions of this kind ; I say, as often as ever I consider these things, so often do I think that I acted very justly and properly, when, in some dissections, which I

(*i*) L. eod. 3. Sepulchr. S. 8. Obs. 7.

(*k*) L. 4. Sepulchr. S. hac 10. Obs. 4. § 7.

(*l*) Ibid. § 8.

(*m*) Ibid. in Additam. Obs. 13. Hist. 12.

(*n*) Ead. S. 10. Obs. 5.

(*o*) Sepulch. l. 3. S. 8. Obs. 8.

(*p*) Ibid. Obs. 5.

(*q*) N. 3.

might have given you here, but have written to you formerly (*r*), I would not pronounce whether the poison was generated within, or taken in from without.

Yet in that woman, in whom I found not only the stomach and the intestine duodenum, but also the œsophagus, eroded (*s*); I should have been able to take upon me to say more, if it had been certainly known that there had been no vomitings, whereby the poison, which was perhaps in-bred, being thrown up, had, by stagnating in some part of it, happen'd to injure the œsophagus.

It will not, therefore, be a slight proof of poison having been taken, that there are erosions of the stomach, if they are join'd with no vomiting, and nevertheless with an erosion of the œsophagus; especially if they be found in a person who, being in good health, and having committed no error in his method of living, was suddenly seiz'd, after taking something into the stomach; particularly any thing of an unusual taste or smell; with pains of the stomach, or anxieties, and other symptoms of poison being taken in, and died within a very short time: not a slight conjecture will be drawn from all these, I say, or the greatest part of them, being join'd into one.

But the case will be certain where the poison itself shall be found in the stomach, or in the neighbouring intestines, in such a quantity as to be easily known. See also the marks of Hoffman (*t*), on occasion of some histories that well deserve to be transferr'd into the Sepulchretum: for they propose both the symptoms and the dissections in a proper manner, by no means omitting the reasons, from whence, among the marks of poison having been given, and particularly of arsenic, that are common to many, we may understand that poison was not given to one, and was given to others.

But, in regard to that principal testimony of poison having been given; I mean, a portion of it found in the viscera; as, according to the different state of the poisons, their very small quantity, and their mixture with other things, it does not often occur; we must, therefore, take our evidences from other circumstances; some of which, as they belong to the judges of capital affairs, are omitted by me: but one which concerns physicians must not be omitted; though of itself obvious, and observ'd once or twice by me in the course of my enquiries.

For, besides that which I saw in the year 1711, and took notice of above (*u*); I mean, when three who ate of the same dish were all affected with symptoms of poison soon after; it had already happen'd before, in the year 1709, that many of my fellow-citizens, whom I knew to be familiar with each other, and to be accusom'd to feast together sometimes, call'd me to them within a few days; and, suspecting that there was some one common cause of their falling sick at one time, I found, by enquiry, that since the time they had all din'd together last, they had begun, at first, not to be very well, and soon after to be ill.

I ask'd whether there were any others at this dinner besides themselves.

(*r*) Epist. 29. n. 18. & seqq.
(*s*) Ibid. n. 20.

(*t*) Medic. Rat. Tom. 4. P. 3. S. 2. c. 8.
in Enarrat. Morb. Obs. 2, 3, 4.
(*u*) N. 7. & seq.

And having heard that there were, and that all of them, not one excepted, now were ill of the same disease; and yet that none of them had eaten immoderately, or any-thing that was not quite wholesome; and observing that few persons were diseas'd in the city that autumn; I thought it was scarcely to be doubted, but something of a deprav'd nature and similar to poison, had been mix'd up either in the foods or the liquors which had been made use of at that dinner: though, probably, owing to some accident.

But easy as it was to conjecture this in general, so difficult was it, either from the symptoms of the patients, or from an accurate and often-repeated enquiry, to learn what ingredient this was.

For the symptoms were different in different persons, according to the various age, disposition, and temperature, in different bodies; although in many of them, among other symptoms, were an intestinal flux, and tormina; and one of them discharg'd pure blood from the intestines, without tormina. But that I might have the best opportunity of enquiring into the truth, I undertook the more willingly to attend, without any reward, to the cure of the servant-maid who had dress'd the dinner, and eaten the remains of it; besides the person who gave the dinner: for both of them were greatly affected; and the servant-maid very greatly indeed.

And though I frequently said to the maid, how much more easy the cure would be, if she would just tell me alone what she had done by mistake, or what she could conjecture had been done by any-one else; I could never get any-thing out of her but this only, that the more she thought of it, the more ignorant she was in respect thereto.

This, then, being the state of the case, I was necessarily oblig'd to treat every person accordingly as they were troubled with this or that symptom, in a greater or a lesser degree. Some of them were sav'd by a short and easy method of treatment; but the others by a long and difficult course: so that in some the cure was continu'd for the space of two months; and in him who discharg'd blood from the intestines, for the space of four months.

One out of them all, who had made light of the disease for a very long time, was carried off on the nineteenth day from the time of taking to his bed, by a fever, which was attended with a singultus, convulsive tremors, and other malignant symptoms: notwithstanding his senior physician and myself gave him all the assistance in our power.

22. The only way that was now left of investigating the unknown cause of so many diseases; I mean, anatomy; it was not possible, for many and various reasons, to have recourse to. And some of the same reasons, also, prevented the dissection of another person, who it was conjectur'd, on pretty good grounds, had been taken off by means of opium being given in too great a quantity, by a mistake of the apothecary. Yet this dissection would now have been the more agreeable to me, because I see that the appearances observ'd in brute animals, which were open'd after a very large dose of opium being given them, by the very experienc'd Sproegelius (*x*), do not very well agree with those things that the celebrated Mead (*y*) had observ'd in a dog.

(*x*) Exper. circa varia venena, &c. Exp. 15. & seqq. - (*y*) Tract. de Venenis Tent. 5.

However, I would not have you expect a word from me, in these letters, in regard to the detestable abuse of opium in the hands of wicked men. For such things as these, though they ought not to be unknown to physicians for many reasons, yet ought never to be committed to public writings, but agitated in private conferences; lest that which is necessary to be known, in order to find out the proper method of cure, should be so abus'd by wicked men, as to give occasion, from thence, to kill secretly and with impunity.

Wherefore, Galen (z) so far blames Orpheus firnam'd the Divine, Horus Mendefius the younger, Heliodorus the Athenian, and other authors of books upon these compositions, as not even to grant that the knowledge of them is, at least, necessary to physicians, in order to enable them to assist those who have taken them. Be this as it will, it would certainly have been more prudent for some, in other respects very great physicians, who have succeeded him, to have suppress'd many things upon poisons; and not to have made them public in letters, or even in books that are read universally.

23. But I do not remember that any dissections have been made by me, or by my friends, of persons who have died of the bite or wound given by a venomous animal; if you except those which relate to the bite of a mad dog, and have been already communicated to you by me (a). For, to use the real words of Celsus (b), “Italy and the colder regions have the advantage of being preferable in this respect also, that they produce less terrible snakes” than the hot countries.

Nor is the case much different, in general, in regard to venomous animals that are less than snakes: and it is certain, in regard to those less hot parts of Italy in which I have been conversant, that those persons did not say true things, who related the following to Boerhaave (c): “That in Italy, where there is a great number of scorpions, no person comes into an inn, but the host immediately points out to him a bottle full of the oil of scorpions; that he may instantly anoint the wound therewith, if he has had a wound inflicted by that animal, in order, by this means, to escape the danger of death.”

Yet I would not have any foreigners suppose them to be so rare in the regions of Italy, as Pliny seems to have asserted (d). “The Psylli,” says he; that is, a people of Afric, whose bodies were suppos'd to be natural antidotes against the poison of serpents, and other venomous animals; “who, by bringing in the poisons of other regions, have fill'd Italy with foreign evils for the sake of their own lucre, have endeavour'd, also, to import these scorpions: but they could not live within the region of the Sicilian atmosphere. Yet they are sometimes seen in Italy, though harmless.”

If those things which follow upon the subject of common scorpions would suffer me; I should much more readily interpret Pliny so as to suppose him not speaking of these, but of the wing'd scorpions of Africa, whereof he had spoken last: and this on account of what he had said just before.

But as these things do not suffer me to interpret him thus, I suspect that

(z) De Antidot. l. 2. c. 7.

(a) Epist. 8.

(b) De Medic. l. 5. c. 27. n. 10.

(c) Prælect. ad Instit. § 1132.

(d) Nat. Hist. l. 11. c. 25.

something is wanting : at least, those who wrote at Rome before Pliny, Lucilius and Cicero, would not have spoken of a rare animal by way of example in this manner : the former of these authors says (*e*), “ like a scorpion bereft of his tail ;” and the latter (*f*), “ We see that snakes creep, that ducks swim, that blackbirds fly, that oxen make use of their horns, and “ scorpions their stings :” but Cicero would rather have said, *vespas aculeis uti*, or “ that wasps make use of their stings,” as unskilful persons had formerly publish’d it ; either because they did not know what to make of the word *nepa*, which is an African word for a scorpion ; or, at least, because they were ignorant that Nonius (*g*) had the two last words of Cicero in the very manner I have produc’d them : and, indeed, that he could not have produc’d them otherwise, according to the order of writing, and agreeably to the sentiment.

But if any one believe, however, that Pliny asserts the scorpions in Italy to be “ harmless ;” this is so for the most part : nor do I remember that in the cities where I have resided, even the most crowded cities, a physician, or a surgeon, was ever call’d to cure a wound inflicted by a scorpion ; and still less that any one ever died of such a wound, so that the effects of the poison could be enquir’d into in the body after death.

And, indeed, you will see that the same thing is confirm’d by our Fallopius and Vallisneri. For the latter has written (*h*), that “ a kind of innocent poison ” comes forth from the sting of our scorpion ; and Fallopius (*i*) has said, that “ in our region, where scorpions are less venomous,” a tumour does not arise in the part which is wounded by them, as in the hot regions ; but “ only pustules, and small tubercles, similar to the small-pox.”

And that we may prove the same thing by the authority of physicians who have liv’d in Italy, either in times, or in places, or in both, more distant from us than those two ; do you imagine that Scribonius, if he had seen noxious scorpions in Italy, would have written in this manner (*k*) : “ In Africa, or “ wheresoever the scorpions are noxious :” and that Cornelius Celsus (*l*) would have plac’d the poison of the scorpions “ among the foreign poisons, and those that were somewhat more pestiferous ” than our own ?

And that he did so place it, not because the scorpion was foreign, but because the pernicious scorpion was foreign, seems to me to be sufficiently prov’d by those words of his which follow after having recounted many remedies (*) : “ Yet I know physicians who have done nothing else against the bite of a “ scorpion, but let blood from the arm.”

But Redi was distant from me in place, not in time ; and Gentilis is now distant in place : both being Tuscan physicians. The first of whom (*m*) affirm’d the same as Pliny, for this reason, that he had a hundred times seen the sellers of scorpions thrust their naked hands into the sacks that

(*e*) Ex Satyr. l. 30. n. 23.

(*f*) De Finib. l. 5.

(*g*) De Propr. Serm. in *Nepa*.

(*h*) Opere Fis. Med. Tom. 2. P. 1.

(*i*) Tract. de Tumor. c. 3.

(*k*) Compos. Medic. 164.

(*l*) C. 27. cit.

(*) Ibid n. 5.

(*m*) Esper. int. agl. Inf.

were full of them ; and often have blows from them : and yet never saw the least sign of poison follow thereupon ; although it was the very height of the dog-days when these things happen'd. And the other (*n*), that fatal disorders scarcely ever arise from the bites of scorpions, except in Africa. For that some persons indeed have died by being bitten with the Italian scorpions ; but that very few examples of this kind are related by the writers of natural history.

24. That learned man produces two examples ; one from Ferrarius, and the other from Lanzoneus. In both of them a vomiting, and even in one of them a volvulus, was fatal within a few hours. And I think it will not be improper to add other examples, as many as occur while I am writing, which perhaps would have ended fatally, if they had not been timely prevented by remedies. And I shall produce them the more readily, because most of them happen'd at Padua.

Our Cortusus being call'd to a fellow-citizen of his, who had been wounded by a large scorpion, “ and was already seiz'd with a deliquium animi, re-call'd him to life, in a very short time,” by the external assistance of a powder, which he had receiv'd from Matthiolus (*o*). Benivenius (*p*) cur'd, in a little time, a servant-man, who had been instantly thrown into a very cold and profuse sweat, by a similar blow ; by giving him theriaca in generous wine.

Peter a Castro, a famous physician at Verona, had his fore-finger wounded by a scorpion ; in consequence of which wound, pain and coldness soon seiz'd upon the whole arm ; when he, having found but little effect from other remedies, was cur'd by that which his friend Rhodius (*q*) has transmitted down to us in his writings : adding this also, that the pain, nevertheless, return'd in the following year, at the same time, together with a *tumor phlegmonodes* of the finger.

But he says, that he had seen some “ bites of scorpions to be of importance, by reason of their tumour, and their pain,” at Padua. And indeed Vallisneri himself, who, as I have said above (*r*), had acknowledg'd that the poison of these animals is in a manner harmless among us, finally changes his opinion in some measure ; in an alphabetic specimen of medical and natural history (*s*), which he left imperfect ; and affirms that this poison is indeed “ harmless in the winter, but that in summer it is deadly, even in our regions.”

Of this he has, however, produc'd only one example ; which is an instance of a young woman, who, being stung in the neck by a scorpion, in the time of the dog-days, “ had her limbs gradually become cold :” nor was any other remedy of advantage, out of the many made use of, but the oil of the great duke of Tuscany, which is call'd *controveleni*, applied internally and externally.

(*n*) Annotaz. alla pag. 66. v. 23. della Lett. Filos.

(*o*) Vid. hujus Comment. in Dioscor. l. 6. c. 29.

(*p*) De abditis Morbor. caus. c. 56.

(*q*) Cent. 3. Obs. Med. 90.

(*r*) n. 23.

(*s*) Opere Tom. 3. P. 4. alla voce Scorpione.

But I would first have you take notice, that these were not fatal examples in the end: and in the second place, what are so few examples to innumerable others, which are quite different therefrom? What is this last to so many others that I have pointed out (*t*) of Redi's, at the same very hot time of year?

For, although I grant that this poison becomes more acrid at such a time of year, and that the bodies of men are more liable to be injur'd by it; yet in the month of October happen'd the case of Peter a Castro, and about the end of June that which is describ'd by Lanzonus (*u*), in the words of a physician who had been present.

And though this, and the other also, of Ferrarius, were fatal by means of vomitings; yet in the latter, the scorpion had crept into the mouth of the boy while asleep, and had wounded it: and in the former, the extremity of the intestinum rectum, of a woman who labour'd under a chlorosis, had been struck by this animal, while she was sitting down, and discharging the fœces from her intestines.

And how much it tends to increase and accelerate the noxiousness of the poison, if not only the wounded body be very tender, weak, and diseas'd; but the part itself also is more soft, and endow'd with a more exquisite sense; you can, of yourself, very easily conceive: and indeed, unless we do admit this supposition, it is somewhat more difficult to have any idea, why the wounds of scorpions are not equally pernicious to all persons: and not only amongst us, but among other nations; if you except Africa, and places that lie in an equally hot climate.

25. For when I attend to the experiments which have been made at Montpellier, I am easily induc'd to believe, that the wounds of scorpions are, for the most part, harmless there also; as they are among us. Nor do I only speak of the experiments which were made there, by Courtenius (*x*), in the year 1679.

For as to the whelp being prick'd by many scorpions in the tongue, and being struck by them, more than once, upon the abdominal muscles, after the common integuments were taken off; the sting being press'd against the part more strongly, even by art, and the poison being press'd out of the subjected vesicle into the wounds; and yet the dog's receiving no injury therefrom; nor yet a pigeon, which was frequently wounded, in the same manner, by a scorpion: and, on the other hand, that a mole, whose side had been prick'd by a scorpion, immediately died convuls'd: you may assign this reason for the difference, that the whelp and the pigeon were wounded by weak and languid scorpions; as it was in the beginning of January that these experiments were made; but that the mole was wounded by a strong and keen scorpion: as this experiment was made about the middle of July.

I, therefore, chiefly have my eye to those experiments, which were made there by the celebrated Maupertuis (*y*), fifty years after. Out of nine dogs, three little chickens, and one mouse, which the scorpions had wounded, one

(*t*) n. 23.

(*u*) Eph. N. C. Dec. 3. A. 1. Obs. 20.

(*x*) §. supra ad n. 16. cit.

(*y*) Mem. de l' Acad. R. des Sc. A. 1731.

dog only died convuls'd; and he at five hours after being wounded, and after vomitings being frequently repeated: the twelve other animals receiv'd not the least injury therefrom.

Yet in these animals the same places had been wounded, to all appearance, within a few days; and certainly by scorpions of the same kind, and in like manner strong, acrid, and fierce: so that no cause of the difference can be deduc'd from hence, why one dog, and no more, died; especially as this was wounded only by one, and some of the others by many scorpions; and even a much greater number of times; and had the sting fix'd more deeply into them: and this promiscuously, both by males and females; and in like manner such as were fresh caught; so that we are not at liberty to suppose the cause of this difference to consist, either in the variety of the sex, or in the poison, which was perhaps quite consum'd in former blows, as Redi (z) has justly conjectur'd; and not only in regard to vipers, but also in regard to the scorpions of Africa.

Yet it may be suppos'd to consist in several different circumstances; and perhaps in some one of them that are pointed out by Maupertuis. But because it happens so rarely that scorpions bring on any great injury; I should more readily believe, that it is necessary for many of them to conspire together to bring it on: or, perhaps, that some other ought to be added, as the most considerable. I will illustrate my meaning by an example.

26. Among the ancients was a little flying animal, "whose Roman name "is *afilus*;" to use the words of Virgil (a): "the Greeks, by translation, "call it *æstron*." That the same has been call'd by the Latins "*tabanus*," also, is shown by M. Varro (b); but still more clearly by Pliny (c). Whether this animalcule be the same that is call'd by us *tabanus*, horse-flie, or gad-bee, I shall certainly deny if you ask me: but whether it be what the Tuscans still call *afilus*, I shall be in doubt.

For certainly, either that is not the *afilus* of the ancients, or does not always do the same thing that the ancients have describ'd to us; I mean, that they excite the oxen, which they wound, into madness. And this is true, that the very excellent Reaumur (d) thought he ought to enquire into the reason, why this effect sometimes follows, and sometimes does not.

Therefore, as he, contrary to Vallisneri (e), acknowledges no acrid juice in this animal, which it leaves in the wound; he does not, of course, at all enquire whether it leaves more at one time, and less at another: neither does he believe that the cause of the difference is to be accounted for, from the sting being fix'd in more or less deeply; and for this reason, that it is neither more slender, nor is fix'd less deeply than the goad of herdsmen; who often pierce through the skin of oxen, but never excite them to fury by that means.

(z) cit. supra ad n. 23.

(a) Georg. l. 3. v. 147.

(b) De Re Rust. l. 2. c. 5.

(c) Nat. Hist. l. 11. c. 28.

(d) Memoir. pour serv. à l'Hist. des Insect. Tom. 4. Mem. 12.

(e) Opere Tom. 1. P. 4.

He therefore supposes that when the sting of the asilus happens to prick some pretty large subcutaneous nerve, the ox is then furious; that when no nerve of this kind is prick'd, the ox is not furious. I however, if I were even very greatly practis'd in the dissection of this animalcule, would not even then take upon me so much as to pronounce any thing against either of these gentlemen; who have not had their equals, in the very difficult investigation of the history of insects, in this age; and whose dissections deserve the most mature consideration: but I should rather endeavour, as my respect towards the memory of both requires, that if it were by any means possible, both their opinions might be compounded together; having a regard to a pretty thick nerve being prick'd, and at the same time to an acrid juice being instill'd into the wound; if I could possibly, at any time, find that such a juice did proceed from the asilus into the wound: and by that means entirely root up a certain scruple from my breast, in supposing it very difficult to happen, that the goad of the herdsmen also, should never light on some pretty thick nerve, and drive the ox into a fury.

But now transferring the conjecture, of this very great man, from the asilus to the scorpion; in regard to which we may compound both the opinions; I suspect that very considerable disorders may probably follow from the stroke of this animal, when the wound is inflicted upon any pretty thick nerve; or any other part of exquisite sensation; and at the same time a very acrid poison instill'd into the wound.

And indeed, not only the animals that I have taken notice of (*f*), as having died from hence, but those also that Redi (*g*) kill'd by means of an African scorpion, perish'd in convulsions: and that woman also, of whom we spoke above (*h*), was convuls'd; and whatever other symptoms appear'd in her, and in others of the human species likewise, who did not die, may easily be explain'd upon the hypothesis of convulsions: and it is the laudable opinion of the celebrated Mead (*i*), that other poisons also, communicated by the stroke or bite of venomous animals, are injurious, by means of the nerves in particular.

27. But in regard to a poison, also, being infus'd together with the sting, there is no longer any doubt. For although, after Pliny (*k*) had asserted "that the stings of scorpions are perforated with a slender tube, through which the poison is infus'd; and "that Apollodorus (*l*) affirm'd this "poison to be of a white colour, when effus'd by them;" Galen (*m*) arose, and asserted, "that no foramen could be seen in their sting;" and therefore, "that it was either a very small quantity which they injected, or nothing "at all:" and, indeed, though Redi (*n*) in a very large scorpion, that is, an African scorpion, could not see any foramen, notwithstanding he made use of the most exquisite glasses; yet this author has confirm'd; not only from Aretinus, an ancient writer, (who might have copied from Pliny) but from many of his own observations upon that same scorpion; that a white fluid is dis-

(*f*) supra n. 25.

(*g*) Esper. supra ad n. 23. cit.

(*h*) n. 24.

(*i*) Introd. ad Expos. Mech. Venen.

(*k*) Nat. Hist. l. 11. c. 37.

(*l*) Ibid. c. 25.

(*m*) De Loc. aff. l. 6. c. 5.

(*n*) Esper. cit.

charg'd from the sting. But others have seen the foramina; not to say the foramen; among whom was Vallisneri (o) in particular, who publish'd this discovery more than once after that, and show'd why they were not seen by Redi, who sought for them in the very extreme point of the sting: and also why they ought not to have been in the extreme point; that is to say, lest if the canal of the poison should be brought on quite to the extremity of the sting, it should not only prevent the necessary slenderness and firmness of the sting, but should become liable to be stopp'd up by any the smallest particle of matter wherewith it should meet.

And lest you should doubt, whether there are foramina in the scorpions of our country also; and these not in the extreme part of the sting; Ferdinand Anthony Ghedini, a man of a most elegant genius, not only wrote to me in the year 1707, by what means he saw them in these scorpions; but Vallisneri has publish'd the letters of Ghedini, which I had communicated to him.

There are these peculiar circumstances in Vallisneri: that the sting has three surfaces like a triangular pyramid: that in each of these is a single foramen: that through these foramina a very fluid humour is discharg'd: and that this humour is carried by a small canal, which passes through the internodes of the tail, into the extremity from whence the sting shoots forth.

You may enquire, in those foreign and larger scorpions, from whence he seems to have taken this description, whether these peculiarities are perpetual; and this moreover, what is the internal structure of the last internode.

For besides the vesicle which Coiterus (p) formerly referr'd to, by saying that, "under the sting of the tail, wherewith the scorpion strikes, a bladder full of poison lies hid;" it is very natural to suppose, that some muscular fibres are contain'd there, whereby the poison may be press'd out. For the external part of the internode cannot, of itself, do that; as it is of a horny nature: and in an African scorpion, as Redi (q) has experienc'd, it does not yield to external compression.

And under that crust, as we see in the claws of crabs, it must, of course, be that the muscles are included; whereby, as well as the other internodes, the last also may be mov'd: and so some fleshy, or tendinous expansion, reaching within the last internode, might, by a stronger contraction than that whereby it moves this internode, compress even the vesicle.

28. But this poison is far less powerful and strong in the scorpions of this country, and of other regions, not very hot; as, for instance, Montpellier; than it is in the African animals of this species. Wherefore, the violent symptoms which arise from thence, in Africa, do not occur frequently among us; and even are very rarely met with, as has been shown above (r): so that unless many causes; and among these, perhaps, the chief, that is to

(o) Vid. loca supra ad n. 23. & 24. in dicata.

(p) Obf. Anat. ex diversis brutis.

(q) Esper. cit.

(r) n. 23. & seqq.

say, the pricking of some pretty large nerve, conspire together in one person, it seems to be innocent, and without effect.

And when we suppose this, we naturally come down, with the celebrated Maupertuis (*s*), to that suspicion of many remedies which are recommended against the bites of scorpions, having seem'd to be of advantage for this reason, that they have often been made use of upon such men as have had a wound inflicted upon them indeed, but an innocent poison (if I may be allow'd thus to speak) instill'd thereinto.

Amongst these remedies, you know that, from the most ancient times, one, of the efficacy of which that celebrated man, in particular, doubts, and which is taken from the scorpion itself, has been recounted.

“The scorpion,” says Celsus (*t*), “is the best remedy for itself, either rubb'd down and laid upon the wound, or upon burning coals, that the wound may be fumigated.”

But the doubts of this gentleman, whom I have commended, seem to be confirm'd by this fumigation having been applied to that woman who was spoken of above (*u*), without effect; as she, nevertheless, died of the wound of the scorpion: and also by the circumstance of the scorpion itself having been bruise'd, and applied without effect to the wound of Peter a Castro; whose case we have also said (*x*) to be similar to those of persons bitten by the tarantula in this respect also, that in the following year the pain return'd at the same time.

For this was observ'd by Baglivi of those who were wounded by the tarantula (*y*): and this author has also asserted (*z*), “that it is clear from observation, that those who are prick'd by the scorpion, in la Puglia, suffer almost the same symptoms as if they were bitten by the tarantula.” But I have not recited those symptoms and deaths above, as I have excepted the very hot parts of Italy. He, moreover, produces the dissection of a rabbit which was kill'd by the tarantula (*a*): and does not scruple to assert (*b*), that, in persons bitten thereby, “many symptoms seem to depend upon a deprav'd imagination.”

But these, and other circumstances relative to the tarantula, I hope we shall have better explor'd and settled; if that very learned man Francesco Serao shall be able, at any time, to complete what he has begun on the subject of this insect.

Yet in the mean while, as far as relates to the scorpions of our country, I am not quite free from doubt, whether many of those persons who have seem'd to suffer violent symptoms from being wounded thereby, were not rather affected by a fear which disturb'd the imagination: and not so much from the poison, (which was, perhaps, quite innocent) as from the agitation of the mind drawing the body violently into consent.

And this doubt, in which I also see that Maupertuis (*c*) is involv'd, may

(*s*) Comment. supra ad n. 25. cit.

(*t*) De Medic. l. 5. c. 27. n. 5.

(*u*) N. 24.

(*x*) Ibid.

(*y*) Dissert. de Tarant. c. 9. & Hist. 1.

(*z*) Ibid. c. 7. & Hist. 3.

(*a*) Ibid. c. 10.

(*b*) Ibid. c. 6.

(*c*) Comment. cit.

be in part prov'd by this circumstance ; that some of them, who have scarcely receiv'd any wound, immediately complain of those symptoms which have not happen'd so soon even in those that died from the same poison : and yet the same persons, by the application of an antidote, or of some of those things which the common-people and they make great account of ; or of that which any physician, in whom they put great confidence, has recommended as a very certain remedy ; immediately cry out that they feel no more disorder, and that they are quite restor'd.

For this certainly seems to be a cure of the mind, not of the body : and if this has happen'd to procure reputation to any antidote, you see how undeservedly it must have procur'd it ; and that more certain remedies ought to be sought after.

29. But the poison of the vipers among us is not, like that of the scorpions, frequently innocent : since a great number would certainly die of their bites, or would, at least, be very greatly affected thereby, if these animals were not much more rare than the scorpions ; and, by reason of their magnitude, could not be more easily observ'd and guarded against : I say, would be very greatly affected, as I do not know of any remedy being yet found out, on which the human species can or dare depend, in order to obviate, or overcome, those very violent symptoms which succeed to the bite of a viper.

It had been very greatly recommended to eat the heads, and other parts of the vipers, for this purpose. But in the experiments of Redi (*d*) and Francini (*e*), the proposal did not at all answer.

Since this, we have heard the fat of the vipers greatly cried up, and still more of common oil, when applied to the part that was bitten.

Although it scarcely seem'd credible, that through so narrow and pretty deep foramina by which the biting viper immits its poison, sufficient access should be given to oily liniments in particular ; yet I chose rather to leave the determination to time : which, as it has demonstrated the more certain and useful efficacy of new remedies, as of the Peruvian bark, has also demonstrated that of the transfusion of the blood to be doubtful and dangerous ; and, not to go too far from the matter now in question, as it has shewn so many other remedies, formerly recommended against the venomous wounds of animals, to be of no effect, and has buried them in great oblivion : so that, for the sake of example, which Abbatius (*f*) has said “ was tried “ and tried at Padua, and found to be very useful,” I have never heard of as being barely mention'd ; much less as being made use of by any one ; for almost the fifty years that I have liv'd in this city.

Scarcely, therefore, had a few years pass'd, when those Memoirs of the Royal Academy of Sciences at Paris came forth (*g*), in which we have seen it demonstrated, by the experiments of those celebrated men Geoffroy and Hünauld, how slight and dubious are those boasted effects of the oily or unctuous applications : and that this judgment was *right*, even that very learned English physician Mead (*h*) has confirm'd.

(*d*) Lettera sopra alcune opposizioni, &c.

(*e*) Lettera del Platt fra le Opere del Redi fin.

Tom. 2. dell' Ediz. Veneta.

(*f*) De admirab. Viperæ natura. c. 31. in

(*g*) A. 1737.

(*h*) Expof. Mechan. Venenor. Tent. 1.

And although this author has added, that a more probable praise might be ascrib'd to the viper's fat; yet he has ingenuously confess'd, that this method of cure is not to be depended upon: and this you will easily allow, from the example produc'd in the Memoirs I have mention'd, of a man who was bitten by a viper.

But he recommends, in preference to other remedies, that easy and expeditious one, which I meant to speak of above, when I denied that any remedy was yet found out whereto men dare trust; I mean, that suction of the poison which is immediately made with the mouth.

For although Celsus (*i*) has so confidently recommended this against the bites of all serpents, as to assert that, by this means, the person who sucks "would be safe, and would save the person whose wound he should suck;" and though this, which was commended even by Dioscorides (*k*), was in use, not only in the times of Galen (*l*), but also in those of Aetius (*m*), Paulus (*n*), and Actuarius (*o*), by whom it is prescrib'd; to omit Rhazes (*p*), and others; and, indeed, to descend to those who liv'd nearer to our own times, though it has been recommended by Tagaultius also (*q*), Vesalius (*r*), Abbatus (*s*), Severinus (*t*), Redi (*u*), and Charafius (*x*), and by others (*y*): I say, although it depends upon so many and so great authorities, yet we must not readily expect that the people can be induc'd to give credit to Celsus (*z*), or any-one else, when he says that this poison is injurious, "not by being tasted, but only in a wound:" not even if Severinus (*a*) should cry out never so long, "Let any one suck the poison out, and depend upon me, - - I pronounce, upon my word and credit, and will be surety for the event, that whoever shall suck out this poison, will be free from every taint and danger."

30. And, indeed, I should think that the people were very wise not to depend upon this surety, that there would be no danger in such an operation (*b*); notwithstanding the person who sucks should not attend to the monitum of Celsus (*c*), which is expressly confirm'd by most of the authors I have quoted: I mean, "That he has no ulcer in his gums, palate, or any other part of the mouth."

This monitum Redi made so much account of, and with great justice, that I remember to have heard, from some one of those who were then with him, that when one of them who drank the poison press'd out from the vipers, dipp'd a crust of bread into it at the same time, and ate it, Redi immediately blam'd him; lest the crust, by wounding the gums, as it often happens to do, should bring on instantaneous danger, instead of humouring the joke.

And the same author among other causes why a mountebank, who suck'd

(*i*) De Medic. l. 5. c. 27. S. 3.

(*k*) De Medic. Mat. l. 6. c. 40.

(*l*) Meth. medend. l. 13. c. 6. ad fin.

(*m*) Tetrabibl. 4. Serm. 1. c. 10.

(*n*) De Re Med. l. 5. c. 2.

(*o*) De Meth. Med. l. 6. c. 11.

(*p*) 8. Almanf. c. 1.

(*q*) Instit. Chir. l. 2. c. 11.

(*r*) Chirurg. magn. l. 3. c. 14.

(*s*) L. cit. c. 31. & 32.

(*t*) Viperæ Pyth. P. 3. c. 5.

(*u*) Osservaz. int. alle Vipere.

(*x*) Vid. Sepulchr. S. hac 10. in Schol. ad Obs. 6.

(*y*) Vid. du Hamel Reg. So. Acad. Hist. l. 4. c. 6. in fin.

(*z*) S. 3. cit.

(*a*) C. 5. cit.

(*b*) Ibid. & alibi.

(*c*) S. 3. cit.

the wound of his arm which had been bitten by an asp, died; and even why two men who suck'd their fingers which were wounded by a viper, died nevertheless; as *Ælianus* (*d*), *Matthiolus* (*e*), and *Amatus Lusitanus* (*f*), have written; conjectur'd (*g*), that we ought to take for granted, that they happen'd to have their mouths injur'd by a kind of little ulcer.

Yet these, and other events to be taken notice of below (*b*), terrify men, while they are afraid lest that which has happen'd to any-one, whatever the cause of it might be, should happen to them in the same manner; especially those who have a scorbutic laxity of the gums, or any thing nearly of the kind: since *Matthiolus* (*i*) has observ'd, that, even without this, "blood easily flows from the gums by the force of strong suction."

They are also terrified by these other monita which most of these authors, who we have said approve suction, in concurrence with *Avicenna* (*k*), have inculcated: I mean, that the person who sucks it may not be fasting; that he must hold oil in his mouth after washing: and that he must immediately spit out what he has suck'd.

These warnings are so much the more terrifying, because the very learned *Mead* (*l*) himself commends almost the same things: although he says for this reason, "that the acrimony of the poison may not inflame the lips and the tongue" of the person that sucks it; nor without occasion: since he, upon tasting the poison of the viper, together with other persons, though mix'd with water, perceiv'd it to be "of an acrid and fiery taste, as if the tongue were perforated by any hot and burning body," this sensation lasting two or three hours: and, indeed, his companion, who would taste it undiluted, got a little ulcer thereby upon his tongue, together with some inflammation and tumour, which remain'd for the space of two days.

Men were far less terrified when they read either *Severinus* (*m*) asserting that this poison had a taste like "the unripe service-berry;" as *Branchinus*, a principal apothecary at Siena, perceiv'd, when, in the presence of *Severinus*, "he lick'd it with his tongue, and tasted it, without suffering any mischief therefrom:" or *Charasius* (*n*) affirming "that it had been tasted, and swallow'd; as he had often experienc'd; and that it had neither hurt any man nor any animal;" so that, as he at length adds, "he himself did not decline taking it into his own mouth, without any previous or consequent washing of his mouth:" or *Rhedi* (*o*), in particular, saying "he had seen in an infinite number of instances, that the lips of those who lick'd it, and swallow'd it, did not swell;" and speaking of his servant *Jacob*, who lick'd or drank it every-now-and-then with a kind of pleasure; as he certainly would not have done it on the following day, if he had receiv'd any injury in his mouth, or stomach, therefrom, or had perceiv'd an acrid and burning taste; which, on the contrary, *Redi* asserts to be "a sweet insipid" in that poison, "and very similar to the favour of oil of sweet almonds."

(*d*) De Hist. Animal. l. 9. c. 62.

(*e*) Comment. in Dioscor. l. 6. c. 40.

(*f*) Cent. 3. Curat. Med. 14.

(*g*) Observ. cit.

(*b*) N. 33.

(*i*) Ad c. 40. cit.

(*k*) Canon. l. 4. F. 6. tr. 3. c. 1.

(*l*) Tent. 1. cit.

(*m*) Cit. P. 2. c. 4. ad fin. & c. 8.

(*n*) Vid. Sepulchr. in Schol. ad Append. cit. Obs. 6.

(*o*) Observ. cit.

But in regard to so great a diffension among authors, it will be our place to speak of that presently again.

Now, then, judge whether, from this very diffension, courage can be given to the people to make use of suction: especially as they see that most authors, either among the ancients or moderns, who have recommended it, do not trust more to that alone, in general, than to the remedy which, as well as the suction of the mouth, is immediately at hand, and yet not unlike it; or, at least, is less liable to suspicions; I mean, that of cupping-glasses: for, after the use of either of these remedies, they order still other and other remedies; which is a very evident proof that suction, therefore, is not the remedy by which we may always depend upon the poison's being drawn out of the bottom of a very narrow wound; and even out of the windings and turnings of the adjacent cellular membranes, into which it may sometimes have insinuated itself.

And this you may suppose to be said of other methods of suction, either by siphons, or leaches, or by any other means whatever.

But as to the more efficacious chirurgical remedies; such as deep scarifications, burnings, or amputation; I have not spoken of them for this reason, that most persons who are bitten by a viper, either do not admit of these remedies while they promise themselves the same happy event which they hear many have receiv'd from a milder method of treatment, or, at length, cry out for the use of them too late: for that which Kramerus (*p*) asserts is very rare; I mean, that he knew a person who had his finger wounded by a viper, whereby his whole arm was inflam'd, and a fever and frequent swoonings had come on, together with deliria, spasms, and other symptoms of the like kind: and yet that this person, "at the end of two-and-thirty" hours after receiving the wound, was cur'd perfectly by the amputation of "the finger." You see, therefore, why I omitted these things, and consider'd only the milder methods; some of which I shall even take notice of below (*q*).

31. But how happen'd it, you will say, that so much reputation has been gain'd by suction, and many other of the milder kind of remedies, even in ancient times; unless men had been seen to be sav'd by them?

I, however; to omit this consideration, that it is very seldom any-one has escap'd without making use of many remedies, so that it was difficult to determine to which, in particular, he ow'd his safety; shall certainly think this worthy to be attended to, that many instances occur, among those who have frequently made the experiment, of beasts who have had their lives sav'd after the wound of a viper, without the application of any remedy either internally or externally; notwithstanding they have had violent symptoms therefrom: and, indeed, you will meet with instances where the bite had no bad effects at all; or, at least, only very slight symptoms. Thus you will read that it happen'd very frequently to Redi (*r*).

So there are other observations of the Parisians, as well those that Du

(*p*) *Commerc. Litter. A.* 1735. *Hebd.* 11.
n. 3. in fin.

(*q*) *N.* 33.

(*r*) *Osserv. cit. e Lettera cit. int. alle Opposiz.*

Hamel (*s*) quoted formerly, as those that I have commended above (*t*), relative thereto. And if you enquire into the cause of these differences; I shall say that it might have been manifold, whether you consider the vipers that bite, or the animals that are bitten, or both of them.

Those circumstances that are common to both are age, constitution of body, strength, season of the year, food, and climate; from the variety of which there may be a various degree of the injury given or receiv'd.

Thus; to speak of different regions; you see which Severinus (*u*) excepts, as those whose vipers are not noxious by their bites; although what had been related to him of the English vipers (*x*) by Houghton, does not at all agree with those things that Mead (*y*) and others assert: especially where Mead affirms that the experiments of Redi had answer'd with him in England, as they had with Du Verney before in France; or where he affirms that the same disorders "are wont to arise, every-where, almost in a "similar manner," from the bite of a viper: although, what is sufficient for our present design, he confesses that, according to the "difference of "climates," and of the other circumstances nearly that I have mention'd, "these disorders may be heighten'd or diminish'd."

And you will easily conceive that one or the other of these two circumstances may happen, according to the different magnitude of the biting viper, his rage, and the acrimony of his poison; if you suppose that, from a larger and more enrag'd viper, a greater quantity of poison is inserted into the wound, and this wound is inflicted very deeply: for as to acrimony, the question is very clear; and that this is different in different vipers, is prov'd by the difference which we have spoken of above (*z*), amongst the authors I have refer'd to, in regard to the taste of the poison, and its effects upon the lips and the tongue: for no one would be so presumptuous as to doubt whether those things, which are said to be observ'd by these authors, were really observ'd or not.

To these things we must add that which is the chief; I mean, that there is a great deal of difference betwixt the viper which has just bitten frequently and repeatedly, and that which has not done it yet after resting a considerable time.

For this was long ago recounted among the frauds of impostors, by the author of the book to Piso (*a*), *De Theriaca*, that the vipers "were made "continually to bite" meat that was laid before them in private; for by these means "they must of course throw out the poison that was contain'd "in their mouths;" from whence you, on the contrary, may deduce one cause why the hungry vipers wound more dangerously; and add it to the causes which others have suppos'd.

However, what that ancient author has asserted is confirm'd by Redi (*b*), where he says, he had many times experienc'd, that vipers throw out all their poison, if not at the first, at least at the second bite; so that the third

(*s*) Reg. Sc. Acad. Hist. l. 4. S. 1. c. 1. n. 6.

(*t*) N. 26.

(*u*) L. cit. P. 3. c. 1.

(*x*) Vid. & P. 1. c. 7. § 3.

(*y*) Tent. 1. cit.

(*z*) N. 30.

(*a*) C. 12.

(*b*) Observ. cit.

and fourth are afterwards quite free from poison : and although he hints below, that by the third also a poison may sometimes be communicated ; and even, in another place (*c*), not only proposes an experiment, from whence the third, but also another, from whence the fourth appears to have been fatal ; and the Parisians (*d*) one from whence the seventh appears to have been so ; yet if you should choose to consider these things also, which happen very rarely ; you see that it is not opposite to our purpose : for we must at length come to that bite which is not injurious, sooner or later, in proportion as the viper is larger or less ; or at least as it has less or more poison collected ; or as it more slowly repairs the loss of this humour ; or more speedily ; or pours it out more plentifully or sparingly at every bite ; or, in fine, as it generates a less or more acrid poison ; so that even the very last drop may be able to do what a larger drop is wont to effect.

32. To these circumstances add those that are peculiar to animals when bitten : such as the magnitude or smallness of their bodies ; the hardness or tenderness of their skins ; the inert or acrimonious state of their humours ; the smaller or larger quantity of blood-vessels, or nerves, that go to make up the part bitten ; and other circumstances of this kind. For the small animals, *cæteris paribus*, die sooner from the same quantity and acrimony of the poison ; as reason evidently shows, and the experiments of Redi (*e*) ; and of the Parisians (*f*) confirm.

Wherefore, it is not to be wonder'd at, if we read in the first, that ; when the same viper had bitten five ducks, and three pigeons immediately after, and neither of the three last ducks perish'd ; the first of the pigeons died : or that, although birds very easily die from the bite of the viper, the horse, bull, and other larger animals, that have an exceedingly hard skin, very frequently do not die : for they must of course receive less deep wounds.

Nor should I be much surpriz'd, if the experiments that are transferr'd into the Sepulchretum (*g*), should answer in the same manner, when often repeated : so that it would be certain these animals die the soonest, who are supplied with the most acrid humours, and have the most vivid circulation ; but those that are supplied with more watry and viscid humours, and have a slow circulation, more slowly ; and indeed, that some cannot be kill'd at all by these means.

And certainly, as in one and the same species of animals, there may be a different constitution of the humours, and even of the solid parts : in which way I think we must understand what is prudently hinted by the Parisians ; I mean, how far it is to be suppos'd, that some animals of the same species suffer more or less grievous effects from the viperine poison ; so that although this be emitted in the same quantity, and the bites seem equal, they do not die equally, or not equally soon or late : since, I say, these things are supposable ; it seems that we may gather from hence, why the animals of one species do not always die in the same order in which they were bitten by the

(*c*) Lett. cit.

(*d*) cit. supra.

(*e*) Lett. cit.

(*f*) cit. supra.

(*g*) in Addit. ad Sect. hanc 10. Schol. 2. ad Obs. 2.

viper; but sometimes, as of the five pigeons of Charafius (*b*), that first which receiv'd the fifth bite, and of the three chickens of the Parisians, that much the latest which receiv'd the second: although, as Charafius is entirely silent, whether all the pigeons were wounded in the same part of the body, or in a different part; and the Parisians had before said, that not all, but "almost all" the chickens, on whom they made the experiment, were bitten in the same part; other causes may be added, whereto we may attribute that change of order in dying.

For the bite being receiv'd in that part where there are a great number of blood-vessels, and those large; or where there are very few, and these small; or where there are many or few nerves in like manner; may be more pernicious, or more flight; so that, even by the very discharge of the blood, when it is quick and hasty, the poison may at the same time be thrown out, together with the blood; as has been observ'd by Redi (*i*): and whether this rejection might happen, in some measure, by the serum flowing out of the wound, you yourself will judge; for the Parisians deny their having seen so great a discharge in those animals which perish'd, as in those that were preserv'd.

33. You will, without doubt, here ask me, whether the poison of the viper, or its noxious quality, is carried into the internal parts of the body, by means of the veins, as most persons imagine; or by the nerves, as the celebrated Mead (*k*) supposes. You will perhaps be influenc'd to think with the first, by that experiment, besides others, which is propos'd in the Sepulchretum (*l*), as made "more than once" upon dogs; I mean, that by the poisonous juice extracted from the heads of vipers (which were wash'd with a little warm water, while they were press'd) and injected into the blood-vessels, they perish'd in a short time.

But when you observe that many other things which are by no means poisonous, when injected in the same manner, bring on death in a short time equally (*m*); you will more willingly consider the arguments which are produc'd by Mead for the way of the nerves. For he himself also, did not before disallow the way of the veins (*n*); especially where the question was of poisons being introduc'd by the wounds or bites of animals.

But he afterwards chang'd his opinion, and suppos'd, that, like poisons when taken in, those also that are infus'd by a wound, attack the nerves chiefly; as he had attended to the surprizing celerity wherewith the bite of a rattle-snake kills a dog, that is to say, "in less than a quarter of a minute."

And even when the common viper had bitten the finger of a man, and he, as is mention'd above (*o*), had immediately applied his mouth to the wound and suck'd out the blood; "he fell down dead suddenly the moment it was done:" or as the same Matthiolus, who saw it, says in another place (*p*),

(*b*) Sect. ead. Obs. 6. §. 8.

(*i*) Lett. cit.

(*k*) Tent. 1. cit.

(*l*) Schol. 2. supra-cit.

(*m*) Vid. ex. gr. inter inject. Courtenii §. cit. supra ad n. 16.

(*n*) Vid. Introd. ad Tentam.

(*o*) n. 30.

(*p*) Comment. in Præf. Diosc. ad l. 6.

“ fell suddenly down upon the ground, where being immediately depriv’d
“ of speech, he died.”

The effect was not fatal indeed, but very noxious and sudden, from the same cause, in a viper-catcher, whom Sommerus (*q*) cur’d. For he having suck’d with his own mouth, two little wounds which were inflicted upon his finger by a viper; “ his tongue immediately became tumid, as if he held an
“ apple in his mouth, together with an impediment of speech and degluti-
“ tion, an obscurity of the sight, a tumour and heaviness of the head.”

Nor would I have you immediately believe, because we have produc’d the conjecture of Redi (*r*), referring the cause of events of this kind to some little ulcer of the mouth; that the poison had enter’d into some veins which were open in the ulcer: for those who are of the opinion with Mead, might, on the other hand, say, that not only the little veins, but the small nerves also, lie open to the injuries of the poison in this ulcer.

And lest you should blame suction more than a bite; read, even in the Memoirs of the Parisians, what happen’d to that Englishman, who would have the experiment, of being bitten by a viper, made upon him. That is to say, from a bite upon his hand, a violent pain extended itself immediately through the whole remaining part of the upper limb, even before the viper had ceas’d to bite.

And you will be led to suppose, that the pain is to be imputed to the nerves, not as wounded, but as infected with poison, from that memorable circumstance taken notice of by Mead (*s*), “ that the dog had bark’d but
“ little, while a wound was inflicted” with a sharp needle, in a form similar to the tooth of a viper; but that when, by the same needle, “ the poison
“ was introduc’d, he then howl’d exceedingly.”

But besides the very speedy progression, or at least sometimes, of this poison, or of its noxious effects; which cannot be accounted for from the slow motion of the blood through the veins; add thereto the experiments of the same celebrated man upon the human blood, when receiv’d in a glass vessel; as it was not at all chang’d, “ either in colour, or consistence,” by reason of having the poison of the viper join’d with it: so that neither at that time, nor afterwards, could it be distinguish’d from a like portion of the same blood, to which nothing had been added.

Nor would I have you be stagger’d by what you will read in the Sepulchretum (*t*), that, in animals kill’d by this poison, the blood was found to be coagulated; and even in the heart, and all the veins, “ to be concreted
“ into very tenacious polypi.” From the same Sepulchretum you will meet with contrary observations (*u*), of the blood being found “ more fluid than
“ coagulated;” or “ exceedingly thin and acrid;” or dissolv’d “ in part,
“ and corrupted;” and no-where “ coagulated.”

But if, nevertheless, you observe some observations amongst these, which mention coagula and concretions; read frequently the Parisians I have commended, who, although they relate that in England two pigeons had their

(*q*) Eph. N. C. Dec. 3. A. 3. Obs. 152.

(*r*) n. 30.

(*s*) Tent. 1. cit.

(*t*) in Addit. ad hanc 10. S. Obs. 1. & Schol. 2. ad Obs. 2.

(*u*) Obs. ead. 2. & Sect. ead. Obs. 6.

blood coagulated, yet at the same time assert, that in the same, and many other species of animals, no sign of coagulation, but, on the contrary, marks of fluidity, were found in the blood: and even Redi (x), who nevertheless had found a coagulation in some, expressly denies his having found it in all.

It therefore sufficiently appears, that it is not the *immediate* and proper effect of this poison to coagulate the blood; nor yet to dissolve it: but according to the various dispositions of this fluid, and according to the various affections of the nerves in particular, whereby, as is said above (y), the motion of the blood is surprizingly disturb'd, it is vitiated in a various manner; so that, as you will perceive by reading over again the greater part of the observations referr'd to, in some it is of a very lively and bright red, in others black, and prone to corruption.

And this being the state of the question, you readily see, of yourself, that whenever medicines which are fill'd with volatile particles, that have been long since recommended against the bites of vipers, have seem'd to be of advantage, they have either lit on those cases wherein the blood was inclin'd to concretion, or have rather been useful by helping the nerves.

And this there would be the more reason for saying, if that method which succeeded so happily in the botanical pupil of that celebrated man Jussieu (z); who had three fingers bitten by a viper, not without a numbness and insensibility of them almost immediately coming on, and a considerable tumour extended quite to the very hand; from a volatile alkaline remedy being given internally, and applied externally also, to the wound, join'd with the oil of amber; if this method, I say, when recurr'd to very early, as it is said to have answer'd in a great number of brute animals, should likewise be found hereafter to answer in the human species, or at least in the greatest part of that species.

34. Yet we are not, for that reason, to deny that the vitiated blood of those who are bitten by a viper, accelerates death: and we must even grant to the Parisians (a), that it contributes much thereto; especially as when it is infected by a gangrene; which is generally wont to seize the wounded part, and the parts nearest to it, it carries the same taint into the distant and internal parts; as was seen by them in the heart and liver of a goose; and had been sometimes seen by others in the liver, which was of a blackish colour inclining to yellow; at other times in the stomach, the colour of which was "in some measure obscure," not without "a kind of appearance of lividness," or "more obscure;" and in like manner in the mesentery and intestines, wherein that colour was "more manifest;" or, either those "that were painted here and there with livid spots," and at the entrance of the biliary ducts were "infected with a lividness, or rather with a gangrenous blackness," as you will find by reading over the observations pointed out above (b) in the Sepulchretum, and the scholium.

(x) Osservaz. cit.

(y) n. 9.

(z) Hist. de l' Acad. R. des Sc. A. 1747.
Oss. Anat. 2.

(a) cit. supra n. 29. (b) n. 33.

Yet it sometimes happens, not only that these appearances are not remark'd, but even that no external lividness appears any where; as in the little dog of Francini (*c*), which had “no tumour or livid appearance in any part of the body:” and it is probable that from the small nervous branches themselves, that are there, being irritated by the envenom'd bite, contractions of the fibres are brought on, which cause the blood to stagnate in the neighbouring vessels; from whence arise the beginnings of tumour, inflammation, lividness, and gangrene: unless it should happen that there is such a disposition of the body, or of the wounded part, that, although in other places, as in that little dog, the nerves begin very soon to be convuls'd, yet the part which was bitten neither swells nor is livid; although it swells so very hastily at other times, that the Parisians have asserted (*d*) the beginning of the tumour to be observ'd in the same moment that the bite is receiv'd: yet in that noble youth whose history you see describ'd by Charasius, in the Sepulchretum (*e*), it was not observ'd till “after some hours.”

Nor does it seem that any other reason, besides the different disposition of bodies, can be assign'd why the tumour, in some persons, extends itself but little, and in others extends itself very considerably; so that in the very same noble youth, when the whole limb, which had been wounded, was occupied thereby, together with the neighbouring hypochondrium and breast, it seem'd to be now proceeding on to attack the opposite side also: and in another example propos'd by the Parisians, the tumour seiz'd on the hand opposite to that which was wounded still much sooner: and indeed our Fallopius (*f*), and Albertini (*g*), saw that the whole body was swollen from the bite of a viper; to omit Dioscorides (*b*), whose words I know are differently read by different persons (*i*).

Yet sometimes cases happen, in which, if you would wish to explain the effects of the bite of any venomous beast, it is not sufficient to speak of the peculiar disposition of body; as when a horse (*k*), whose right foot behind was said to have been bitten by a field-mouse, and which died in the space of two days, appear'd, upon dissection, to have not so much the cells of the adipose membrane, from the foot quite to the neck, fill'd with a yellow serum, and black here and there, as if from contusion, and the muscles flaccid; and these appearances on the right side; as to have the right lobe of the lungs distinguish'd with black spots, and the right auricle of the heart itself yellow and fill'd with serum; at the same time that the muscles on the left side, as well as the lungs, and the auricle, were perfectly sound: which difference you will not deduce from the virulence being carried into the blood from the wound, nor from a certain disposition of the blood; but rather from the nerves on the right side being irritated; especially if you have an eye to the state of the auricles.

(*c*) Lettera cit. n. 29.

(*d*) Ibid. cit.

(*e*) Append. ad Obs. 6. hujus 10. Sect.

(*f*) De Tumor. præst. nat. c. 3.

(*g*) Opusc. 2. in Comment. Inst. Sc. Bo-

non. Tom. 1.

(*b*) De Med. l. 6. c. 10.

(*i*) Severin. c. 1. cit. supra ad n. 31.

(*k*) Vid. Murry Quæst. Med. Paris. propos.

die ult. A. 1749. n. 4.

35. But that you may account for the varieties which are to be observ'd in the effects of the viperine poison, in other cases; as well as in those which I spoke of just now; from one or other of the causes that I mention'd lately, I will take notice to you here of some of the principal varieties.

A vomiting, if you attend to the greater part of the observations pointed out, you will scarcely ever suppose to be absent. And yet Paulus (*l*), Aetius (*m*), and Avicenna (*n*), would not have spoken of it as they have done, if they had not seen it wanting in many; for the two latter say that they have seen it “sometimes,” and the former that it happen'd in “some persons.”

Nor does Courtenius (*o*), though he speaks of many dogs, and among other symptoms does not spare to mention a kind of lethargic stupor; which is otherwise not taken notice of by many; as the “usual” effect of this poison; give the least hint of a vomiting: nor is this done in the experiments of that second scholium; nor in those of that sixth observation, which we have referr'd to above, from the Sepulchretum (*p*); if you except one however, the words immediately subjected to which expressly say, “no vomiting was the consequence.”

In like manner in these experiments, and those of Courtenius, I do not see that intestinal discharges which were worthy of notice, are spoken of; and yet the violence of these discharges, or their peculiar nature, has been observ'd by many authors: and the celebrated Mead (*q*) has said, in respect to the dog which he had infected with this poison, by introducing the needle infected therewith: “the usual disturbances came on, vomitings, stools, &c.” And certainly, in the third example of a man bitten by a viper, which is describ'd by the Parisians (*r*), it is very evident how violent both of them were.

But in the two which precede that, stools are not so much as mention'd; nor yet formerly by Dioscorides (*s*), Aetius (*t*), Paulus (*u*), or Avicenna (*x*): the three first-mention'd of whom take notice of “tormina,” Avicenna “a heaviness in the back,” all of them “a difficulty of urine;” and indeed, instead of this, Aetius mentions “bloody urine,” and almost all of them “bloody gums.” Yet I do not remember to have read of these, and the difficulty of urine, in later observations.

Bloody urine, however, is taken notice of in both the dogs of Hardeus (*y*); and I know that the man, spoken of in that first example among the Parisians, complain'd of his back, and of tormina; and likewise that the young man of Charasius (*z*) complain'd of severe and continual pains about the navel: and in him also was a tumour of the lips, which Redi (*a*) says was mention'd by Avicenna.

If this author therefore, and those other ancient physicians, have not

(*l*) De Re Med. l. 5. c. 12.

(*m*) Tetrab. 4. S. 1. c. 21.

(*n*) Canon. l. 4. F. 6. tr. 3. c. 32.

(*o*) §. cit. supra ad n. 16.

(*p*) n. 33.

(*q*) Tent. 1, cit.

(*r*) cit. supra n. 29.

(*s*) (*t*) (*u*) (*x*) capitib. cit.

(*y*) Sepulchr. S. hac 10. in Additam.

Obf. 2.

(*z*) supra n. 34.

(*a*) Osservaz. cit.

not omitted the less frequent symptoms ; so much the more reasonable does it seem to suppose, that they would have spoken of intestinal discharges, if they were so frequently observ'd by them.

But I do not remember one author, either among the ancients or moderns, who has not seen convulsions, and has not spoken of them either under this very name, or under that of convulsive motions, tremors, tensions, or horrors ; or at least who has not produc'd some symptom which could not be easily explain'd without them.

I omit other things which I am not at leisure to produce : I omit all the symptoms I have spoken of but vomiting ; which I have said to have been so frequently observ'd ; and which deserves so much the more attention here, as the Parisians, who have acknowledg'd it to come on “ pretty constantly,” have nevertheless denied that they had “ generally ” found any mark of inflammation in the stomach, and much less of gangrene : so that, in the great number of animals which they had dissected at least, it seems that it ought to be accounted for from the nerves being vellicated and convuls'd.

36. Nor indeed can we easily dissent from that very learned man, whom I have often commended, when he thinks that from thence we ought to deduce the reason why those who are bitten by a viper become icteric ; for the mixture of a very little poison cannot so soon change the nature of the particles in the blood, nor the mode of their mixture, as it can, by convulsively constringing the beginnings of the biliary ducts in the liver, retain the particles of the bile which ought to be continually thrown off from the blood.

I also give credit to him in this respect, that the colour of the whole skin becomes “ yellow ” within less than a complete hour : yet I suppose this to be sometimes only ; and not so often that we can pronounce an effect of that kind to be “ proper to this poison.”

And I remember indeed to have found Cardanus (*b*) wondering that “ those who are bitten by vipers, very frequently contract such a colour in “ the twinkling of an eye.”

But I have also read Donatus (*c*) since affirming, “ that men seldom become jaundic'd ” from a virulent wound ; and, for that reason, supposing this to happen only to those persons whose blood abounds with a very great quantity of bile ; which, if it be yellow, tinges the skin of a yellow colour ; if black, of a black colour ; and if porraceous, of a porraceous colour.

And that the skin was ting'd of this colour, and not very soon neither, is certain from the example of Galen (*d*), which he produces ; and with a citron colour, from another example which he quotes from Avenzoar (*e*) ; and not from the bite of a viper, as in the former, but from taking poison into the stomach.

To this add, that a yellow jaundice has been observ'd to come on from the pricking of spiders, as you have it in Etmuller (*f*) ; yet not always, nor

(*b*) Comment. in Hippocr. Aph. 62. l. 4.

(*c*) De Med. Hist. Mirab. l. 1. c. 9.

(*d*) De Loc. aff. l. 5. c. non 6. sed 7.

(*e*) l. 1. tr. 13. c. 6.

(*f*) Prax. l. 1. S. 17. c. 3. art. 4.

from the pricking of all spiders. For you may see, for instance, what considerable disorders that brought on of which Bernerus (*g*) speaks; and how different, and, frequently, how much more pernicious, those of which that learned man Brogiani (*b*) has written, under the name of the *Etruscum Phalangium*, or venomous spider of Tuscany, in a treatise which I could wish had been publish'd before I revis'd these letters that I had already written.

From them he also remark'd this, on account of which you may compare them with the venomous spider of La Puglia, and with that scorpion whereby I have said (*i*) that Peter a Castro had been wounded; I mean, that in the following year the symptoms return'd at the same time. Yet you will observe that, among so many different injuries, no writer makes mention of the jaundice.

Moreover, although Etmuller subjoins the following words, "That the ancients had already observ'd a jaundice, in general, to arise from the bite of the viper, as Zacutus Lusitanus, l. 5. Medic. Princ. Hist. 29. relates;" yet, if you examine this author, you will find that he relates nothing more on this head than Donatus, whom he follows more than any-one can suspect who does not compare them both together: yet he does not follow him well, where he describes the observation of Brasavolus (*k*) upon Tombesius; as if Donatus had produc'd this by way of an example which related to a jaundice brought on by the bite of a venomous animal.

Paulus, indeed (*l*), and Aetius (*m*), both of whom he quotes, have made mention of the jaundice from venomous bites: and, indeed, Aetius expressly says that it "is wont to happen" from thence. But both these authors speak of poisons in general: and not particularly of the viperine poison; and although the second mentions this for the sake of example, yet he asserts that the skin is from thence ting'd with a "porraceous" colour; and even when he has a peculiar treatise thereon (*n*) "with a leaden colour;" and Paulus (*o*), in general, supposes "a depravity of colour," which Avicenna (*p*) says is "inclin'd to greenness."

And that you may conceive the jaundice to be not always produc'd, and to be of different colours in different persons; I would have you observe that Dioscorides (*q*) had written, that "a whitish colour is brought on" thereby: and that the most ancient of all these authors, Nicander (*r*), has said,

*Nigricat ipsa cutis, plumbi modo fusca colore,
Cerulea interdum est, ærisve simillima flori.*

And to return to Zacutus; he has, in another place (*s*), an observation which relates very much to the present subject; an observation which I wonder is not transferr'd into the Sepulchretum, by reason of a gangrene found in

(*g*) Eph. N. C. Cent. 9. Obs. 49.

(*b*) De Venen. Animant. P. 1.

(*i*) Supra, n. 24.

(*k*) Comment. in cit. Aphor. 62.

(*l*) De Re Med. l. 3. c. 50.

(*m*) Tetrab. 3. S. 1. c. 17.

(*n*) Tetrab. 4. S. 1. c. 21.

(*o*) L. 5. c. 12.

(*p*) Cit. supra ad n. 35.

(*q*) Cit. supra ad n. 34.

(*r*) Apud Severin. Viper. Pyth. P. 3. c. 1.

(*s*) De Medic. Princ. Hist. l. 2. Hist. l. 5. Obs. 20.

the liver. That is to say, two reapers who were fast asleep, having been bitten by the same viper, and both being agitated by convulsions an hour after; one of them “fell into the most yellow jaundice after ten hours; and the “other,” who could not be sav’d, “fell into the most black jaundice after “fourteen hours; so as to bear the resemblance of an Æthiopian.”

But what varieties of the icteric colour later observers than Zacutus have remark’d, I cannot say; as, in the examples of the human species that are describ’d, perhaps, on account of the regions wherein they were being less hot, I do not remember any mention to be made of the jaundice: nor yet in the great number of brute animals, whose eyes, at least, while they were yet living, or membranes, here and there, when dissected after death, would have shown an unusual colour (especially a yellow one) even to the most curious examiners.

37. Thus you have a long discourse upon the viper, (though, perhaps, not without its use in your studies) from comparing, one with another, the writings which were in my hands, not only of the ancient, but also of the modern authors: so that I think you cannot retort upon me what was formerly retorted, in regard to the letters sent to Lancisi (*t*), upon the poison of the asp, by gentlemen very learned, and in other respects very humane towards me; I mean, “that it would, perhaps, have been better to have made use “of my own experiments, than of the authority of Aetius, and the rest of “the ancients, who frequently proceed too incautiously in these matters.”

I have here, without doubt, made use of the experiments also of the most cautious moderns: and these I would likewise have made use of in that disputation, if any such had existed. For I had none of my own experiments to send you upon the viper, as I was always taken up with various and various other occupations; even when my time of life would have permitted me to make them; and as I was always averse to experiments so full of danger, which would either have been injurious to me, as they had been to others, who had been long exercis’d in them (*u*), or would, at least, have created irksomeness and detestation (*x*).

But supposing I had not been restrain’d by these considerations; I do not see how these very learned men could expect that I should have made experiments upon asps, who have never been in Africa, and still less in Ægypt. For Strabo (*y*) writes, “that the Ægyptian asp,” of which our disputation chiefly was, “has something peculiar to itself, in preference to the asps “of other places.” For as to asps being spoken of as having been found out of Africa, and even in Italy itself, both by ancient and not ancient authors; without doubt, these writers have been led by the opinions and expressions of the common-people.

For “what we commonly call asps have scarcely any resemblance to those” of

(*t*) In Append. ad Metallothecam Vatica.
nam Mercati.

(*u*) Vid. Gentili Annotaz. alla pag. 73.
v. 25. della Lett. Filos.

(*x*) Vid Redi Lett. int. alle Opposiz.

(*y*) De Situ Orb. l. 17.

which we were speaking, as Salmasius (z) has justly imagin'd : and, certainly, neither Lucan (a) would have said of the asp,

*Ipsa caloris egens, gelidum non transit in orbem
Spente sua, Niloque tenuis metitur arenas ;*

nor would it have been thus spoken of by Ovid (b),

Plenaque somniferis serpens peregrina venenis ;

if “ these species of serpents ” were not, to use the words of Celsus (c), really “ not only foreign, but somewhat more pestiferous ; and especially those that “ are generated in hot places.”

Nor is this to be wonder'd at ; since even within Italy itself the venomous wounds of some animals have different effects, in proportion as the places are more or less warm. Thus the tarantula, says Baglivi (d), “ is only poisonous “ in La Puglia ; and especially that which is found in the plains : for that “ which is found in the mountains round about, either has no poison at all, “ or not one which is hurtful : ” and still less even those tarantulæ of the plains, when carried into the other regions of Italy ; as even the history propos'd (e) confirms.

We, certainly, have not such a country as Lombardius (f) observes the Irish to have, when he from thence deduces the reason why he could never see any poisonous animals there ; and why the different animals of this kind which he had brought from England, were seen, for the most part, to die inflated and convuls'd, almost as soon as ever they were let loose on Irish ground.

Yet if the same thing had happen'd to the asps when brought here from Africa, as happens to the tarantula when carried elsewhere from La Puglia, must not my experiments have of course fail'd me ?

Since, therefore, there was no possibility of making experiments without being very doubtful ; and since, if there had been, the business of writing immediately, in which I was, for more than one reason, necessarily employ'd, would not have given me time to make the experiments ; what was there left for me to do, but to make use of the testimonies of those persons who had either themselves seen the effects of the bites of an asp, or had read the writings of those who had seen these effects ?

38. And here you will, without doubt, enquire of me, in regard to the disputation which I had with that very eminent man Lancisi on the kind of death which Cleopatra suffer'd, what I really thought in my own mind ; since it seems to have been undertaken by me, as frequently happens betwixt friends, for the sake of exercise and speculation : nor is any-thing publish'd by me by way of reply to his second answer.

I, however, in an affair which could not be certainly determin'd without

(z) Plinian Exercit. in Solin.

(a) Pharsal. l. 9.

(b) Metam. l. 9.

(c) De Medic. l. 5. c. 27. S. 10.

(d) Differt. de Tarant. c. 7.

(e) C. 11. Hist. 8.

(f) Eph. N. C. Dec. 3. A. 3. Obs. 79.

the testimonies of the ancients, having happen'd to observe these remarks, made by Lancisi in the *Vaticana Metallotheca* (g), upon the image of dying Cleopatra: "On her arm is seen the asp, by the bite of which it is the vulgar opinion that Cleopatra died; although others contend that she kill'd herself by a draught of poison:" and suspecting that some passage was extant, in an ancient author, to this effect, though unknown to me; I had a view to nothing else, in both the letters, but to get the knowledge of this passage, if there were such a one, from Lancisi.

With this intention I wrote once, and a second time, to him, such things as could be immediately advanc'd and affirm'd by me in favour of the more common opinion. And though I understood, from the first and second of his letters, that there was no passage of this kind; I readily, however, pursu'd his desire to make an end of the disputation; especially in a controversy which had begun and proceeded, on the one hand, with such a diffidence, and, on the other, with such politeness and condescension, as to obtain great praises from learned men (h): so that it is not to be doubted, but one of these gentlemen, by whom it is said to have been "very acrid," had nothing else in view but the ready, nervous, and full-strain'd arguments, that were made use of on both sides. For he is very favourable to both of us; and he ascribes so much merit to me, in consequence of a humanity which is equal to his doctrine and erudition, that I dar'd not even wish for such ascriptions. But I return back to my subject.

I, therefore, did not think proper to make any corrections, when, almost two years after, it happen'd that Lancisi was to add an appendix to the *Metallotheca*; and wrote to me, that it was the pleasure of our most holy master that this disputation, which he had been so condescending as to read, should be publish'd with it; and that his holiness desir'd he would signify this to me, if I should wish to make any alterations or corrections in my letters, as he had done in his. For I wrote back to him, that the command of our master must be obey'd; and that it would be the more readily perceiv'd by every-one, that these letters were not written by me with an intent to publish them, if they came out in the same extempore dress in which they were first penn'd.

Nor, indeed, were the things I might have added of any great moment; yet some things there were which I shall now point out to you: not, however, in order to renew the controversy after it has subsided, nor to set up the common opinion as a certain one; but only that you may not suppose there is nothing at all to be said in behalf of one or the other opinion. Some of these arguments are to be taken from historians, some from physicians, some from both, and some from still other authors.

Among the historians, Vellejus (i), Ælianus (k), and Florus (l), have asserted with common and full consent, and without any doubt, that Cleopatra kill'd herself by the bite of an asp. But Vellejus was addicted to the vice of flattery and adulation above what can be believ'd; and is not reckon'd

(g) Ad fin. Armar. 10.

(i) Hist. Rom. l. 2. c. 87.

(h) Giornale de' Letter. d'Ital. Tom. 33.
P. 2. Art. 8. in fin.

(k) De Hist. Animal. l. 9. c. 61.

(l) De Gest. Rom. l. 4. c. 11.

among the historians by Quintilian : Florus has suffer'd himself to be carried away by a childish desire of saying wonderful things, even at the expence of truth : and if to these accusations, taken from Sigonius, Lipsius, and Scaliger, you add another, taken from Verderius (*m*), against Ælianus ; this author, also, recedes from the truth, while he endeavours to seem a different person from Aristotle.

Yet it would have been much more easy to produce the praises of each historian from a much greater number of authors, than to have search'd out these accusations in some of them.

These praises, however, I omit ; since it is sufficient to observe, in respect to the accusations, that it was of no importance to Aristotle of what kind of death Cleopatra should die in future times : and there was nothing wonderful in this, that she who, after having made the experiment upon criminals, had found for a certainty, no poison to be more speedily and mildly fatal than that from the bite of an asp, should make use of the same to destroy herself : and, finally, there was no adulation in respect to Augustus, by saying that she died of this bite rather than by a draught of poison.

For as to Vellejus not being nam'd among the Latin historians by Quintilian (*n*) ; neither is Cæsar himself nam'd : I suppose, because he did not consider the writings of either of them, though commendable, in the light of regular history, of which the question was in that place ; since Cæsar had left his book in the form of memoirs, or commentaries ; and Vellejus, having promis'd a larger volume in more than one place (*o*), had touch'd, in general, only upon the principal heads of his narration.

39. But to these three historians are oppos'd an equal number who have not affirm'd the same thing ; as Suetonius (*p*), Plutarch (*q*), and Dio (*r*) : and it is even contended, that greater credit is to be given to the two last authors, by reason of their being Grecians ; and, therefore, accusom'd to enquire after the truth of history with greater diligence than the Latins : particularly in an affair which relates to the Grecian empire ; and as they are, if you attend to the places, more near to the spot ; and, if you attend to the proofs of facts, better furnish'd therewith.

I do not intend to mention that saying of Quintilian (*s*), “ There is generally a licence in the Grecian histories, similar to that of poets ;” and still less that of Juvenal (*t*),

Quicquid Grecia mendax audet in historia :

“ Whatever glaring falsity Greece dare assert in history.”

And, indeed, I readily confess that there were excellent historians among the Greeks, by the help of whom we may even learn the Roman affairs ; especially as to what relates to the public rites and ceremonies.

For these customs, and other things of this kind, (as I think I have read

(*m*) Censur. in Auctor.

(*n*) Instit. Orator. l. 10.

(*o*) L. 2. c. 48. 96. 99. 103. 114. 119.

(*p*) De duodec. Cæsar. l. 2. c. 17.

(*q*) Græc. Rom. q. Ill. Vit. in Anton.

(*r*) Rom. Hist. l. 51.

(*s*) Instit. Orat. l. 2. c. 4.

(*t*) Juvenal. Sat. 10.

in a certain epistle of Grotius) foreigners remark and deliver down, more punctually than citizens; as the latter suppose that it was to no purpose to give an account of customs which were so well known to every-body.

But we also learn a great many circumstances in regard to the political transactions of the Romans, from those great historians among the Greeks; and in particular down to those times wherein the Latins, at length, began to write their own actions with a greater degree of elegance.

For even “from the beginning of the Roman state,” as Cicero asserts (*u*), “quite down to the time of P. Mutius the *Pontifex Maximus*, all the public transactions of every year were wont to be committed to writing by that supreme officer of religion;” the manner of which annals, he says, “had been imitated by many, who left, without any ornaments, only the monuments of times, men, places, and affairs that had been transacted;” as the elder Cato, Pictor, and Piso: which, without doubt, was the reason why their writings did not come down to us, contrary to the fate of those writers who took upon them to speak of the Roman affairs, in more elegant and pompous language.

And I think I do no injustice to the merit of any-one, if, in regard to the mode of the action, which is chiefly in question here, and which increases the glory of neither party, I give more credit to one Latin author, in Roman history, than to two Grecians.

And to what purpose is it to shew, whether the war finish’d by Augustus, by the conquest of Antony and Cleopatra, so as to drive them to the necessity of killing themselves, relates to the Roman or to the Grecian history; since both of them were Roman generals, and the prize of war was the kingdom of Ægypt reduc’d into a Roman province?

Yet Cleopatra was a Grecian, and that was a Greek kingdom; as their empire and their language flourish’d at Alexandria. Let it be so; for who denies it? The ancient origin both of the queen and of the kingdom were from the Greeks.

But do you, therefore, suppose the Grecian laws, customs, and language, to have reign’d in that kingdom after almost three hundred years? or the Ægyptian? or some other? a kingdom, whose kings, as Plutarch (*x*) himself confesses, had, before, “even not learn’d the Ægyptian language, nor left the Macedonian:” and that part of the people which had been “anciently from the Greeks, and was not unmindful of the customs and manners common to the Greeks,” had already “dwindled away” in the age of Polybius, as Strabo (*y*) asserts.

For as to what is said of Plutarch and Dio being nearer in respect of place, and better furnish’d with facts; it is so long a tract of land that disjoins Bœotia and Bythia, of which countries they were, from Ægypt, that it may seem not to be a very much greater extent which is interpos’d betwixt Ægypt and Italy.

But, what is principally to be consider’d in historians, there was, certainly, a less interval of time betwixt the death of Cleopatra and the time of Vel-

(*u*) De Oratore, l. 2.

(*x*) In Antonio.

(*y*) De situ Orbis, l. 17.

lejus, than that of Plutarch ; and of Ælianus, than that of Dio. And can we suppose that Plutarch receiv'd the more certain proofs of facts from his grandfather, when relating what he had heard from Philotas, an intimate acquaintance of one of Anthony's cooks ; or that Vellejus, who liv'd very near to that time, might have frequently heard, both in peace and war, (in the functions of which (z) he was very well vers'd, and, like his noble ancestors, had obtain'd illustrious posts and badges of glory) the relations of these facts from eminent men who had been with Augustus at Alexandria ?

But if, as to this author, is objected his adulation towards Tiberius, who was then living, and not yet come to his worst, but had, as Tacitus (a) says, “ a mixture of good and bad during the life of his mother ;” with whose death Vellejus has made an end of this his history, sending it soon after to Vinicius, who was consul in the following year ; so we should be inclin'd to accuse Dio and Plutarch ; the censures of Vallesius, Rapin, Bodinus, Vossius, and Lipsius, which expressly charge the former with plagiarism, with deviation from truth, with hatred against the most virtuous characters, with frequent adulations, and with frequent blunders, would not be wanting ; nor the censures of other authors to charge the latter with a great want of knowledge in the affairs of the Romans ; and not only of the very ancient transactions, but of those that have happen'd in not very ancient times : examples of which kind ; to omit what is said in Lambinus (b) ; Paulus Manutius (c) produces a great number of, even in regard to one fact : and wonders “ that he should blunder so shamefully ;” which he also says, in other places (d), had happen'd to the same author “ frequently :” although Bodinus (e) denies this to be surprising “ in a man who was a native of Greece, “ and confesses, in the life of Demosthenes (f), that he did not understand “ the Latin language sufficiently well.”

And of the same kind is that accusation mention'd by Rhodius (g), that Plutarch, “ having made use of the Latin codexes, was very often deceiv'd “ in the affairs of the Romans.”

Nor are those mistakes unknown, which Robortellus, an author whom I have commended heretofore (h), had remark'd in the same author, even in regard to the names of the Romans : nor that which Lipsius (i) says, where he expressly denies, not only that Plutarch, but that the Grecian historians in general, are to be prefer'd to the Romans ; especially in those things that relate to foreign nations ; and contends that the former “ had not only err'd “ in regard to the facts themselves, but had shamefully blunder'd about “ proper names in particular.”

I, however, on account of the other very great merits of both these historians ; I mean, of Dio, and Plutarch in particular ; omit these objections the

(z) Vid. Voss. de Hist. Lat. l. 1. c. 24. & Boecleri Indic. Vellejanum in *Vellejus*, cui adde Velleji, l. 2. c. 124. in fin.

(a) Annal. l. 5. in fin.

(b) Adnot. 16. in Cicer. Orat. pro Dejot.

(c) Comment. in Epist. 1. l. 2. Cicer. ad Q. Fr.

(d) Epist. 5. l. ejusd.

(e) Meth. Hist. c. 4.

(f) In Proœm.

(g) Not. ad Scribon. Epist.

(h) Epist. ad Cel. Polen. de III. Consul. Frontin.

(i) Var. Lect. l. 3. c. 20.

more willingly, because neither of them, any more than Suetonius; who was himself likewise so much later than Vellejus; denies, finally, what this author has asserted in regard to the kind of death whereof Cleopatra died: and although they do not affirm it, yet they have many circumstances from which, join'd together with the diagnostic doctrine of physicians, to whom we pass on, we may defend the opinion of Vellejus.

40. For Dio (*k*) affirms, "that only small punctures were found in the "arm" of Cleopatra after death: "two" of which punctures Plutarch (*l*) also takes notice of. And the same author and Suetonius (*m*) assert, that "*psylli* were brought by Augustus, that they should suck out the poison." From whence, then, should they suck it, except from these envenom'd punctures? For how advantageous a remedy suction must have been, when applied thereto, is sufficiently demonstrated above (*n*), from the opinions both of ancient and modern physicians.

And that these very small punctures, and in number two, agree very well with those things that the same ancient physicians have deliver'd down, with universal consent, in regard to the bite of the asp, the second letter of mine demonstrates.

For they have been universally compar'd to little obscure wounds that are inflicted by "a needle;" and almost all of these authors have asserted that they were "without any swelling;" and some have not omitted to tell us that they were "two in number."

Nor would I have you despise their united testimonies, as if they had copied from one another; for they did not always write from the knowledge of other persons, but from their own likewise: and this you will readily learn from reading them attentively, or from Freind's History of Medicine, where he has treated of each of them: and those things that they have advanc'd from the knowledge of other persons are, generally, the consequences of observations of excellent physicians; which, if they had not preserv'd them to us, we should be intirely ignorant of.

Nor because Dioscorides; who, nevertheless, had himself also previously asserted (*o*) the same things that were written by all, or almost all, those other authors, as I just now said; either was not the person we have heard was the domestic of Cleopatra, or has not made any mention of her being kill'd by the bite of an asp; are we, therefore, not to believe what he had said of the very small puncture without any tumour, which is the consequence of this bite: although the passages wherein Cleopatra was mention'd may, perhaps, like so many other things which Maranta refers to (*p*), have been lost from the codex of Dioscorides by the depredations of time: nor are there still wanting some persons who give credit to Suidas (*q*), when he asserts, that this was the very Dioscorides who "liv'd in Cleopatra's palace under Anthony;" as we have, in my opinion, some circumstances whereby the arguments of those who think otherwise are call'd into question.

(*k*) L. 51. cit.

(*l*) Vit. Anton. cit.

(*m*) C. 17. cit.

(*n*) N. 29.

(*o*) De Medic. Mat. l. 6. c. 54.

(*p*) Meth. cognosc. Simplic. l. 2. c. ult.

(*q*) Historic. ad Vocem *Dioscorides*.

But to pass over these things ; I certainly do not think you will be stagger'd by this consideration, that it does not seem probable the traces of so pernicious a bite should be so slight and obscure as the ancients have taught ; but rather be led thereby to inquire into the cause of this admirable circumstance, as they had even attempted to do in the time of Ælianus (r).

For they thought that this cause must be suppos'd to consist in " the surprising celerity " wherewith that poison " passes on to the internal parts : " by which means, externally, " there is nothing of a prominence or tumour ; " and for this reason, " says he, " it was not easy for the party of Octavius " to discover in what manner Cleopatra had brought about her own death ; " till at length, after a long enquiry, they discern'd two punctures that were " difficult to be seen."

And if you chuse to illustrate this ancient thought by a recent explication ; you may so much the more easily make use of that which we have often made use of above, when we suppos'd the poison to attack the nerves, in proportion as it is more evident, that this happens from the poison which the asp inserts by its bite ; and which is call'd " soporiferous " by Ovid, as I have before related (s) ; as the asp itself is call'd " somniferous " by Lucan (t) ; and with the same view, according to the opinion of the most learned men, by Helvius Cinna (u), *somniculosa* ; and expressly by Solinus (x) " hypnale : " and thus he explains it, " The hypnale kills by sleep, an instance " of which we have in Cleopatra."

For in what manner ; unless you say that the efficacy of this most minute poison is carried to the brain very speedily, by means of the nerves ; will you explain the following things, which I will quote in the words of Lucan (y), when speaking to a person wounded by an asp :

Nulloque dolore

*Testatus morsus, subita caligine mortem
Accipis, & Stygias somno descendis ad umbras.
Non tam veloci corrumpunt pocula letho ; &c.*

And I have us'd the words of more than one poet, not because, in regard to the somniferous poison of the asp, and of " the speedy dimness " from thence, as Dioscorides himself (z) says, the words of physicians were wanting ; but that you might perceive the efficacy of this poison to have been so commonly and certainly known to be hypnotic, as to be not only consider'd in that view by physicians, but even in the writings of poets also.

The brain, therefore, being so speedily and vehemently attack'd, it is not surprising if the other parts of the body, which depend thereupon, are soon after depriv'd of their strength ; just as if an universal paralysis were brought on ; and, therefore, that the motion of the blood being instantly stopp'd, especially through the small subcutaneous branches, a redness, a lividness, or a tumour, can scarcely more shew themselves in the punctur'd part, than if a mere carcase were prick'd.

(r) C. 61. supra ad n. 38. cit.

(s) N. 37. (t) L. ibid. cit.

(u) Apud Gell. Noct. Attic. l. 9. c. 12.

(x) Polyhist. c. 29.

(y) L. cit.

(z) C. 54. cit.

And thus it seems, that where the most instant death follows the bite of an asp, the case may be explain'd : and, indeed, how speedy the effect of it was in Cleopatra, is manifest from those things that Plutarch (*a*) relates.

41. Aetius (*b*), you will say, has indeed asserted, that from one species of asps follows the "most instantaneous" death; but that from another species death follows only "in three hours at most:" nor are some wanting who assert it to be still more slow; and not to happen till after the body has become green and discolour'd.

And, indeed, the author of the book *De Theriaca* to Piso (*c*), although he confesses that asps "do really kill very speedily, as he frequently saw in " Alexandria the Great;" nevertheless, sufficiently shews, by immediately subjoining the following things, that the persons bitten do not immediately fall down therefrom: "For when they do not chuse to kill any criminal by " this kind of punishment without long torture and delay, they apply the " asps to their breasts, and make them walk about a little, and by this means " kill them in a short time."

And even Plutarch (*d*) relates, that one of the servant-maids of Cleopatra was found fitting the diadem to the queen's head, and not incapable of speaking. I grant it; but she was half-dead: and immediately fell down, after uttering a few, and almost inarticulate words.

Nor did they who walk'd about *a little while* fail, for that reason, to die *in a short time*, and *speedily*.

And if any persons dragg'd on their life to a longer extent of time, it is not at all surprizing that they should, at length, have their bodies discolour'd and green, for this very reason: but if this had been common to all thus bitten, the psylli would not have been made use of to Cleopatra; for her body being, as Plutarch relates (*e*), "neither deform'd, nor bearing any other " mark of poison," besides those two punctures, would have demonstrated that she had not been bitten by an asp.

But I have disputed of these things in such a manner, as if, where some hours have pass'd betwixt the envenom'd blow and death, it cannot possibly be otherwise, but that the place, whereby the poison is introduc'd, contracts a tumour and a lividness.

Yet certain instances are extant, which shew that, even after five or six hours have been interpos'd, no lividness or tumour has appear'd in the place; as in the pigeons which Redi (*f*) kill'd by the wounds of an African scorpion. And in the dog which the scorpion of Montpelier had wounded, and which died six hours after the stroke, the celebrated Maupertuis (*g*) found no tumour in the part where the wound had been receiv'd; whereas a tumour is generally the consequence of the puncture of a bee or of a wasp; but in the place where every stroke was given, he found a red point only: and he denies that he had ever seen it otherwise, in the great number of animals upon which he made the same experiment.

(*a*) Vit. cit.

(*b*) Tetrabibl. 4. S. 1. c. 20.

(*c*) C. 8.

(*d*) Vit. cit.

(*e*) Ibid.

(*f*) Esper. int. agl. infetti.

(*g*) Comment. supra cit. ad n. 25.

And to turn my discourse from the asp to an animal very similar thereto; that is, the viper; you know, for a certainty, from what I have said above (*b*), that in the whelp of Francini, no part of the body was livid, or tumid, even many hours after it had receiv'd the fatal bites from a viper; and that in the finger of a noble youth (*i*), which a viper had wounded, in such a manner as to produce the most violent symptoms, though with one tooth only, a tumour at length appear'd, after some hours; whereas to that very time, nothing could be distinguish'd but "a puncture not larger than " that which is made by a small needle: the foramen appearing very small " on the surface, and being attended with the slightest redness; so as to be " known by the colour alone."

And if it is sometimes no more from a viper, how much less will it be from an asp, the poison of which, by creeping on so speedily to the brain, does not leave time to the wounded part to be livid, and raise itself up into a tumour.

42. Now we are to see what Plutarch and Dio, if they are join'd with other authors besides, supply us with in order to defend the common opinion more easily. In the first place then, we have this from Plutarch (*k*), that Cleopatra, who was a woman neither of a stupid, nor a humble mind, having foreseen, before she came into the power of Augustus, what fate might await her; had resolv'd to die, rather than from a queen to become a slave, and be carried in triumph before the chariot of the victor.

With this view, that she had procur'd a great quantity of poisons, and had made experiments, with each of them, upon the bodies of criminals who had been capitally condemn'd: I mean, that she might choose out, for herself, a poison whereby she should die not only without pain, but very speedily; lest, if death should be slow in coming on, she might be compell'd to live, by the unwelcome assistance of remedies.

Which of all these, then, should we suppose she had selected? She would, without doubt, have rejected minerals, as being contrary to both these her wishes, if they had been us'd by way of poison at that time; which I do not ever remember to have read of; especially as those chymical artifices, whereby their powers are exasperated, and made more pernicious, were unknown.

The poisons in use were from vegetables and animals: nor was various art wanting to make them speedily fatal. One of these artifices we learn from Suetonius (*l*), when a poison, which kill'd within five hours, being, soon after, "boil'd and reboil'd frequently" by Locusta; I suppose that the much greater part of the aqueous particles being dissipated, the poisonous ones might be more crowded together; "became instantly fatal."

And although this poison; whether it consisted of the juices of vegetables, or animals, or of both; was probably known to Cleopatra, as that certainly was which was taken from animals, and made use of by savage nations to tinge their arrows; a poison of the same kind with that, among the Scythians,

(*b*) n. 34.

(*i*) *Hist. ibid. indicata.*

(*k*) *Vita cit.*

(*l*) *De duodec. Cæsar. l. 6. c. 33.*

mention'd by Pliny (*m*), “irremediable,” as he says, “and bringing on death instantly by the slightest touch;” yet at the same time that she might approve the quickness of the death, she was averse to that very short, indeed, but very severe agony, the marks of which, I suppose, she would have known from violent convulsions; which I conjecture to have been the immediate consequences of that poison of Locusta, because Nero believ'd, that the deadly effect thereof might be conceal'd by a kind of epilepsy to which Britannicus was subject (*n*): and Mead (*o*) relates, that the water of Nichols, prepar'd from the lauro-cerasus, was very speedily fatal indeed; but not without violent convulsions: and finally, it appears from the experiments of Reaumur (*p*), that animals slightly prick'd with the points of arrows, when daub'd over with a certain poisonous composition, by the inhabitants of the coast of Maragnonia, had died very soon indeed; but, as he particularly relates of a bear, that, before death, they had been shaken and agitated by convulsions.

For these, and other reasons similar thereto, I suppose, then, Plutarch related of Cleopatra, that, having first tried other poisons in vain; as they did not well answer both her intentions; she turn'd her thoughts to animals, as Dio also asserts (*q*): and after having tried animals likewise for many days, in vain, at length found that “the bite of the asp was almost the only poison” whereby she could have both her ends answer'd.

And if you attend to all these circumstances; you will easily understand why, rejecting other poisons which kill'd instantaneously; some of which she had at hand, as I shall show below (*r*); it is by far the most reasonable to suppose that she prefer'd the bite of the asp; especially as the other things that are said above of those two very small punctures, and of the psylli being applied (*s*), exactly agree therewith.

For as to a learned man, perhaps, seeming, to those who may read him with but little attention, to have thought of the psylli, as if they had been applied by Augustus, only through a kind of mockery; it is sufficient to inspect Suetonius (*t*), and Dio (*u*), in order to see plainly that it was done by Augustus, with intent that Cleopatra “might be sav'd to adorn his triumph, as he earnestly desir'd:” and that, after he saw she could not be sav'd by the psylli, “who suck'd out the poison and the virus, he griev'd exceedingly; thinking himself depriv'd of all the glory of his triumph.”

And if he who was immediately present, and inspected the body, and by means of his power and ingenuity could examine into every circumstance, and make every necessary enquiry, suppos'd her to have been kill'd by the bite of an asp, as Plutarch (*x*) relates; “for in the triumph he bore the image of Cleopatra, having an asp fix'd to her by its teeth;” why should we

(*m*) Nat. Hist. l. 11. c. 33.

(*n*) Vid. Tacit. Annal. l. 13.

(*o*) in Append. post Tentam. 5. de Venen.

(*p*) Hist. de l' Acad. R. des Sc. A. 1747.

Obs. Anat. 1.

(*q*) l. 51. cit.

(*r*) n. 44.

(*s*) n. 40.

(*t*) c. 17. cit. supra ad n. 39.

(*u*) l. 51. cit.

(*x*) Vita cit.

434 Book IV. Of Chirurgical and Universal Disorders.

not believe what he believ'd? especially as other corroborating circumstances are moreover added, which we shall immediately produce from the same Plutarch, from Dio, and others, even medical authors.

43. For what is to be argued from the circumstance related by Plutarch (y) for a certainty; I mean, that on the same day whereon Cleopatra died, and even a few hours before her death, a box was brought to her out of the fields, “full of figs, and cover'd with leaves,” but that which he tells us was afterwards said, that the asp had been hidden in the box?

And this Dio (z) also relates from others; although he says, “that an asp was brought in an urn, or among some flowers;” and the author of the book *De Theriaca* (a), that it was “cover'd over with figs and grapes.” And while I attend to these relations, I seem able, at the same time, to conjecture what species of asp it was.

For as they have asserted that there are three species (b); calling some ptyades, others terrestres, and others chelidoniæ; and have said that those of the first species were “of the length of two cubits,” the second sometimes “of the length of five cubits,” and that the third species were found to be only “a little longer than a cubit;” these last, not only as more easily to be found; having their lurking-places about the banks of rivers, “and especially about the Nile,” which was so near; and in like manner as bringing on a more speedy death than the others; for from the bite of these “the most instantaneous death comes on;” and not only these circumstances, but being much more easily conceal'd under flowers and leaves, by reason of their shortness; these last, I say, I do not doubt were more convenient for Cleopatra, and particularly more proper to deceive those who kept guard at the gate.

And herewith agrees the very ancient and learned artist of the Vatican statue, who, not only very skilfully express'd the dying Cleopatra as if in a placid sleep, but also plac'd upon her arm a short asp, and that on the left arm; having, I suppose, taken this idea from some ancient writer, from whom Orosius (c) likewise, otherwise an historian of the fifth century, seems to have taken it.

But whether the affair was manag'd in this manner, or, as others, spoken of by the same Plutarch (d), related, “the asp was kept shut up in a certain vessel, and brought forth by Cleopatra through a golden pipe;” either one or the other relation has a final tendency to prove that she suffer'd herself to be bitten by an asp.

You see then, that what has been related by Plutarch, and others, agree with the things that have been asserted by Vellejus and several authors spoken of in the beginning. And the author of the book *De Theriaca* (e), whom I mention'd before, sufficiently shows that the same opinion was the most probable to him. And whether this author was Galen, or some other, at least, who was cotemporary with Galen; as he says (f), that Androma-

(y) Ibid.

(z) l. 51. cit.

(a) c. 8.

(b) Vid. Aetii c. 20. supra ad. n. 41. cit.

(c) Historiar. l. 6. c. 17.

(d) Vita cit.

(e) c. cit.

(f) c. 5.

thus “ was not many years before him,” and “ that Marcus Antoninus “ had, some little time before, govern’d the Roman empire with the greatest “ integrity ” (g); he is not to be despis’d by us: since, if you consider his age, he was neither younger than Dio, nor finally, a great deal later than Plutarch; for it is certain, not only that Plutarch liv’d during the reign of the emperor Hadrian, but that Galen was born at that time; and if you attend to experience, he alone of all those authors that I have quoted above, expressly says, as you have read just now (b), that he had often seen, at Alexandria, in what manner, and how speedily, asps kill when applied to the body.

Nor because he says, that Cleopatra had made use of one of those call’d ptyades; which, however, I do not find to be asserted by any one of the older authors; will you suppose that she wish’d to do it for this reason, that she might be spit upon by the ptyades; for from thence “ death follows very slowly,” as is asserted by Aetius (i); but that she might be bitten: for this kind of asp bites, as the same author subjoins; and by biting, as Galen says in Paulus (k), “ brings on the most speedy “ death.”

And indeed, unless Paulus had his eye to some other passage of Galen, in the books that have been lost; he must have consider’d this very book *De Theriaca*, as one of Galen’s; and have taken from thence what he speaks of as said by Galen: I mean, these three kinds of asps, and the ingenuity of the ptyades, in reaching by his spittle persons at a distance from him; and Cleopatra killing herself therewith. For these things are said in both places.

But as to its being said in the book *De Theriaca*, that the queen had made use of a ptyades to kill herself, this Paulus has suppos’d, with great justice and propriety, is to be understood of the bite; for it was by no means necessary to apply it to her body, in order to be spit upon by it, as it was custom’d to spit afar off.

And as to those things that are soon after subjoin’d, in that same book, of the speedy death of condemn’d criminals, by applying an asp to the breast; perhaps Paulus, thinking that these circumstances were to be connected with the former, brought in Galen as leading to the licence of the painters and statuaries; as if he had said, that the queen “ had applied to her left breast “ an asp of the ptyades kind, and had been destroy’d by the bite of that “ animal.”

But we are prevented from believing this by Plutarch and Dio, who deny, as we have seen above (l), that there appear’d any mark of poison in her body after death; except two very small punctures in her arm. And this circumstance is also sufficient to show us, that it was not without reason the same author of the book *De Theriaca*, in relating a different narration of some other persons, did it in such words as show’d himself to be not at all satisfied therewith: a narration, that is to say, “ of a large and deep wound,” which

(g) c. 2.

(b) n. 41.

(i) c. 20. cit.

(k) De Re Med. l. 5. c. 18.

(l) n. 40. 41.

Cleopatra “ made upon her arm with her teeth ; and of poison which she “ had previously procur’d from the asp, being brought to her in a certain “ box, and infus’d into that wound ” soon after.

44. But those very small punctures in the arm, as they disprove the report of a large and deep wound in the arm ; so they exceedingly well agree, you will say, with another narration, which is extant in Dio (*m*), though not in the author of the same book : I mean, that Cleopatra had taken the needle, or bodkin, which she was wont to pin up her hair with, and wear constantly therein, from her head ; and after having daub’d it over with the most virulent poison, had prick’d her own arm with it.

But I would have you read Redi (*n*), where he admonishes you, in consequence of his own experiments, that if the wound you make be narrow, it is difficult to introduce the poison : and whatever the wound may be, that the animal does not die so soon after having the poison of the viper injected into the wound already made, as after the bite of the viper itself.

And after these considerations, can you suppose, that she who wish’d the most certain, and most speedy death, would have made use of an uncertain and less speedy method of dying ? And yet our disputation was not of poison being thus introduc’d, but chiefly of poison being drunk.

And as there is no-where any mention made of that, as I have said above (*o*), in so many narrations ; lest you should happen to think that this passage of Plutarch (*p*) may be suppos’d to refer thereto : “ It was found that “ Cleopatra had poison in a kind of hollow plate which she conceal’d under “ her hair ; ” and lest you should suspect it to have been that, or similar thereto, wherewith she, having smear’d over the flowers of her banquetting garland, and thrown them soon after into a bowl, “ had commanded a person brought out of prison to drink thereof, who instantly expir’d ; ” as you have it in Pliny (*q*) ; or of the same nature with that, which, not many *lustra* after the death of that queen, was sent from Alexandria to Jerusalem to kill Herod ; as Josephus (*r*) has said ; that is, the virus of asps, and the “ poisonous juices of other serpents,” by the drinking of which poison “ a “ criminal capitally condemn’d died immediately ; ” lest then, I say, you should suspect these things, I will not produce this passage from the same Pliny (*s*) : that the poison of asps, “ when drunk in the largest quantity, is “ not hurtful. For there is no contagious efficacy therein : so that the animals kill’d by the bite of this creature, are not improper for food ; ” which things agree with the experiments of Redi, and others, upon the viperine poison (*t*) : nor will I say the other things in general, which I have hinted at in my second letter to Lancisi, from whence you may conjecture that this poison rather related to that wherewith Dio has said the hair-needle, or bodkin, was besmear’d ; that is to say, one which was not injurious, as he openly asserted, except introduc’d into a wound.

I will only add one thing from the same Dio and Plutarch, from whence you may very clearly and instantly perceive, that Cleopatra did not die from

(*m*) l. 51. cit.

(*n*) Lett. int. alle Opposiz.

(*o*) n. 38. (*p*) Vita cit.

(*q*) Nat. Hist. l. 21. c. 3.

(*r*) De Bello Jud. l. 1.

(*s*) Nat. Hist. l. 29. c. 4. (*t*) *supra*, n. 30.

the taking of poison, which she carried in a hollow plate under her hair.

For Dio (*u*) relates, as fact, that before she kill'd herself, she gave to Epaphroditus, to whom the custody of her was committed, a letter to be carried to Augustus, that he "being remov'd from his post, under the pretence of sending a letter to Augustus, she might have opportunity to execute what she had propos'd."

Plutarch (*x*) likewise had asserted without any doubt, that the queen, when about to kill herself, had given a letter to be carried to Augustus, "and having dismissed all her attendants, but two women, had shut the gate." To what purpose was it then, I pray you, that she should send away Epaphroditus, and the other attendants, from about her, and shut the gate, in order to take poison from that hollow plate?

She, therefore, must have intended to do something else which she could not do without the removal of all witnesses, who would have prevented it: that is to say, she intended "to handle fierce serpents, in order to drink the black poison from them, by her body," as Horace (*y*) says, and not by her mouth.

And the testimony of this author I consider as of very great weight, not only for other reasons which I have hinted at in the letters sent to Lancisi; but, in particular, for this reason, that he, to use the words of the younger Pliny (*z*), "has follow'd the relations which were made of the fact immediately after its transaction; at which time they have generally the most truth in them."

45. Do you think, then, it was any-thing else but the handling of the asps which Cleopatra could do, and perhaps did, when all her attendants were remov'd, in order to afford her an opportunity of killing herself with poison? When I had written thus far, I accidentally lit on a passage of a Greek author, and a cotemporary of Vellejus, which I think should not be omitted in this controversy.

For Strabo (*a*) has said the following things: "Cleopatra kill'd herself by applying, privately, the bite of an asp; or with a poison smear'd over her; for it is said in both ways."

It appears, therefore, that, if she was determin'd to anoint her body with this poison, she ought to have shut the gate before, and kept no-body but her maids about her.

But before you say this, read Plutarch (*b*). You will see that, on this day, the queen, having made use of the bath, might have anointed her body with what ointment she pleas'd, as the custom was then, without any one being surpriz'd at it, or prohibiting it: that, after this, she din'd, and magnificently too, (from whence you might draw a new argument, that, therefore, she had not determin'd to kill herself soon after by swallowing or drinking down poison; as, by means of having made so many experiments, she could not be ignorant how far food, previously taken in, may either prevent or

(*u*) L. cit. 51.

(*x*) Vita cit.

(*y*) Carm. l. 1. Od. 37.

(*z*) L. 6. Epist. 16.

(*a*) De situ Orbis, l. 17.

(*b*) Vita cit.

retard the effects of poison that is swallow'd (*c*) : that, while she was at dinner, the box, full of grapes and figs, was brought in, together with the asp ; as she seems previously to have order'd : and then, finally, that she deliver'd the letters directed to Cæsar, and, all witnesses being remov'd, shut the gate.

You therefore perceive, from this very series of things, whether it is most probable that she kill'd herself by a poisonous ointment, or by an asp.

Add to this, that Epaphroditus, who kept her so cautiously and attentively, as immediately “ to take off the upper garment ” of his prisoner, “ left she “ should have conceal'd any poison underneath ; ” as Plutarch has asserted above ; would certainly not have left her boxes of ointment without a diligent examination and strict enquiry : or, what was much more ready and safe, would have chang'd them for others fill'd with innocent ointments, of whatever price they might be ; since Augustus had given this charge to him, “ That he should, above all things, take care she might not have it in her “ power to kill herself : but as to every thing else, that she should be quite “ at her liberty.”

One thing only, therefore, remains for you to conjecture ; I mean, that there was but a little of that poisonous ointment, so that it could “ be “ hid under the hair in that hollow plate ” which has been spoken of above (*d*).

For thus, also, “ in Martina ; famous for the preparing of poisons ; who “ died of a sudden death at Brundisium,” while she was brought to Rome as an accus'd person (as we read in Tacitus (*e*)) ; “ poison was hid in the “ knot of her hair, nor were any marks of the poison she had taken found “ upon her body.”

Yet if you should make this conjecture, the argument then returns that was brought above (*f*) in opposition to the opinion of those who contended, that the poison wherewith Cleopatra had kill'd herself, by swallowing, was included in that plate.

For as a little ointment was not sufficient to anoint the whole body all over, but only certain parts ; as, for instance, the nostrils, and other similar parts ; to what purpose was it to shut the gates or doors, in the mean time, and to remove all witnesses, in order to do what she might have done in the night, when she appear'd to be asleep : and that without the suspicion of any one ?

And to this we might add a great number of other arguments, which it is not necessary to repeat, and which do not at all agree with the suppos'd ointment ; but agree perfectly well with the bite of the asp ; as the application of the psylli, the two punctures observ'd in the arm, and other things : among which are the very ancient statues and images, whereto some respect must be paid ; and, in particular, that which gave the first occasion to the dispute, in which the asp is tied to the arm, in such a manner as to seem to be irritated and provok'd to bite by the very constriction of the bandage.

(*c*) Vid. *supra*, n. 10.

(*d*) N. 44.

(*e*) *Annal.* l. 3.

(*f*) N. 44.

Nor let it stagger you that it has been objected hereto, that no-body dare tie an asp to the arm of another, lest the asp should bite the person who binds it rather than the other's arm. For what else did those two servant-maids desire, but to die by the same fate as their mistress? following the example of the eunuch their colleague, who, as Dio (*g*) relates, “voluntarily expos'd himself to be bitten by serpents,” as soon as ever the queen was taken prisoner.

And as to the other arguments; taken from the soft and timorous minds of women, or from the supposition of one asp not being sufficient to kill three women by its bite; and any other objections that might be drawn from Redi, or elsewhere; I think I have pretty well overcome them, either in the letters before publish'd, or in the present letter.

46. And thus far I had to add to those same letters: not that you should prefer what I have now written to the things said on the contrary side of the question by that illustrious man, and in an ingenious and learned manner; but that, by comparing both of the disputations together, it might be the more easy for you to distinguish whether I have stood up for that part of the question, in this controversy, which, at least, does not stand greatly wide of probability.

And although this point of itself is not of any great moment; yet, by reason of the several quotations that I have been under a necessity of making on account of it; not only from historical, but from medical authorities, and even from other sources; it has, I hope, lessen'd the irksomeness of long reading to you, to whom it may be, perhaps, in some measure useful: or, at least, it has alleviated to me this last labour of writing; so that I think myself at liberty to conclude my treatise to you on this subject almost in the same words as the author of the book *De Theriaca* (*b*), whom I have often commended, finishes his narration to Piso upon the death of Cleopatra: “I have treated of this subject with a secret pleasure of mind, that I might be able to satisfy that desire which you have after all learning.” Farewel.

(*g*) L. 51. cit.

(*b*) C. 8.

END of the FOURTH BOOK.