

Surgical tracts ... Consisting of I. Outlines of the history of surgery. II. An essay on inflammation and abcess. III. A dissertation on the effects of motion and rest, and their application to the purposes of surgery ... by M. David, with copious ... annotations. IV. Observations on counter-strokes. V. On the methods employed in treating cancerous diseases, including remarks on the cure of indurations of the breast / The whole collected and interspersed with occasional notes and observations by William Houlston.

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SURGICAL TRACTS,

BY THE LATE

J. O. JUSTAMOND, F. R. S.

SURGEON TO THE WESTMINSTER HOSPITAL.

CONSISTING OF

I.

Outlines of the History of Surgery,

From the earliest Antiquity of the Art, pointing out the particular Improvements, and fixing them where due.

II.

An Essay on Inflammation and Abscess,

With their proper Modes of Treatment in different Parts of the Body.

III.

A Dissertation on the Effects of Motion and Rest,

And their Application to the Purposes of Surgery;

From the French Prize Memoir by M. DAVID, with copious additional Annotations on the Original Text.

IV.

Observations on Counter-strokes,

And an Account of their various Consequences, Treatment, &c.—from the same.

V.

On the Methods employed in treating Cancerous Diseases,

Including Remarks on the Cure of Indurations of the Breast.

THE WHOLE COLLECTED AND INTERSPERSED WITH OCCASIONAL
NOTES AND OBSERVATIONS

By WILLIAM HOULSTON,

MEMBER OF THE CORPORATION OF SURGEONS, FELLOW OF THE SOCIETY OF
ANTIQUARIES, AND OF THE MEDICAL SOCIETY OF LONDON.

L O N D O N:

Printed for T. CADELL, in the Strand.

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SURGICAL TRACTS

BY THE LATE

J. O. LUTAMOUN, M.D.

LECTURER TO THE MEDICAL SCHOOL

OF THE UNIVERSITY OF

CHICAGO, ILL.

CHICAGO: PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS

1891

WITH 100 ILLUSTRATIONS



TO

Mr. HENRY WATSON, F. R. S.

SENIOR SURGEON

TO THE

WESTMINSTER HOSPITAL,

AND TO THE REST OF THE

MEDICAL FACULTY

OF THAT

EXCELLENT INSTITUTION,

THE FOLLOWING SHEETS ARE MOST RESPECTFULLY DEDICATED

BY THEIR FAITHFUL AND OBLIGED

HUMBLE SERVANT,

THE EDITOR.

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EDITOR'S PREFACE.

THE work now submitted to the reader's attention, is by no means offered, as either an extremely correct or an highly valuable performance. It is not the character of posthumous works to be unexceptionable in these respects, since they most commonly consist of materials on which their author only fixed a secondary value, and thought just good enough not to destroy, yet of insufficient merit for publication. To this disadvantage may be added, the want of that improvement which the author's hand might have afforded to the manuscript, in its progress through the press; (supposing he had been induced, by particular circumstances, to agree to its public appearance) a deficiency, which no collateral assistance whatever can fully supply.

But the principal motives for the present undertaking are not unknown to the generality of readers. They are indeed well understood, by those humane and respectable persons,
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who, equally disposed to lament the occasion, and to admire the chirurgical abilities of the deceased author, have liberally encouraged and generously supported the design.

The history of surgery will be found to afford less novelty in the matter, than in the arrangement of it. In chronological points, the author will appear to have so far differed from FREIND, and other writers, as to justify the design of the whole performance, which is likewise meant to separate the historical occurrences of Surgery from those which relate to the medical art at large; a view in which, hitherto, the subject has been uniformly treated, but which, in proportion as it is advanced towards the present period, must have become the more obviously improper. It may be likewise remarked, that the author, in carrying this history to his own time, has included many eminent surgeons, to whose extraordinary talents this necessary tribute had not before been paid*.

* We should here regret, that in the number of those whose eminence as practitioners, and whose zeal and ability in the improvement of our art, have rendered them the proper objects of public regard and veneration; the particulars of the life of that great and distinguished surgeon, Mr. POTT, are not included. This however will not be difficult to account for, and in a way that does the author no discredit. The manuscript which supplied the History of Surgery, was used by the author as notes, for a discourse, introductory to a series of Lectures on the Practice of Surgery, which he publicly delivered in London; and, thus circumstanced, he thought it highly proper to avoid animadverting on the professional abilities and conduct of any living character; a motive not unworthy our commendation, and obviously necessary in a public lecturer. The medical world, however, will shortly be gratified, with an account of this very distinguished Practitioner, affixed to a complete edition of his works, from the pen of Mr. EARLE.

An

An account of the several qualifications requisite to form a good surgeon, annexed to this part of the work, and of obvious utility to the junior part of the profession, will not, it is presumed, be found undeserving of the place assigned it. More indeed might have been said on a subject which involves the general reputation of Physic, and from the due observance of which, we can alone expect to rescue our profession from the imputations of the malevolent and illiberal.

The general plan of treating inflammation and abscesses laid down in the succeeding treatise, though in many respects no more than a description of what is adopted by practitioners at present, exhibits many marks of sound judgement and ability in the writer. We may consider among the best of his observations, his account of the whitloe and its several distinctions, together with the reasons on which the particular treatment recommended is grounded. In those parts of his subject where the reader will find occasion to consider the author as having been somewhat too concise, as in speaking of the causes and treatment of abscesses of the joints, of the viscera, of the abdomen, &c., there appears to be reason for an apology. Yet, it is hoped, the subject, so far as it extends, will be found not unworthy of the author, nor wholly wanting in utility to the practitioner. The observations on tumours, may also be thought incomplete in many respects; but these being superadded, and capable of being wholly left out without breaking in upon the subject professed to be considered by the author, will probably be entitled to indulgence.

The succeeding Essays, on Motion and Rest, and on Counter-strokes, productions of a very able and experienced French surgeon, seem deservedly to have employed the author's known abilities in translation. Works so equally to be admired, for ingenuity of argument and abundance of facts, cannot be too generally circulated or universally read. The additional notes to the former of these dissertations will probably be deemed no immaterial appendage, since many of the points they are designed to illustrate, are of no little moment. Had not that event, which interferes with all human intentions, prevented, similar annotations and remarks, the fruit of long experience and an extensive knowledge of the subject in the deceased translator, would have been affixed to the Essay on Counter-strokes. But this deficiency can only be regretted, without the possibility of being remedied.

The concluding treatise, on the trial of certain remedies for the cure of Cancers, &c., is merely a new edition of a pamphlet already in print, entitled, "*An account of the methods pursued in the Treatment of Cancerous and Schirrous Disorders, and other Indurations.*" It was thought advisable to include this in the present work, not less on account of its former favourable reception in public, than because it nearly compleats the chirurgical works of Mr. Justamond*.

CHANCERY LANE,
OCTOBER 2, 1789.

* There are indeed some other small publications on subjects of surgery by Mr. Justamond, but these are purely controversial, and of a temporary nature.

I.

O U T L I N E S

OF THE

H I S T O R Y O F S U R G E R Y.

O U T L I N E S

O F T H E

H I S T O R Y

O F

S U R G E R Y.

TO those who would be well versed in the principles of **SURGERY**, it cannot be a disagreeable task, to trace the origin and progress of it from the earliest accounts down to the present period; especially as the first necessary step in the pursuit of any science, is to become acquainted with all that has already been made known upon the subject. It is therefore the object of the present undertaking to exhibit a general sketch of the History of Surgery, and point out in a cursory manner the principal persons who have adorned this noble art, with their practice and writings.

The most ancient division of medicine was into Chirurgery, Diet, and Pharmacy; the former of these teaches us to cure by the assistance of our hands, and by various external applications, many disorders to which the human frame is incident, and which are not within the power of the other two branches.

In the primary ages of mankind, when the most perfect of all created beings had yet scarce degenerated from that state of perfection in which he first was produced from the hands of the Creator, disease was yet unknown upon the earth. Man had then no wants but such as the neighbouring stream or the labour of his own hands would supply, no cares but those of a domestic nature, amply compensated by the satisfaction which attends them. His mind was not yet weakened by intemperance nor his body impaired by debauchery—exercise was his only physic, and unbroken, undisturbed rest his only restorer. But even in those happy and tranquil times, man was not exempt from the consequences of accidental violence. His body was not less exposed to common casualties and to a variety of strokes that might bruise or wound his flesh, or dislocate or fracture his bones. He might be torn by the fangs of some wild beast, or affected by the bite of some venomous insect. Such were the first and most natural evils to which man in the place assigned him in the order of created beings must have been obnoxious, and therefore his thoughts would necessarily be engaged in finding out some means of relief for these accidents. Thus from the nature of the subject, as well as from the testimony of CELSUS and many other remote authors, it appears that Surgery was incontestably the most ancient branch of medicine, the parent of all the rest.

We learn, however, from the earliest accounts that have been transmitted to us, that the two professions of Physic and Surgery were by no means distinct from each other, but that, on the contrary, the professors of one, were equally practitioners of the other. It will be impossible therefore, in speaking of the History of Surgery, to separate it entirely from that of Physic; but this connection will only regard the professors of the art, for we shall avoid taking notice of any of their discoveries or improvements in Medicine, unless they are immediately connected with Surgery. For the sake of clearness and precision it may be right to premise, that this history will be distinguished by two periods: The first will comprehend from the beginning of the world to the coming of CHRIST, a space generally reckoned of about four thousand years. The computation
of

the second period, reckoning the centuries in the usual manner, will begin from the Christian æra. By way of illustrating this, let us suppose that mention is to be made of those writers who lived in the space of time between the years 1300, and 1400. These may be said to have flourished in the fourteenth century. Thus whenever one century is completed the next begins; so that according to this method of reckoning we are at present beyond the middle of the eighteenth century. It seems necessary to be somewhat particular in explaining this circumstance, as some writers, and especially GOELICKE, who professedly wrote a History of Surgery, has mistaken this point, reckoning the centuries in an erroneous manner. GOELICKE, though his book was published in 1713, says he writes in the seventeenth century. This has made him very inconsistent with FREIND, and other writers; for though he agrees with them as to the period of time in which the several authors lived, yet if we judge by his method of reckoning the centuries, we shall find them placed one century later than they are by other writers. A slight degree of attention to this circumstance will indeed reconcile many doubts, and clear up several difficulties which otherwise occur in the relations of writers on the History of the Medical Art.

It was in EGYPT, that grand nursery of all the arts and sciences, that Surgery is said to have received its first cultivation. PROSPER ALPINUS, professor of Physic at Padua, in the seventeenth century, published a work treating professedly *De Medicina Ægyptiorum*, and in it are included many things relating to Surgery. Among others, a very singular method of extracting the stone from the bladder—It was done by insinuating a canula of a certain length into the urethra, through which that and the bladder were inflated to as great a size as they could bear. The urethra being well distended, a finger was next introduced into the anus, and the stone pushed towards the neck of the bladder. The canula was then removed suddenly and with great force, and by this singular management, several stones were said to be extracted. ALPINUS was a writer of some credit: he had left his own country, inspired with a laudable thirst of medical knowledge, and had travelled into Egypt, where

he resided several years, and conversed familiarly with the physicians there, in order to acquire an insight into their practice, and he affirms to have seen the above operation practised with success. Mr. CHESELDEN, however, very judiciously observes in his treatise on the high operation, that it is not probable this method could have been used with effect, where the stone was of any size, and that it could only have been practised where a number of little stones, or perhaps gravel, was in the bladder. And indeed the instance ALPINUS produces seems to confirm this opinion, as it mentions that he saw an operator whose name was HALY, extract several stones from a certain general of the Turks, by this process. Bleeding in the veins, as well as in the arteries is likewise said to have been in use with them. Actual cautery was frequent; and ALPINUS also mentions their performing the paracentesis of the abdomen in a dropsy. These observations however seem rather to respect the modern practices of the Egyptians; for the first instance we have upon record of the performance of the operation of bleeding occurs among the Greeks, as we shall see hereafter.

From the most ancient historians, we collect that the Egyptians attributed the invention of physic to HERMES, or MERCURY, who afterwards taught it to ÆSCULAPIUS, his nephew. They also included OSIRIS, APIS, or SERAPIS, and ISIS, (who were afterwards classed with their divinities) among the first practitioners of medicine; who, from the respect they were held in, on account of the wonders of their art, which was supposed to proceed from the gods, were all of them deified by the Greeks, as well as by the Egyptians. This ÆSCULAPIUS of Egypt was different from the Grecian ÆSCULAPIUS, or rather perhaps there never was but one person of that name, and the Greeks may have given it to the first physician among them, in order that posterity might imagine him to have been a native of Greece, and that the honor of the first invention of the science might by that means be transferred from Egypt to their own country; an honor which the Greeks were very jealous of arrogating to themselves, and which may be the reason, why we find that the technical terms of almost all arts and sciences even at this day, are com-
pounded

pounded of words derived from their language. The Egyptian *ÆSCULAPIUS*, and the other first inventors of medicine, are supposed to have lived about the time of the deluge, which is said to have happened near the middle of the seventeenth century from the creation of the world. From Egypt, however, Phyfic and Surgery travelled with the other arts and sciences into Greece. *CHIRON* of Theffalia, the Centaur, as he is called, who is reputed to have been inventor of the healing art, lived about the time of the Argonautic expedition. He is said to have been well skilled in the knowledge of plants, particularly such as were proper for wounds, and inveterate ulcers, which are said to have been called *Chironian* ulcers from him. The Grecian *ÆSCULAPIUS* was one of *CHIRON*'s disciples, and of him it is reported by his countrymen that he was present at the Argonautic expedition which took place about 1100 years after the deluge.

From all we can learn concerning this *ÆSCULAPIUS*, it is most probable that his knowlege consisted chiefly in Surgery, as we have given our reasons for supposing that the most ancient branch of medicine*; and indeed the most considerable of his cures upon record, and that which gained him the reputation of bringing the dead to life, was of a surgical nature, since it was performed upon *HIPPOLYTUS*, whose limbs had been torn, and broken to pieces by horses.

From this short account we may observe that the History of Surgery in these early periods is so uncertain, and so blended with the fabulous system of pagan mythology, that we can have very little dependance upon its truth and authenticity.

MACHAON, and *PODALIRIUS*, two sons of *ÆSCULAPIUS*, according to the testimony of *HOMER*, were in the Grecian army at the Trojan war. The accounts we have of them relate entirely to surgery, as they are said to have assisted those who were wounded in battle. *MACHAON* was killed at the siege of *Troy*: *PODALIRIUS* returning from that siege, was

* *CELSUS* and *PLINY* were both of this opinion.

cast by a storm upon the coast of Caria, where being introduced to King DAMÆTUS, whose daughter had fallen from the top of a house, he bled her in both arms, after which she recovered. This is the first instance of bleeding, as before alluded to, and the anecdote is recorded by STEPHANUS BYZANTINUS in his geographical lexicon under the word *styrma*.

Most of the ancient heroes indeed are supposed to have understood the art of Surgery; for, being much engaged in war they, would naturally be induced to endeavour to repair the injuries they were exposed to. ACHILLES is said to have found out the use of verdigrease, and is on that account painted scraping the verdigrease from the point of his lance, upon the wound of TELEPHUS; and EURIPILES being wounded, is represented by HOMER as desiring PATROCLUS, the friend of ACHILLES, to prevail upon him to communicate some of the excellent remedies that hero had learnt from CHIRON.

From the end of the Trojan to the beginning of the Peloponnesian war, a space of about eight hundred years, there is a great vacuity in the History of Medicine; yet in this interval lived many philosophers, among whom were THALES, EMPEDOCLES, PYTHAGORAS, HERACLITUS and DEMOCRITUS. The philosophers of those days were all physicians and surgeons; for the sciences of philosophy and medicine were not then divided or considered as distinct acquisitions. We have no other accounts of their medical knowledge but such as are traditional, or transmitted to us in the writings of HIPPOCRATES, CELSUS, and others. About the end of the *thirty-fifth century*, near thirty years before the breaking out of the Peloponnesian war, HIPPOCRATES was born in the island of Cos: he was a descendant of the *Asclepiadean* family, according to his own account. Medicine and Philosophy were first distinguished, and treated of as separate sciences, by this accurate writer. He is the most ancient physician of any whose writings have been transmitted to us; and there can be no doubt of his having been a skilful practitioner * in surgery.

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* From the internal evidence exhibited in his Aphorisms, it is to be presumed that HIPPOCRATES derived almost all his medical knowledge from his own observation and practice.

One of his Aphorisms points out the particular use and end of this art. It says that disorders which medicine will not cure must be referred to the knife; if the knife is unsuccessful, cautery must be applied; and if cautery fails, they are to be deemed incurable. His chirurgical writings are particularly, one book upon wounds, another upon ulcers, a third on fistulas, a fourth on fractures, and a fifth on the articulations, in which the doctrine of dislocations is included. Most of his Aphorisms may be considered as so many axioms in physic or surgery, which have stood uncontroverted to this day. There are several surgical remarks, among them; I shall quote one which may serve to prove that he was as accurate an observer in surgery as he was in physic. It establishes a rule, admitted ever since, by which we may judge whether pus is already collected in any part of the body where we have reason to suspect its existence. The words of the Aphorism literally translated are, that while the generation of pus is going on, pain and fever are more violent than after it is formed. This rule strictly attended to, may be of great service in indicating the proper time for the opening of abscesses, especially such as are deep seated, and where we wish to let out the matter as soon as we can be assured from any signs that it is actually collected. In general the operations practised by HIPPOCRATES consisted in the opening of abscesses, the paracentesis of the thorax as well as that of the abdomen, the trepan, and scarifications. He has many excellent remarks on ulcers and wounds, and particularly some observations on the latter very useful in instructing young Surgeons to be cautious in their treatment and prognostics of all wounds, particularly of the head, however small or inconsiderable they may appear.

This great master of the art, for reasons known only to himself, did not chuse to perform the operation of lithotomy, though it appears to have been generally practised in his time. It is evident indeed from his writings that even in those days it was an operation consigned to a distinct

practice. There are no traits of a compiler, and if any medical writings existed before his in Greece, he appears to have made no use of them farther than was confirmed by his own experience. These circumstances, if true, render the writings of HIPPOCRATES invaluable. G.

OUTLINES OF THE

set of people ; for in the oath which he required his pupils to take, he makes them swear that they shall not cut for the stone, but leave that operation to persons who made it their particular study and business.

I cannot dismiss the account of this divine old man, as he is often styled, without speaking of the *actual cautery*, an operation so much used by him, that there is scarcely any chronic disorder in which he has not recommended it. One circumstance in which he used it, is very singular ; in his book *De affectionibus*, we learn, that in the beginning of an ascites he cauterized the belly in eight places, near the region of the liver.

When I consider how much this practice has been advised by all the most learned and judicious of the ancients, I cannot help thinking that from the frequent and numerous applications of it upon the same patient, in many obstinate chronic cases, they must have experienced advantages unknown to the moderns. Perhaps therefore we have little reason to pride ourselves upon the entire abolition of this reputed barbarous custom. Neither does it appear to have been attended with so much pain as we are apt to imagine. M. POUTEAU, an ingenious Surgeon of Lyons, in his surgical essays, has revived the use of it in some cases with good success ; and from the instances he produces, we may conclude that the pain attending the operation is very supportable. So zealous was he indeed for the improvement of the art, that he has frequently tried the application of it upon himself ; and after his death his body is said to have been found covered with various scars, as glorious sure to a man in the acquisition of science, as those which others can boast of in the pursuit of military fame. If, however, it is even probable that cures, which have baffled all other means, may be effected by this, I think it deserves at least our serious consideration.

In the interval of time between HIPPOCRATES and CELSUS, many Professors of Surgery appeared, as we find by the testimony of CELSUS and GALEN, as well as of several historians. Though scarcely any of their works are handed down to us, yet, I shall take notice of some of them

them, and relate some anecdotes upon record, both to give an idea of the persons who professed the art, and of the state of Surgery in those ancient times.

About thirty-three years after HIPPOCRATES, lived CTESIAS, who was also of the same family. He is said to have been taken prisoner in a battle between CYRUS the younger and his brother ARTAXERXES MNEMON, in the year 401 before Christ. He cured CYRUS of a wound he had received in the fight, and afterwards remained with that monarch, and continued exercising his art for seventeen years.

DIONYSIUS the tyrant of Syracuse, as we are told by ÆLIAN, also understood Surgery, and performed divers operations himself.

CRITOBULUS lived much at the same time as DIONYSIUS. He was attached to the court of PHILIP King of Macedon, and extracted very happily from that monarch's eye, an arrow with which he had been wounded. He conducted the cure so well that PHILIP was not disfigured by the accident.

DIOCLES of Carystia was the first who enjoyed any considerable degree of reputation after HIPPOCRATES. The Athenians used to call him the *second Hippocrates*, and according to GALEN, he made considerable progress in the healing art. He flourished 130 years after HIPPOCRATES; about 380 years before the Messiah, under the reign of ANTIGONUS, King of Asia.

His practice was nearly the same as that of HIPPOCRATES. He invented an instrument for extracting the point of an arrow when left sticking in a wound. This instrument was still called *Diocles*, in the time of CELSUS. He also invented some bandages for the head, which we are told by GALEN in his book *de fasciis*, likewise bore his name.

PRAXAGORAS was the first in reputation after HIPPOCRATES, and DIOCLES. He was also born in the island of Cos, and was the last of the *Asclepiadean* race. He was a famous practitioner in Surgery. In the disease which he called the *Ileus*, if the symptoms did not remit after the patient had been made to swallow a leaden bullet, as practiced by HIPPOCRATES, he boldly made an incision into the cavity of the belly, to extract the fæces, and afterwards sewed up the intestine.

About this period, that is to say in the time of ERASISTRATUS and HEROPHILUS, as we are informed by CELSUS, Medicine was divided into three branches, the *Dietetic*, which was the province of the physician, the *Pharmaceutic*, and the *Surgical*.

ERASISTRATUS was born at Julis, in the island of Ceos, or Cea, and not at Cos, as some have imagined. He lived near the end of the *thirty-seventh century* of the creation of the world. The only fragments of his works are found in GALEN; whence it appears, that he was adventurous in surgical operations. In a schirrus of the liver, or in tumours of that viscus, he used to make an incision into the cavity, and apply his remedies to the viscus itself*.

HEROPHILUS was born at Carthage. According to GALEN, he lived about the beginning of the *thirty-eighth century*, under the reign of PTOLOMY SOTER. SEXTUS EMPIRICUS relates of him, that being called to reduce the dislocated shoulder of the philosopher DIODORUS, who asserted that there was no such thing as motion, and pretended to prove it by a sophism, HEROPHILUS argued with him thus: “The bone of your
“ arm has moved either in the place, where it was, or in the place where

* Is it not more probable that the incision in these cases was made into the diseased part, only after such adhesion had taken place as to preclude all communication with the cavity of the abdomen? To cases of this kind the moderns are no strangers. H.

“ it was not ; now according to your principles, it cannot have moved
 “ either in one or the other of these places, therefore it has not moved
 “ at all.” DIODORUS, perceiving that HEROPHILUS was merry at his
 expence, begged of him to quit his logic and sophistry, and make haste
 to relieve him. This is an anecdote which proves beyond a doubt that
 HEROPHILUS practiced Surgery.

About this time, AMMONIUS, a famous Surgeon, flourished at Alexan-
 dria. He was surnamed LITHOTOMUS, because he was the first who ven-
 tured to cut, or break in the bladder, such stones as were too large to be
 extracted without danger.

In the *thirty-seventh century*, ASCLEPIADES was born at Prufus, a city of
 Bythinia, under the reigns of ATTALUS and EUMENES, Kings of
 Pergamus.

He practiced Surgery, as appears from his writings, which abound in
 remarks upon topical applications. In a quinsy, he opened the veins of
 the arms, of the tongue, of the forehead, or even of the angles of the eyes,
 and also cupped and scarified, as we learn from PLUTARCH. He also per-
 formed Trachæotomy, and used the Paracentesis of the abdomen in an
 Ascites, but directed that the opening should be made exceedingly small.
 His practice may be known more fully by consulting CELSUS, and
 COELIUS AURELIANUS. The fragments that remain of this writer, are
 to be found in ÆTIUS AMYDENUS.

CASSIUS was contemporary with the first scholars of ASCLEPIADES.
 The works which are extant of his, bespeak him well versed in anatomy.
 There is, however, but one that particularly relates to Surgery, entitled
De Animalibus Quæstiones medicinales.

Several of these questions are chirurgical. I shall produce two of them,
 with his answers, which will serve to shew as much the author's ingenuity,
 as

as his anatomical knowledge, and are such as one would scarcely expect to meet with at so early a period.

One of these questions is, why circular ulcers are more difficult of healing, than others. CASSIUS, after having related and refuted the opinion of ASCLEPIADES upon this subject, proposes his own thus: the cicatrix of round ulcers is long in forming, because in these the sound parts are all equally distant from each other, and on this account have more difficulty in coming together; whereas, in ulcers which have angles, the sound parts, and the skin by which the cicatrix must begin, being nearer to each other (especially towards the extremity of the angles,) the cicatrix is therefore more easily formed, and the edges of the ulcer which are most contiguous join with greater facility.

The other question that remains to be mentioned, is, how does it happen that in wounds of the head, when the meninges of the brain are injured on the right side, the left side becomes paralytic, and vice versa?

CASSIUS answers, that the reason of this is, because the nerves whose origin is in the basis of the brain, decussate, or cross each other, so that those which arise from the right side of this basis pass to the left, and those which spring from the left, go to the opposite side.

ARETÆUS was a native of Cappadocia, from whence he was surnamed CAPPADOX, by way of distinguishing him from another ARETÆUS who was of Corinth: He lived in the time of STRABO, and GREGORY NAZIANZEN, and under the empire of AUGUSTUS CÆSAR*.

He was a man of great celebrity in his days, and is as much esteemed for the elegance and precision of his style, as for the soundness of his judgment.

* In this chronological point the author has followed M. le CLERC; but Dr. FREIND asserts, and apparently on good grounds, that it is a palpable mistake—See *History of Physic*, Vol. I. page 6. H.

He was the first who introduced the use of blistering with cantharides; and practiced bleeding nearly as HIPPOCRATES did. In violent pains of the head, he opened the veins of the forehead, and sometimes drew blood from the vessels in the inside of the nose. For this purpose he used certain instruments, one of which he called *Cateiadion*, and the other *Storyma*. When these were not at hand, he used a goose quill, the end of which he cut into the form of the teeth of a saw. This he introduced into the nose, near the *ethmoid* bone, and by moving the quill about with his two hands, he made the blood flow.

As ARETÆUS lived in the beginning of the *fortieth century* of the world, which is the date of the birth of CHRIST, the second part of this history, computing from the Christian Æra, necessarily begins with him.

The precise time in which CORNELIUS CELSUS flourished is not absolutely ascertained. It is most probable, however, that he was born in the reign of AUGUSTUS, and wrote in that of TIBERIUS CÆSAR. He is particularly remarkable for the elegance of his style; and indeed we need not be surprised at this, since he lived at a time when the Latin language was just brought to its highest degree of perfection.

His seventh and eighth books treat wholly of chirurgical matters. It appears that he confined the practice of Surgery to those cases where the Surgeon himself made the wound, not where he found it ready made, so that all ulcers and other complaints not requiring manual operation he referred to the Physician. He seems to have added very little, on this subject, to what is found in HIPPOCRATES, from whom he copies many sentences verbatim. The chief improvements we find in him, are a chapter on the operation called *Gastroraphy*, or the future of the belly; to which that of the intestine, or *Εντεροραφη*, is added.

He is the first writer who advises perforating the bones with several small holes in cases of caries, a practice mentioned also by BELLOST.

His description of Gastroraphy is accurate, and the directions for performing it nearly the same as the rules laid down by the best modern writers.

CELSUS is also the first who notices that the vessels of the brain may be ruptured, without the cranium being fractured. For the *fistula in ano*, he mentions the same method of cure as that which has been lately proposed by M. FOUBERT, and is now very commonly practiced in France; except that CELSUS advises a linen thread, instead of a leaden stillet, which is used by the moderns. This method consists in passing a thread or piece of lead into the external opening, up the *sinus*, then bringing it out by the *rectum*, and afterwards drawing it tighter every day by degrees, till the whole of the *fistulous sinus* is cut through. This method of cure may certainly be used with advantage in a simple state of the disorder, and with persons too timorous to submit to the knife*. He also describes the operation of lithotomy, after that manner which is now called *Apparatus minor*, or cutting upon the gripe; however Mr. HEISTER is very much mistaken, when he observes that CHESSELDEN, and MORAND's method of cutting, are no more than an improvement of this author. CELSUS directs that the operation should not be performed on children under nine, or above fourteen years old. He writes, though very unintelligibly, upon the radical cure of the *hydrocele of the tunica vaginalis*, by the excision of the *cyst*, and gives a very confused account of the operation for the *bubonocoele*.

It will be as well if we pass over the time between CELSUS and GALEN, a space of about one hundred and fifty years, because it is a period in which we meet with nothing interesting enough to deserve repetition.

* This method is at present practiced, and has even been strongly recommended by PROFESSOR CAMPER, who it seems has constantly employed it in the cure of persons whose situation in life would not allow of leisure to be cured by cutting; but by his own confession very great and uniform inconvenience attends this mode, arising from the constant irritation to which the intestine is exposed from the ligature, and by which, in most instances, a very painful prolapsus is occasioned. H.

CLAUDIUS

CLAUDIUS GALEN of Pergamus, a city of Asia, famous in many respects, and particularly for its having a temple dedicated to *ÆSCULAPIUS*, was born near the middle of the *second century* after CHRIST, under the reign of the Emperor ADRIAN, and flourished under the Emperors ANTONINUS, MARCUS AURELIUS, COMMODUS, and SEVERUS. He was a very laborious man, and the most accurate anatomist that had yet appeared in the profession. He certainly practiced Surgery himself, and understood it as well as Physic, for he had acquired great skill in wounds of the nerves, and had a method of treating them unknown before. He tried it with success upon some Gladiators which the High Priest of Pergamus had committed to his care.

He established two general operations of Surgery, which he considered as the basis of this art, namely, *reunion*, otherwise called *synthesis*, and division, called *diarefis*.

In violent blows, or fractures of the *cranium*, he advises the trepan; and though he confesses he never performed it himself, yet he thinks it useful, provided the Surgeon takes care not to touch the *dura mater*, which he thinks might destroy the patient. I cannot avoid mentioning that this caution is totally inconsistent with an observation we find in his book, *De usu partium*, which speaks of a wound of the brain that had penetrated as far as the ventricle, with loss of substance, which however the patient survived.

In his treatise on luxations, and fractures, we find many excellent precepts, which some of the moderns have shamefully pillaged, without ascribing the honour of them to him.

In violent head aches he applied leeches, and used cupping, and scarifications; surgical helps, which notwithstanding the testimony of this great man, are still too much neglected, to the prejudice of the art. It must be owned however, that his chirurgical works are chiefly explanations of, and commentaries on, those of HIPPOCRATES.

In

In the *fourth century* lived a Physician of great erudition, and amiable manners, named ORIBASIUS. He has been considered by many as a mere compiler; and M. le CLERC thinks that what he has left us upon Surgery, is entirely copied from GALEN, and ÆTIUS. In this particular he certainly is mistaken; for though the assertion may be true in some respects, yet it is far from being so entirely. ÆTIUS indeed, according to Dr. FREIND, was posterior to ORIBASIUS, and therefore the latter could not have copied from him.

He is very full upon the advantages of scarifications in many disorders, and says he has practiced them with great success in suppressions of the menses, inflammation of the eyes, and difficulty of breathing. The scarifications used by ORIBASIUS were different from those practiced in cupping. The latter were only in use among the Arabian Physicians, whereas it appears from several passages in GALEN, that the ancients practiced only the former. These scarifications consisted in making deep incisions in the skin. The Egyptians, as we have before observed from PROSPER ALPINUS, use them to this day. They were performed in the following manner. A ligature was first placed below the ham, and pulled to a certain tightness. This being done, the leg was then rubbed, and immersed in warm water. When it had remained there for some time, it was taken out, to be beaten with a stick till it swelled; and in this state the scarifications were made.

The seventh book of ORIBASIUS's collection is entirely on Surgical matters; namely, bleeding, cupping, the application of leeches, and escharotics. He has also given an ample description of several instruments of Surgery, and in particular of a machine for reducing luxations, which continued in use a long time. We are indebted to him for throwing much light upon different points of Anatomy and Surgery in GALEN, which without his explanation, would have been unintelligible.

Towards the end of the *fifth century*, and the beginning of the sixth, lived ÆTIUS, of Amida, in Mesopotamia. His works abound in useful
observations

observations relative to Surgery, which, however, are not ranged under distinct heads, but thinly scattered among a variety of other matter: the reader will not find his time mis-spent in picking them out. His method of treating the Anasarca is laid down with so much propriety, that it is a matter of surprise the practice has not been invariably followed ever since. It directs us to make an incision on the internal part of the leg, at the distance of four fingers breadth from the ankle, nearly in the place where bleeding is now usually performed in the foot. This opening, he says, is not attended with any inflammation; it is a sort of spout through which nature discharges herself; and he has known the disorder cured by this method, without the use of internal medicines. He recommends both actual and potential cautery, and in paralytic complaints he applied them to the nape of the neck, and top of the head, and proportioned their number to the violence of the affection.

He considered the cautery as the only relief one could expect in an inveterate asthma. In this case he applied many; one on the articulation of the clavicle with the sternum; two in the course of the carotid artery near the lower jaw; two under the breasts between the third and fourth ribs; two more on the back, in the space between the fifth and sixth ribs; one upon the xiphoid cartilage; two between the eighth and ninth ribs on each side; and three more in the back; one in the middle of the spinal column, the other two a little below the former, and upon the spinal processes of the vertebræ.

In an excellent treatise he has left us on the bite of mad animals he recommends keeping the wound open * for sixty days. The use of Setons was also known to him, a circumstance worthy to be mentioned, because the knowledge of them has been fixed by others posterior to his time.

* A mode of treatment thought *so likely to be useful*, that all succeeding practitioners have imitated it even to the present day, but which has not a single fact to establish its propriety. The intention of affording the Virus which has been left in the wound a ready outlet, and thereby rendering its absorption less probable, is good. But this salutary effect can scarcely be expected from any of the common modes of keeping a wound open in opposition to the efforts of nature, or from the use of irritating applications, which we see, in common cases, rather tend to bring the absorbents of the part into action. H.

LEONIDAS practiced Surgery at Alexandria, about the end of the fourth, and the beginning of the fifth century.

He affirms, that by scarifications in the legs, arms, thighs, and scrotum, of persons afflicted with the anasarca, he has evacuated not only the water in the cellular membrane, but that contained in the cavity of the belly also; and in the *Empyema* he recommends the thorax to be opened by actual cautery.

He is the first who mentions those worms which, forming under the skin, sometimes occasion suppuration, and are to be extracted by rolling them gradually round a stick; in doing which, great care must be taken not to break them.

This worm is very frequent on the Coast of Guinea, along the Persian Gulph, and in Tartary. KEMPFER also in his *Amœnitates exoticæ*, observes, that this disease is most prevalent in hot countries, and describes particularly the method of extracting these worms—There are only fragments of this author extant, and these are to be found in the works of ÆTIUS.

PROCOPIUS, who lived in the *sixth century*, under the reign of JUSTINIAN, was a Physician and Surgeon, as well as an Historian. It is from the accounts we meet with in his History of the Wars of the Romans with different nations, that we collect the knowledge he had in Surgery. Speaking of the wound which destroyed ARTABASES, King of Persia, he declares, in express terms, that the carotid artery was wounded, and that the hemorrhage could not be stopped.

The Emperor TRAJAN being wounded above the right eye, the end of the arrow was entirely buried in the parts without giving any pain. PROCOPIUS acknowledges ingenuously that he knew not what course the instrument had taken; but acquaints us that it came out five years after, and that the Emperor was perfectly cured.

This

This writer also gives a very circumstantial account of a wound in the face, which a King of the Goths received from an arrow. The Surgeons were not determined upon the plan they had to pursue. The apprehension of affecting the patient's eye, of irritating the parts by an operation, and thereby increasing the disease, prevented them from extracting the end of the arrow remaining in the wound. One of the Surgeons, however, bolder than the rest, having undertaken to do it, made a pressure upon the King's eye, who cried out violently, and complained of acute pain. The Surgeon, from this circumstance, foretold the cure, and accordingly making an incision through the skin and muscles, he extracted the foreign body; after which the wound healed speedily, and without accident.

But the most remarkable writer in our profession after GALEN, was PAULUS ÆGINETA. Authors differ much about the time in which he lived. We shall however place him, with Dr. FREIND, in the *seventh century*. Though he was a great compiler, yet in several particulars, especially such as belong to Surgery, it appears that he was an original writer. Many people have spoken of him with contempt; but it is evident, from the manner in which he writes upon the operations, that he must have performed them himself.

His works abound in Surgical improvements, and every circumstance in them relative to this art, is in general treated with more copiousness and precision than we find in CELSUS, GALEN, or any preceding writers, so that he is very injudiciously stiled *Simia Galeni*. In short, PAULUS ÆGINETA is one of those unfortunate persons to whom posterity has by no means done the justice he deserved.

Be this as it may, however, his treatise deserves to be looked upon as the most complete body of Surgery published before the restoration of learning. He is much more full and accurate than CELSUS upon several articles; and with regard to lithotomy in particular, he does not forbid the practice of it in a more advanced age than the former allowed of.

He recommended also that the incision should not be made in the middle of the *Perinæum*, but rather obliquely on the left side, which is near the place where we now begin our incision in the lateral method. The fracture of the *Patella* is first mentioned by him ; though he speaks of it as happening but seldom.

He is much more circumstantial than *CELSUS* in describing the several sorts of *Herniæ*, and much more accurate and clear in the detail of the operation. His account of Aneurisms is new and interesting, and his method of performing the operation the same as the moderns. His method of treating wounds and abscesses, is more simple and rational than any yet given. He proscribed that multitude of plasters that obstruct the operations of nature, by whose power alone he was sensible that suppuration and the healing of wounds was effected. He advises the opening of the jugulars and the arteries behind the ears, against the opinion of *CELSUS* ; and is also the first who speaks of extirpating cancerous *Mammæ*. From these various improvements in the art, it is evident that this excellent author deserves more attention than has hitherto been paid to him.

The last thing I shall observe of him, is, that he recommends Bronchotomy, or the opening of the Trachea, in a violent Quinsy. He is the first writer in whom we meet with a description of this operation, which I fear has been too much neglected by his successors. He has judiciously remarked after *ANTYLLUS*, as he declares that this operation is useless in the Quinsy which affects the muscles of the Larynx, the membrane lining the internal surface of the trachea, and even the lungs, and can only be serviceable in the swelling of the tonsils, when the trachea is not injured.

After this time Europe being overrun by the *Saracens*, a barbarous and ignorant people, the whole learned world was thrown into confusion, and Physic and Surgery shared the same fate as the other sciences—But in the *tenth* and *eleventh centuries* the Arabs began, by their assiduity and application, to restore them to their pristine state. About this time flourished

ished MESUE, SERAPION, HALY ABBAS, RHASES, AVICENNA, AVENZOAR, ALBUCASIS, and others.

MESUE is one of the most ancient of the Arabs. There are several surgical disorders treated of in his works, which, though they are published in his name, do not appear to belong to him, since RHASES, who lived a considerable time after, is frequently quoted in them. He proposes a singular method of extracting the polypus that doth not come out of the nose nor appear in the posterior nostrils. It is, to take two or three horse hairs, and twisting them in the manner of a thread, to make two or three knots in them: one of the ends of this thread is then to be introduced into the nostrils by means of a leaden probe, with an eye to it, and is to be brought out by the mouth. This being done, we are to take hold of the two extremities of the thread, and to move them backwards and forwards till the root of the polypus be cut through.

ABUBEKER MAHOMMED, who lived in the tenth and eleventh centuries, and who obtained the name of RHASES, from the town in which he was born, was a physician of much learning and genius. His thirst after knowledge induced him to visit foreign countries, and it is upon this occasion that the following singular story is told of him. As he was passing through one of the streets of Cordova in Spain, he saw a great croud assembled, and stopping to know the cause of it, was told that a man had just expired suddenly. Curiosity prompted him to draw near, and after having examined the body with attention, he ordered a bundle of rods to be brought to him, which he distributed to the bystanders, keeping one for himself. Then desiring them to do as he did, he began to flog the motionless body on all parts, and chiefly on the soles of the feet. This extraordinary proceeding made him at first to be looked upon as a madman; till in the space of a quarter of an hour the dead man began to move, and was soon after perfectly restored to life, amidst the acclamations of the multitude who thought it was a miracle.*

* This fact should be communicated to the society for recovering drowned persons, as it might prove a useful addition to the several ingenious modes devised and taught by them for the restoration of bodies apparently dead.

Though

Though with regard to Surgery RHASES may be considered in many respects as a mere compiler, yet it must be acknowledged that there are many things peculiar to him in this branch; for instance, he is the first writer who has given a description of the *spina ventosa*, which he defines to be a corruption of the bone with swelling, and extension. This definition is very just, for we know that this dreadful disease begins in the cavity of the bone, that the medulla is affected in the first instance, and that the disease is afterwards communicated to the several layers of the bone, which are separated, extended, grow carious, irritate the periosteum that covers them, and occasion great pain. The author distinguishes the *spina ventosa*, from what is commonly called *Pædarthrocase*, though most modern writers have confounded them: the following are the differences he establishes. The *Pædarthrocase* is a kind of tumour which only seizes upon the Epiphyses of the joints, and is almost always unattended with pain. But the *spina ventosa* happens in all parts of the bone, and particularly in the body of it, besides that pain never fails to accompany it. It is a disease most frequent in infancy, though often found in adults.

The *Nodus* differs again, according to RHASES, both from the *spina ventosa* and the *Pædarthrocase*. In the Node, he says, the external layers of the bone are affected, and the tumour is formed without, before the cavity be injured. With regard to the treatment of the Node, RHASES advises, after having opened the tumour, to remove with a cutting instrument, or to destroy by actual cautery, all that part of the bone that is tainted.

AVICENNA was born at *Bochara*, in the province of *Chorassan*, in PERSIA, and lived in the eleventh century. He was a man of genius and early study. Though his Surgery is almost entirely extracted from GALEN, RHASES, and HALY ABBAS, yet he describes some new operations, for instance, the amputation of the Clitoris when too long. This operation, I imagine, should be practiced with as much caution as that of the Penis, though I cannot say I ever met with a case in which it was indispen-

indispensably necessary. The Nymphæ, in Venereal complaints, I have, indeed, seen growing to an enormous size, and though frequently extirpated, frequently rising up again, and filling up the entrance of the Vagina, sometimes with, sometimes without ulceration. This is a complaint which, indeed, in one instance, has baffled all my attempts to relieve.

AVENZOAR lived after AVICENNA, perhaps about the middle of the eleventh century. He is the first writer who has spoken of the *abscess of the mediastinum*. This complaint, says AVENZOAR, manifests itself by a constant and hard cough, followed by a distending kind of pain, which is felt along the forepart of the breast; the breathing is slow, confined, and frequent, an acute fever rages, the patient complains of burning thirst, and his pulse is hard and unequal; shiverings, the usual attendants of all suppurations, also take place in this.

The operation proposed for the relief of this disorder, is trepanning the Sternum; a practice mentioned by Dr. FREIND in his History of Physic, as being, from his own knowledge, frequently successful; and since confirmed by several practical observations in the Memoirs of the Royal Academy of Surgery at Paris. Thus it is that the ideas of great men are never entirely lost. Sooner or later some laborious inquirer, rescues them from the oblivion into which they were fallen, and applies them with judgement.

Dr. FREIND says, that AVENZOAR is the first among the Arabs who mentions the operation of *Bronchotomy in the Quinsy*; but this is a mistake, since we find it previously recommended by AVICENNA. But the chief of the Arabians, particularly in Surgery, is ALBUCASIS, who lived in the eleventh, or perhaps in the twelfth century.

Till the time of ALBUCASIS, Surgery had remained nearly upon the same footing as it was among the later Greeks, that is, as we have described it in speaking of PAULUS ÆGINETA. But ALBUCASIS improved, and brought this art to a much greater degree of perfection. I cannot

help observing, that the actual cautery, so much commended by HIPPOCRATES, still maintained its reputation throughout such a long succession of years, and such varieties of revolutions, as the sciences have experienced. It is recommended by all the Arabs, and ALBUCASIS himself is very lavish in its praises. His Surgery is divided into three books, the first of which is written expressly on cautery.

His second book treats in a very ample manner of all the operations of Surgery made by incision, which he reckons up to the number of ninety-seven. He seems to have copied many things from PAULUS, though he mentions no other writers than HIPPOCRATES and GALEN.

In his eighty-sixth chapter, he relates a remarkable case, which, as it is the first of the kind upon record, deserves to be mentioned. It is of an abscess in the thigh, in which the *Os Femoris* was carious for the length of ten or twelve inches. In the course of the suppuration the whole substance of the bone gradually came away, and its place was supplied by a callous of so hard and firm a nature that the patient was afterwards able to walk very well. I cannot omit taking this opportunity of observing, that if this case had been generally known, or properly attended to, many limbs which have been amputated, might probably have been saved, and the practice of removing carious bones without amputation, would scarcely have been left to adorn the many improvements of the present age.*

Almost all matters relative to Surgery are treated of in this second book of ALBUCASIS, except luxations, which are the subject of the third.

* Our Author seems to have caught his idea of the possibility of a regeneration of bone to the extent mentioned by ALBUCASIS, from the success of this case. The trial made of this at the Westminster Hospital, in which several inches of a diseased Tibia were removed by an operation, is well known, but the event was not so fortunate as was expected, since the callous thrown out from each extremity of the bone did not meet by a considerable space. Consequently it became necessary to supply the want of a Tibia by artificial means, which, however, in conjunction with the support the Fibula afforded, has given the patient no inconsiderable advantage over those cured by amputation. H.

It

It is no incurious circumstance, that in tracing the history of our profession minutely, we are able to correct many mistakes which have generally prevailed; to strip many persons of the inventions that have been ascribed to them; and restore the honour of many discoveries to those whom they justly belong to. It is a fact I believe generally received, that, till the time of AMBROSE PAREY, no other method had been practised to stop the hemorrhage of arteries, except that of actual cautery; and that this great surgeon, struck with the cruelty as well as the precariousness of this method, invented the ligature. Nothing can be more false, and injurious to many persons, than this assertion. This honour does not certainly belong to him, nor can we even allow him, (as we shall hereafter see), that of having first proposed the needle to facilitate the operation. In the time of ALBUCASIS, as we gather from the history of his writings, there were four known ways of stopping the flux of arterial blood, all practised with equal success. The first was cautery; the second was the total division of the opened vessel, the extremity of which retracting, diminished its diameter; the third was the ligature*; and the fourth, the application of astringents. ALBUCASIS, seems even to have been acquainted with the coagulum or plug, which being formed at the orifice of the artery, stops the hemorrhage, and the existence of which, M. PETIT among the moderns has first demonstrated. The following quotation may enable the reader to judge.—“*Quamprimum digitis suis comprimat arteriæ orificium, et constringat eam valde donec obsessus sit sanguis, et digitus non removeatur effundatque celeriter aquam maxime frigidam, donec congeletur et ingrossetur sanguis.*”

ALBUCASIS distinguishes very properly the various treatment necessary for different abscesses, according to their nature, or situation, and very judiciously advises that some should be opened before they come to maturity. In these last he includes such as happen near the joints, lest the matter should corrode the ligaments.

* “*Ligetur Arteria cum filo ligatione forti,*” lib. 1. cap. 57.

He speaks of the method of extracting any foreign body by a sponge, fastened to a thread; and invented an instrument for this purpose, which is engraved in his works. But as we have restored to him the honour of a discovery which he has been deprived of, we must with equal justice take one from him which he falsely ascribes to himself; for when he speaks of circumcision as an operation of his own, he surely did not recollect the elegant description given of it by PAULUS ÆGINETA, nor what CELSUS had said of it, in his chapter on the phymosis.

He has however one other circumstance peculiar to himself; which is, that he is the first who has given descriptions of the instruments proper for each operation, and taught the method of using them.

In the *thirteenth century* several surgeons appeared in Italy; ROGER OF PARMA, JAMÉRIUS, BRUNNUS, and THEODORIC, but they were all fervile copiers of ALBUCASIS. GULIELMUS DE SALICETO, contemporary with THEODORIC, is the most original writer of all these, for which reason I shall take some notice of his practice and writings.

He was born at Placentia, and exercised his profession at Verona, where he died about the year 1277. Convinced of the insufficiency of topical applications in many chirurgical diseases, he made a free use of the knife, and of Cautery, in imitation of the Greeks and Arabians. ALBUCASIS is his chief model; but although he has copied him in several places, yet his surgery contains many things that are peculiar to himself. Though he considered the Hydrocephalus in general as an incurable disorder, yet he mentions an instance of one, in the hospital at Cremona, which was cured by the efforts of nature alone; and of another which he cured himself by applying the cautery once to the forehead, and twice to the occiput.

Many good precepts are found in his works upon wounds, and upon the treatment of them. He mentions several causes that impede the reunion of wounds, and reduces them to the number of ten. Some of

those are ingeniously suggested, and he lays down the method of remedying each.

GULIELMUS DE SALICETO likewise speaks of the operation of castration, and as he says nothing of tying the spermatic cord, we may presume he did not practise it: he only sewed up the skin of the scrotum, leaving an opening at the lower part as a drain for the matter, and sprinkled the wound with astringent powders.

LANFRANC, who was born at *Milan* in the thirteenth century, studied under SALICETO. Italy being then disturbed by the factions of the *Guelphs* and *Gibelines*; these commotions compelled him to leave his country, whence he retired to France, and fixed his residence at first at Lyons; but in the year 1295 he repaired to Paris, where his reputation had already gone before him.

The work published by this writer is entitled *Chirurgia magna et parva*, printed at Venice, in folio, and at four different times. It consists of five treatises, divided into sections and chapters. The first and second treat on wounds, both simple and complicated. The third treats of cutaneous diseases, of abscesses, of hernias, of the stone, of disorders of the eyes, nose, ears, &c. The fourth speaks of fractures, and luxations; and the fifth, of the several instruments used in Surgery.

He is the first writer I know of, who lays down the rule to distinguish the wound of an artery, from that of a vein. In the former case he says, that the blood comes out by jerks, while in the latter it flows in a uniform, steady stream. His mode of treating this accident is remarkable. He advises the Surgeon called in, to apply one finger upon the orifice in the vessel, so as to prevent the flux of the blood, and to hold it there for an hour, in order to give time to the blood to coagulate. He then directs the application of an astringent powder, and if this be not successful, advises the use of the ligature.

At this period in France we find PITTARD, chief Surgeon to three Kings of that nation; *Lewis the First, Philip the Bold, and Philip the Handsome*. PITTARD was the first who formed the Surgeons into one body, or society, which was the foundation of what is now called the Academy of Surgery, at Paris.

HERMANDAVILLE, who was a pupil of PITTARD's, and taught Surgery at Montpellier, was one of the most learned men of his time. He wrote a course of Surgery, divided into five treatises. As this book has never been printed, Baron HALLER doubts whether the author wrote any thing; but there are two manuscripts of his work extant, one in the King's library at Paris, the other in that of the Sorbonne. It is written in Latin, and is said to be an improvement upon the work of his master.

At the same time there lived at Paris four surgeons, whose humanity, and the desire of public good had brought together in the same house.—They were then distinguished by the honourable name of the four masters in Surgery—Their time was devoted to the care of the poor, and their house was a kind of temporary hospital in which the distressed were always sure of meeting with every assistance the surgery of that age could supply. They collected in one Treatise, which appeared under the name of the Four Masters, all they had learned from a long and attentive experience. GUIDO DE CAULIACO acquaints us, that he obtained a great deal of information from this work, and puts it upon a par with the writings of the principal men in this art. It has been lost about one hundred years, though some of the remains of it were seen a few years since, in the University of Navarre, but the characters were much defaced, and the book almost destroyed by the worms.

In the *fourteenth century* lived GUIDO DE CAULIACO, mentioned above. His work consists of two parts, the first on anatomy, the next treats of surgery. He practiced at Lyons for several years, and at last was called to Avignon, where he was physician to Pope Clement the Vth, and his succeſs-

successors. The principal writer he copies, is ALBUCASIS. He copies him, however, with judgement, and moreover gives an abridged history of the state of surgery in his time, observing that it was divided into five sects, each of these professing to follow their several masters.

GUIDO DE CAULIACO was certainly one of the ablest of the ancient surgeons. He treated the art in a scientific manner, and performed almost all the operations that are in use at this day. His remarks on wounds of the head are particularly worth attending to; and we find no author before his time who mentions the cure of a wound in the brain, with loss of substance, except one instance from Galen already quoted. He hesitated not to perform the operation of the empyema, a practice unfortunately too much neglected, and has censured SALICETO for recommending the incision to be made too low down in the Thorax, by which he says the diaphragm is in danger of being wounded, since it rises higher in the Thorax, in some people, than in others. This is certainly a very judicious remark. He performed the operation for the cataract by depression; and his work may be considered as more valuable in surgery than any that had appeared before, or that appeared for a long time after. It deserves to be much more generally read than it is.

But while we bestow all due encomium on foreign writers, let us not forget those of our own country. The first of these in point of time was GILBERT, surnamed the Englishman, who flourished in the *thirteenth century*. He was a good classical scholar, and a man of learning, but no very great adept in surgery, if we may judge from the things relative to this art, which are found in an only publication of his, entitled *Compendium totius Medicinæ*. It appeared first at Lyons, in Quarto, in 1510, and was reprinted at Geneva under the title of *Laurea Anglicana, seu compendium totius Medicinæ*.

The next I shall mention, is JOHN OF GADDSDEN, Fellow of Merton College, Oxford, and author of the famous *Rosa Anglica*. This book was greatly esteemed at that time, insomuch that our Poet Chaucer does
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the author the honour to rank him among the most celebrated writers in medicine. GUIDO DE CAULIACO, who wrote after him in the same century, was of a contrary opinion, and his expressions about this book are somewhat remarkable. “*Ultimo insurrexit una fatua Rosa Anglicana quæ mihi missa fuit, et visa, credidi in ea invenire odorem suavitatis, et inveni fabulas Hispani, Gilberti, et Theodorici.*” Although this censure of GUIDO’s might in some respects be just enough, as it must be confessed that our countryman was little more than an Empiric, yet he was certainly an Empiric of the better sort, and perhaps only professed being such from pecuniary motives, for he undoubtedly was considered in his time as a man of learning, and a judicious practitioner. JOHN, however, was a man of that kind to whom nothing that looked like the profession came amiss.—He was literally and truly one of those persons who, according to an elegant metaphor much used among us at present, *fought both horse and foot*. If a patient was afflicted with the stone, JOHN was the man who would attempt to dissolve it. For Epileptic Fits, he had an anodyne necklace, and, for the most violent paroxysm of the Gout, an infallible cataplasm. He declares himself to have been a very dextrous bone-setter, and, upon occasion, would extract a rotten tooth. He was very assiduous in inventing lotions for preserving the ladies’ complexions, would even be complaisant enough to cut their corns, and as for those troublesome insects which now and then infest a gentleman’s head, no man had a more effectual, and less offensive, method of destroying them.

Such was our countryman JOHN OF GADDESSEN, upon whose history I have been perhaps more particular than he deserved, not only because he was one of the first English surgeons, but also because he was the first ever employed at Court, for before that time, all the physicians and surgeons belonging to the Royal Family had been foreigners.

Not long after JOHN OF GADDESSEN, JOHN ARDERN, a surgeon, contemporary with GUIDO DE CAULIACO, made a considerable figure in this country. He left behind him a large volume of physic which still exists among us in manuscript. It is rather surprising that this book
should

should never have been printed, for it is certainly as useful a work as any which appeared about that time, except that of GUIDO DE CAULIACO. He seems to have been the first improver of surgery in England, for before his time our countrymen had not been very conversant in surgical operations. Dr. FREIND says, that he was a man of probity and experience; as indeed is in some measure evident from the unaffected simplicity of his writings. Among them there is a long treatise on the *Fistula in Ano*, which was translated by JOHN READ in 1588.

In the *fifteenth century*, Surgery made a rapid progress in Italy. The example of the Arabs had excited the emulation of the Italian surgeons, who applied themselves seriously to the improvement of their art. PETRUS DE ARGILLATA was one of the most enlightened of this period. He wrote six books of Surgery, which went through several editions at Venice; and this work is full of interesting observations made by the author in the course of his practice. He relates ingenuously the faults which he happened to commit, in order to prevent others from falling into the same errors; a rare instance of candour, and such as unfortunately is not sufficiently imitated. ARGILLATA treats of the Phlegmon, and its cure, then of Erysipelas, of Eruptions, and of all inflammatory diseases belonging to Surgery; of Gangrene, and of the pestilential Carbuncle. The doctrines of Abscesses, Scrophula, and Cancer, are then considered, together with the remedies proper for each of these complaints. A third part treats of wounds in general; and in particular, he mentions an instance of a wound in the arm, the effect of which was an immediate cessation of muscular motion, without the loss of sensation. There is reason to believe he is the first author that has made this observation.

PETRUS DE MONTAGNANA practiced physic and surgery about the year 1440, and was esteemed a man of consummate skill in his profession. The works of this writer are very numerous. Among them several surgical diseases are treated of, under the title of *Consilia de Ægrotudinibus*, &c. &c. All matters relative to our art, that are to be found in MONTAGNANA, are discussed with much precision and clearness.

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In the beginning of the *sixteenth century* a new scene was opened to the profession, by the breaking out of the *Venereal Disease*, a disorder till then unknown; and in the course of this century many great men appeared in the profession of surgery.

The first that occurs is WILLIAM VAVASSOR, Serjeant Surgeon to FRANCIS I. King of France. Though he never published any thing, yet his name deserves to be mentioned, as he was a man of so much consideration in his time, that he obtained of the King a grant of the privileges of an university to the Society of Surgeons in Paris.

About this time HERY, another French Surgeon, was sent by FRANCIS I. into Italy, to cure his troops afflicted with the *Lues*. HERY resided at Rome, where he learned from BERENGARIUS CARPI the method of mercurial frictions. When he returned into France, he published an accurate and learned account of this disease.

It may not here be improper to mention that most of the writers in this century upon the Venereal Disease were Physicians, so that they scarcely belong to this History. I shall, however, just observe, that these writers are all collected in one volume folio by Boerhaave, under the title of *Scriptores de Morbo Gallico*. Among them, the writer who has given the most circumstantial account of the disease and its method of cure, is NICHOLAS MASSA of Venice. His treatise contains almost all that is known on the subject of the *Lues* at present*. It must be observed, however, that no mention is made by the first of these writers of the *Gonorrhœa*; for this was probably a symptom which made its appearance afterwards.

* This assertion of the author is rather too unqualified, as those who have ever looked into this treatise will not hesitate to allow. It is, however, one of the best in Boerhaave's collection, and has fewer exceptionable parts than even the productions of those who wrote after him. One practical remark of his is particularly worthy of mention. He commends the use of occasional vomiting to relieve Venereal pains; a practice which I have known to be attended with extraordinary good effects. H.

The other Italians who flourished in the sixteenth century are, first JOHANNES DE VIGO of *Genoa*, a man of great erudition, who was chief Surgeon to one of the Popes. He has left a chirurgical work consisting of nine books, which ought to be read by every Surgeon, as they treat circumstantially on every branch of the art.

I shall only take notice of two circumstances, in this writer, which particularly elucidate the history we are giving.—The first is, his having mentioned the use of the ligature for stopping hemorrhages. It is a custom with some people, he says, to tie the veins and arteries when opened, with a needle and thread, with which they close the sides of these vessels—“*Modus autem ligationis. Eam aliqui efficiunt intromittendo acum sub vena* “*desuper filum stringendo.*” We have before seen that ALBUCASIS mentions the same method, though he has not pointed it out so explicitly. The next circumstance is, that VIGO is certainly one of the first, if not *the* first, who used *Mercury* in the cure of the Venereal Disease; an honour which is solely given to CARPI.

JACOBUS BERENGARIUS CARPI, and not CARPUS as he is usually called, practiced Surgery with distinction at Bologna. Though it appears, from what has been said above, that VIGO must have used Mercury in the *Lues* as soon as CARPI, yet the honour of the discovery may belong to both of them, for VIGO's edition appeared only two years before the publication of CARPI. However this may be, it is certain that CARPI acquired so great a fortune by his practice in the Venereal Disease, that he left a quantity of plate, besides a considerable sum of money, to the Duke of Ferrara, as we are informed by FALLOPIUS in his treatise *De Morbo Gallico*. But though VIGO and others had used Mercury in the Venereal Disease before CARPI, yet he was the first who cured by the mode of mercurial frictions, which was in itself certainly a very considerable improvement. He also wrote a treatise *De Fractura Cranii*, which contains nothing worthy of notice.

MARIANUS SANCTUS was a pupil of VIGO, and famous in the profession, for his method of cutting for the Stone by a particular apparatus. He attributes the invention of this method to JOHANNES DE ROMANIS, from whom he confesses that he learnt it. MARIANUS has also published some other works, which are all in GESNER's Collection of Surgical Writers, but none of them are worth attending to, except his treatise on the Stone.

ALPHONSUS FERRUS was public professor of Surgery at Naples, and in 1534 was elected first Physician to Pope PAUL III. He published a treatise on Gun-shot Wounds in three books, which is one of the first that appeared. This treatise, though full of judicious and useful precepts, is, by an inconceivable fatality, very little known amongst us. Those who shall take the trouble to read it, however, though ever so well versed in their profession, will not find their time misemployed. There is one remarkable passage in this work. Speaking of hemorrhages, he says, "yet if the vessel opened, be of any size, nothing but the ligature will succeed; in order to apply this, we make use of a crooked needle, pointed at one end and perforated at the other; this needle must be passed through the flesh and the thread left, with which, the vessel that bleeds is to be tied. This method is always effectual, and stops the bleeding of the arteries." FERRUS does not assume the discovery of this method to himself; and indeed how is it possible he should, since we have seen that ALBUCASIS, VIGO, and others before mentioned, had employed it with success. He also wrote a treatise on the Ischury produced by obliteration of the neck of the bladder, which contains some curious details. His reflections on sounds, and the art of founding the bladder, are worthy of the first Surgeons of the present age. He employed sounds of different metals, and knew the use of bougies, for which he has given a formula. He has carried his improvements in this part of Surgery still farther, and has employed, for the purpose of destroying Caruncles in the Urethra, the stems of mallows, parsley, fennel, &c. and covered his bougies with deterfive or suppurative ointments, according to the variety of his intentions.

BARTHO-

BARTHOLOMÆUS MAGGIUS of *Bononia*, a man of great merit in the profession of Surgery, wrote a treatise on Gun-shot Wounds, which is the second of the kind, and contains some observations on wounds in general, and on amputations. This also is included in GESNER's collection.

VIDUS VIDIUS of *Florence*, published four volumes on Surgery; he was a learned commentator and translator of some parts of HIPPOCRATES and GALEN.

GABRIEL FALLOPIUS, a very eminent Anatomist and Surgeon of his time, was professor at Padua; and besides several anatomical pieces, has left us almost a complete system of Surgery, exclusive of the operative part. His book on ulcers is very diffuse, and many useful things may be collected from it. His treatise *De Morbo Gallico*, is printed among BOERHAAVE's collection.

In this century lived CASPAR TAGLIACOTIUS, a man rendered immortal by the facetious author of HUDIBRAS, for his extraordinary method of making supplemental noses, ears, or lips, from any thick fleshy part of another person's body; concerning this practice, he has left us an express treatise.

JOHANNES ANDREAS, of *Venice*, published a complete body of Surgery, both operative and pharmaceutic, to which he has added, descriptions and plates of all the surgical instruments in use at that time.

The only French writers I shall take notice of in this *sixteenth century*, are FRANCO, AMBROSE PAREY, and GUILLEMEAN.

PETER FRANCO was a native of France, though he practiced his art for a considerable time in Switzerland. He acquired a great deal of knowledge in Anatomy and Surgery, and appears to be the first French author who wrote scientifically on the art. His candour and honesty are

evident from the frankness of his confessions, and the plainness and simplicity of his style. He has left behind him two works, one entirely upon Herniæ, the other upon that, and almost every other part of Surgery. His description of the several kinds of Herniæ is very exact, and the detail of the symptoms very accurate. His method of cure is by the *punctum aureum*, which he prefers to all others. In treating of the Hydrocele he proposes several methods of cure, among which, he describes the seton, but prefers incision.

He is also the inventor of the high operation for the Stone, to the discovery of which he was urged by necessity ; for, having cut a child about two years old by the greater apparatus, or JOHN DE ROMANIS's method, and the Stone being too large to be extracted at the Perinæum, he made an incision above the Os Pubis, and took it out by that opening, by which fortunate thought he saved the life of his patient

AMBROSE PAREY practiced and taught Surgery, with great diligence, for fifty years successively. He was chief Surgeon to HENRY II. FRANCIS II. CHARLES IX. and HENRY of France. He has published a complete system of Surgery, in which we find a variety of improvements ; nay it may very justly be said of this work, that there is scarcely any part of Surgery which he has not treated with more knowledge, clearness, and precision, than any preceding writer, so that he is not improperly considered as the father of Surgery in France. It would be doing him injustice therefore, to make any extracts from this performance, for the whole deserves to be read with the greatest attention.

He likewise published a treatise on Gun-shot Wounds, which contains a number of interesting observations and judicious precepts, confirmed by the long experience the author had acquired in following the army. This is not so original, however, as the former work, for the same precepts nearly, are to be found in LANGIUS, FERRUS, and others.

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With respect to the circumstance of stopping hemorrhages by ligature, which AMBROSE PAREY describes with great clearness, it may be observed, that he does not take the discovery to himself; though his countrymen, either from ignorance or vanity, have been so fond of ascribing the honour of this invention to him. Neither indeed is the crooked needle, or instrument used for this operation, invented by PAREY; for, in the passages before quoted from VIGO and FERRUS, this circumstance is mentioned. The fact seems indeed to be, that AMBROSE PAREY is the first *French* Surgeon who ever spoke of the ligature. This method of securing the vessels had long been in use in Italy, and probably PAREY might have learnt it when he followed the French army into that country, or perhaps he might have taken it from FERRUS who had described it very fully. For the latter published his work long before AMBROSE PAREY's appeared, FERRUS being far advanced in years before the other wrote. The original works of AMBROSE PAREY are written in French, and he is said not to have understood Latin. One of his pupils, however, gave an enlarged edition of them in that language, with the addition of several new plates*. Among the Germans, Swifs, &c. of the sixteenth century, only three seem to merit our notice. These are PARACELUS, VESALIUS, and FORESTUS.

PARACELUS was born in Switzerland. He was very famous for his knowledge in Chemistry, which at that time began to be much cultivated. He published two volumes on Surgery, one called *Chirurgia magna*, the other *Chirurgia minor*. They contain several arcana for the cure of ulcers, and other chirurgical complaints. It appears indeed from the testimony of GESNER, as well as that of his pupil APOSINUS, that he was, as the latter expresses it, miraculously successful in curing the most malignant and stubborn ulcers. This is not in the least improbable; for

* It should farther have been observed with regard to this author that, in his treatise on Gun-shot Wounds, he reprobated the practice of dressing them with hot and irritating oils, an improvement of some importance, considering the state of Surgery at that period, and the strong prejudices of the older practitioners in favour of that mode of treatment. H.

however modern Surgeons, seduced by the brilliancy of operation, by which fame and profit are more easily attained, may affect to despise topical applications, yet there is great room to conjecture that any one who pays a proper attention to them, will be very likely to cure complaints, which may baffle all other means. A knowledge of Chemistry will probably supply a curious and observing man with many remedies, which he may use with advantage in Surgery; PARACELSUS is said to have been very bold in his topical remedies, and frequently applied ointments to parts affected with cancer.

ANDREAS VESALIUS of *Brussels*, was deservedly famous for his knowledge in Anatomy. His Surgery is distributed into seven parts, in which nothing which concerns the practice of that art is omitted. It is not, however, equal to what we might expect from a man of his understanding and genius. FALLOPIUS, of whom we have already spoken, has written several criticisms on VESALIUS. The latter in his answers seems hurt by them, and FALLOPIUS has in general much the best of the controversy.

PETRUS FORESTUS, a Dutchman, was a very judicious and experienced practitioner. He was the first professor in the university of Leyden; and has published several observations in Surgery, which contain many curious particulars.

About this time the history of Surgery begins to be so diffuse, and the writers are so numerous, that it would be endless to enumerate them all, and would exceed the limits of our present plan. I shall therefore only take notice of the most celebrated among them.

Among the most distinguished writers of the *last century*, were PIGRÆUS, COLOT, TOLET, and LE CLERC.

PIGRÆUS was a pupil of AMBROSE PAREY. His chirurgical works are a sort of abridgement and improvement on those of his master, and are written with great clearness and elegance of style.

COLOT

COLOT was a famous Lithotomist in France. He is said to have performed the operation by the *apparatus major* with great success, and is recorded as the first who ever cut adults and old people. Lithotomy was afterwards preserved for some time in the COLOT family, as their peculiar property, and descended as an hereditary possession from father to son.

FRANCIS TOLET, Surgeon to the *Charité* at Paris, was a very expert Lithotomist, and published a treatise on that operation, in which are contained many useful remarks, either omitted or overlooked by all preceding writers on this subject.

About the end of the last century LE CLERC wrote a complete system of Surgery, by question and answer. It is calculated for the use of beginners, and though superficial, yet it is faithful, and to be depended upon for the instruction it conveys. It is certainly a book that may be useful to students.

About this time the lateral method of cutting for the Stone was first introduced into France, by FRERE JAQUES. Rude and unskilful as the method was in his hands, we shall see that it was the basis of all the improvements that have since been made in this operation, and of the present mode of performing it.

MERY, a famous Surgeon of the *Hotel Dieu*, who was witness to the first operation of FRERE JAQUES, and examined some of his patients after death, took the hint from thence, of writing a treatise on Lithotomy, in which he proposes this new lateral method, with the improvement of a grooved staff, introduced into the urethra to conduct the incision, of which staff he was the first inventor.

Among the Italians of the *seventeenth century*, the two most famous were, HIERONIMUS FABRICIUS *ab AQUAPENDENTE*, and MARCUS AURELIUS SEVERINUS. The first succeeded the learned FALLOPIUS in the professor's chair of Padua. He was a great admirer of CELSUS, calling him
“ *mirabilis*

“*mirabilis in omnibus*,” and applies to him the advice of HORACE with respect to the Greek writers—“*Nocturnâ versate manu*,” &c. He declares that CELSUS, PAULUS ÆGINETA, and ALBUCASIS, were the three principal sources from whence he derived his surgical knowledge. He was a man of great labour and learning. His writings contain many improvements in our art, one in particular, for which he deserves much commendation. I mean his abolition of the common practice of that age, of removing the testicle in the operation for the Bubonocoele; and his invention of a truss, which if the patient always wore, he would never be in danger of being exposed to the operation.

MARCUS AURELIUS SEVERINUS, professor at Naples, was certainly the most accomplished Surgeon of his time. He preferred the science of Surgery to that of Medicine, as we may judge from the title he gives his book—“*De Efficaci Medicina*.” In this treatise, which is divided into three parts, he teaches in what manner all external, as well as many internal and obstinate disorders, may be cured by an intrepid use of the knife, or by the free application of actual cautery. He likewise published a very singular treatise “*De recondita abscessuum natura*.” This work expounds the doctrine of Abscesses in a much more scientific manner than it had ever yet been treated. The last work of this truly surgical writer is entitled “*De Trimembri Chirurgia*,” in which he treats of the Dietetic, Pharmaceutic, and Chemical parts of Surgery. Another book has likewise been ascribed to him, which is a kind of Compendium of all his other works, but this is reckoned spurious.

In this century we meet with several Germans, Hollanders, and Danes, of note and reputation. Many of them wrote fugitive pieces, which are only to be found in the compilations of others, especially among the “*Centuriæ Observationum Chirurgicarum*,” published by GULIELMUS FABRICIUS HILDANUS. PETRUS UFFENBACHIUS, a very useful compiler, published a collection, in one large volume folio, of the writings of many eminent Surgeons, in which the doctrine of tumours, wounds, ulcers, fractures, and luxations, is fully explained.

About

About this time, several authors wrote professedly on the prognostics of wounds, or the rules for judging of the danger or fatality of any given wound. Of these, I shall only mention the last in point of time, though certainly the first in point of erudition. This is JOHANNES BOHNICES, a very learned professor of Anatomy and Surgery at Leipzig. His book "*De Renunciatione Vulnerum*" is the best that has ever been written on the subject, and exhibits so many remarkable instances of the fatality of wounds, however slight they may seem, that an attentive perusal of it cannot fail of furnishing the reader with much useful and necessary information.

In this century SCULTETUS wrote his "*Armamenta Chirurgica*," a book in which are given plates of all surgical instruments employed till that time, with a description of their use. JOHANNES BAPTISTA LAMBSWERDE reprinted this book, with considerable improvements, and the addition of one hundred surgical observations. It was published a third time by JOHANNES FILENGIUS, when it was corrected and enriched with some new plates, and improved by the addition of two and twenty observations in Surgery, ascribed to PETER VERDUIN, an eminent Surgeon at Amsterdam. This work was the first of the kind. GARENGEOT, a French Surgeon, has since given us in the present century a treatise on the instruments of Surgery, comprised in three Volumes Duodecimo, which contains a description of several instruments not to be found in SCULTETUS.

Among the Swiss of the *seventeenth century* are GULIELMUS FABRICIUS HILDANUS, and JOHANNES DE MURALTO. The surgical works of FABRICIUS HILDANUS are published in one volume folio, and are chiefly a collection of six centuriæ of surgical observations, illustrated with plates of instruments invented by the author and others. Though it contains several trifling things, yet some may be found from which a practitioner of knowledge and experience may derive improvement.

The works of JOHANNES DE MURALTO, professor of Anatomy and Surgery at *Zurich*, were published in one volume the beginning of this century at *Basil*, in the German language. They contain a short introduction to the whole art of Surgery, in which the doctrine of tumours, inflammations, wounds, contusions, fractures and dislocations, is explained in a very concise and instructive manner. He next describes the several operations of Surgery, and finishes with some observations of so extraordinary a nature, that their veracity might be called in question, if their author's character did not secure him against any suspicions of the kind. This author, I believe, has never been translated out of the German language, though he certainly deserves it, if for no other reason than that of his having first written a complete system of the art.

The principal writers among the Dutch, were HENRICUS ROONHUYSEN, and JOB VAN MECKEREN, both of *Amsterdam*, and both writers of observations in the Dutch language, which were afterwards translated into Latin.

JOHANNES MUYS of *Arnheim*, not only wrote some interesting observations in Surgery himself, but also published a system of the art, written by PAUL BARBETT, a Surgeon of *Amsterdam*, with curious and explanatory notes of his own. To these may be added JOHANNES VAN HORN, professor of Anatomy and Surgery at *Leyden*, author of the "*Microtechnie seu methodica ad Chirurgiam introductio*;" ANTONIUS NUCK, a very accurate Anatomist, who published a treatise on the operations; and CORNELIUS STALPART VAN DER WIEL, practitioner at the *Hague* and writer of several observations, among which one in particular deserves to be recorded, to wit, an instance of a patient who had fractured his skull, and was cured by the Trepan being applied twenty-seven times.

There are also many curious observations in Surgery, in the works of that celebrated Anatomist FREDERICK RUYSCH, professor of Anatomy and Surgery at *Amsterdam*, and famous for his anatomical preparations.

We will close the catalogue of Dutch writers with the mention of another Anatomist of our own time, ALBINUS, late professor at Leyden, among whose works are several observations useful in our art, particularly on the *Polypus*, on the *Paronychia*, on the *Fistula Lachrymalis*, and on the *Cataract*.

Neither are there wanting surgical writers of our own country in the *seventeenth century*; among these may be enumerated LOWE, GALE, and RICHARD WISEMAN serjeant Surgeon to King CHARLES II. The last of these was a man of the greatest eminence, and may justly be stiled the AMBROSE PAREY of the English. The same spirit of observation, the same attention, the same simplicity, and above all, the same amiable candour prevails in both of them. His System of Surgery is as useful as any of that period, and indeed much more so than any one published before in England. It is a work which no young Surgeon ought to be without. He has divided it into eight books, which treat of tumours, ulcers, of the diseases of the anus, of strumæ and other analogous diseases; of ordinary wounds, and of gun-shot wounds; of fractures, of luxations, and of the lues. He has also several interesting observations upon wounds of the head. WISEMAN blames the use of tents in wounds of the chest, and follows, in the treating of them, the method of *Magati*. In this circumstance he has forestalled *Bellost*. His remarks upon the *hæmorrhoids*, upon *Condylomata*, upon the descent of the *anus*, and upon *fistulas*, are inestimable. As the ingenuous confession of one single mistake is infinitely more useful, and makes a much more lasting impression than the recital of a series of the most brilliant successes, so our author has a more absolute claim to our admiration and attention from this particular circumstance. He relates his failures with as much exactness, as he relates his cures, and observes, particularly, that the mode of operating by ligature on the fistula in *Ano*, which he had practised, had often occasioned many dreadful accidents *. He gives several observations on the utility of actual

* I am wholly at a loss to account for this assertion, having carefully examined WISEMAN's treatise without being able to trace his *disapprobation* of the cure of fistula in *Ano*.

actual cautery in the cure of that most terrible disease the *polypus* in the *Antrum Highmerianum*, of which a deplorable instance lately occurred at the Westminster Hospital *.

His works indeed abound in sensible observations not unworthy even of this more enlightened age. He is the first of our countrymen, who treated of the art in a rational and scientific manner, for which his memory deserves to be revered by us. If his works were exempt from the superstition of the times, particularly where he treats of scrophulous disorders, it would be perfect in its kind.

We have now brought the history of our profession fully to the end of the *last century*, and in some parts of the world, have even carried it on to the beginning of this. But the improvements Surgery has received in the present century are so great, and the eminent men who have distinguished themselves in the art, so numerous, that it is impossible to give a circumstantial account of them.

In order however to compleat this general history of the art to the present time, it may be observed, that in the beginning of *this century*,

by ligature, or to discover (as I was anxious to do) what these dreadful accidents were. In the most untoward of the cases in which he employed it, he perfectly succeeded in the cure, and the ligature remained in the part not more than sixteen days.—He does not even speak, but by implication, of the temporary inconveniences which attend this mode. The reader will judge what were WISEMAN's sentiments of it by the following extract. Making a comparison between the cure by incision and that by ligature, after having stated his objections to the former, he says:—"The ligature *contuses the lips* in cutting them, so that they "require to be *digested* before they can unite, *in which time the sinus fills up and heals within*; "infomuch as the fistula may be judged to *cure above, as the ligature divides it below*."—Notwithstanding WISEMAN's success in the instances he has related, the practitioners of the present time will hardly be induced to prefer this mode to the more expeditious cure by the operation; yet, if any are disposed to follow him in the use of the ligature, his advice not to employ one of too great thickness, is, in the first place, worth attending to; and, secondly, not to wait for its cutting through the thick and callous edge of a fistula, but to divide that part by incision; both which evidently tend to facilitate the cure.—See note, p. 14. H.

* The particulars of this very extraordinary case are now in the possession of Mr. WATSON, and will be submitted to the public, with every necessary illustration. H.

LAWRENCE

LAWRENCE HEISTER was public professor of Anatomy and Surgery at the university of *Altorf*. In the year 1718 his System of Surgery first appeared in quarto, and in the German language. In the year 1719 he was called by his Britannic Majesty George the First, to the public professorship of Anatomy and Surgery at the Julian University of *Helmstadt*. Our English translation of this work is taken from the Latin edition, published by himself, with considerable additions and emendations, and it is incontestably the most useful, and best system of Surgery ever made public, since there is not any one point of the science, whether trivial or important, that is not explained with great accuracy, and in the most ample manner. But the prodigious length of it, the many things of which it might be abridged, and the various improvements which have been made since the publication of it, seem to bespeak the necessity of a new system; and it is to be hoped, that whoever undertakes this arduous task, will endeavour to contract his labours into a lesser compass *.

At the latter end of the *last* and the beginning of *this century*, the French Surgeons began to make considerable improvements in their profession. We have already mentioned M. MERY in regard to the operation of *lithotomy*. To this account may be added an anecdote not generally known, that he, together with M. PETIT, a man of great ingenuity, were the first who performed the operation for the cataract by extraction; an invention which has since been attributed to M. DAVIEL, a man of much inferior talents. M. PETIT has left behind him a treatise on diseases of the bones, in which the doctrine of fractures and luxations is treated in a compleat and masterly manner.

It must be owned that the French have had the merit of setting us the example, since they were the first who contributed to bring Surgery to

* The author's wishes in this respect have since been fulfilled in the excellent System of Surgery, lately published by Mr. BELL of Edinburgh. In this work all the improvements made in the art since HEISTER's time are very judiciously and correctly introduced. H.

the degree of perfection in which it flourishes at present. M. DE LA PEYRONE, Surgeon to LEWIS the Fifteenth, with great abilities in his profession, and excessive zeal for the honour of it, solicited, and at length obtained, for the body of Surgeons at Paris, the establishment of the Royal Academy of Surgery, which held its first meeting as an academic Body in the year 1731.

The Academy have already published several volumes in quarto, upon different parts of Surgery. These volumes contain varieties of improvements, and are certainly treasures of abstruse and critical knowledge, upon some of the most important, though before less cultivated, parts of the science. In them, are preserved and registered the names of all the Members of the Academy foreign or domestic, whether they have contributed their share to the composition of the volume or not. It is true, indeed, that the operative part of Surgery has been the chief object, towards which the improvements of the French have been directed. A course of operations, publicly read and afterwards published by DIONIS, a few years before the establishment of the Academy, had already indicated the necessity, and traced the way for the cultivation of this branch. This course, indeed, was the best system of operative Surgery that had ever been made known, and may be considered in many respects as a classical book even to this day.

But the labours of the French were not confined within the walls of the Academy, nor appropriated merely to the embellishment of academic productions, for, about the year 1742, M. LE DRAN, one of their first members, published his excellent treatise on the operations, the merit of which is well known in this country, since it was translated into our language by the late Mr. GATAKER, with the addition of a few critical notes by Mr. CHESELDEN. M. LE DRAN has also published a volume of *Observations*; and another, within these few years, which he calls *Consultations in Surgery*. This last work contains a variety of cases which are supposed to be stated from one Surgeon to another. The consulted Surgeon gives his advice, indicating what is necessary to be done. An answer

is returned, declaring the good or ill success which hath attended either the following or neglecting the advice proposed. Thus the case is carried on by question and answer, till the patient is supposed either to fall a victim to the disease and the method of treatment, or to recover.

Hence, it cannot but be evident, how useful such a book must be to practitioners in general, and more especially to those of little experience; for which reason, and because it is not so much known as the rest of his works, a particular account was thought necessary here: still, however, it must be confessed, that there are but few cases of consequence in it; and although the plan is most excellent, there is great cause to lament that it has not been executed in so masterly a manner as could be wished, or as might surely have been expected from a person of his rank in the profession; but, to say the truth, he seems to have been a man of only moderate abilities. His style is vulgar and inelegant, and his expressions coarse and obscene; but the very considerable experience, which a very long life and a very extensive practice had afforded him, together with his assiduity and laborious attention, are such recommendations as cannot fail of placing his surgical writings among the most valuable and useful in the profession.

To the labours of this century we are also indebted for that invaluable work, published by Dr. Astruc on the Venereal disease, in which its history and symptoms, whether in the state of Gonorrhœa or confirmed Lues, are so accurately, so minutely, and so clearly described, that I cannot but consider it as one of the most perfect productions of medical judgement and nice observation. I never collected so much useful and certain information from any book I ever read; and would recommend the constant perusal of it to all who would acquire a thorough knowledge of this disease, and of its various and complicated appearances; this I can do with the more confidence, as it is from my own experience, and from the frequent reading of it, that I have formed my opinion of its real and intrinsic merit. But it must be observed that my encomiums are bestowed chiefly upon that part of the work which treats of the Prognostic signs

or symptoms of the disease. The other, which relates to the method of cure, though it communicates the best practice known at that time, has received many and great improvements since the time of this writer.

Before I quit the account of these rivals of our chirurgical fame, let me be allowed to pay the tribute of friendship to the memory of one man among them, whom, from an intimate knowledge of his worth, I shall ever revere; I mean M. LE CAT, Surgeon of the hospital at *Rouen*: his writings indeed are few, and those, most of them fugitive pieces, either inserted in the Philosophical Transactions, or preserved as monuments of his superior abilities, in the essays published by the Royal Academy, upon the Theses proposed by them at different times for premiums. As often as he had written upon these occasions, so often had he obtained the prize; till at length the Academy sent him the honourable prohibition, by which he was intreated not to enter the lists again, but to leave future contests to persons who could engage in them upon more equal terms. He laboured for many years to bring the operation of Lithotomy to an absolute and determined degree of perfection. His publications on this subject, if abstracted from the controversy with which they abound, to the best of my judgement, are works of the greatest sagacity and knowledge in their kind. His operation was founded upon the clearest and most uncontroverted principles: if any fault could be found with it, it was in the instruments designed for the performance, and here it might perhaps admit of improvement. Exclusive of his profession, he was a man of much erudition; his ideas were abstracted, but clear; his apprehension lively, and his application most surprisngly intense; insomuch, that he scarcely knew what it was to lose even a moment of time. In performing operations, he was quick, sure, steady, and intrepid; though, at the time I saw him operate, old age and infirmities might not have shewn him to me in the most favourable light in this particular. Being, truly and strictly speaking, such a man as I have described, we need not be surpris'd that he was continually exposed to the malignity of envy.

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The last writer mentioned among our own countrymen was RICHARD WISEMAN, who wrote about the middle of the last century: from that time till we were some way advanced in the present century, Surgery made but little progress in England. The example set us by the French, and the appearance of so many able men in all other branches of science at that period in England, at length raised a spirit of emulation in the professors of our art, which, we may venture to say, without partiality, soon exceeded the efforts of those who furnished the example.

Mr. CHESELDEN may, with as much truth, be reckoned the father of Surgery in this kingdom, as Mr. SMELLIE has since been of the obstetric art. The operation of Lithotomy was still practised in France upon very uncertain principles. FRERE JAQUES had indeed drawn all the rude outlines of the lateral method, which had received no improvements, but from the invention of a grooved staff by M. MERY. Here then the operation was at a stand, and the French still continued to perform it in the complicated, dangerous, and almost certainly fatal way, used by MARIANUS SANCTUS, and commonly called the *greater apparatus*. CHESELDEN was the first who reduced the operation to sound principles, and invented a simple method of performing it, which he practised with as much dexterity as success, so that no real improvement has since been made upon his operation. But this was not the only advantage Mr. CHESELDEN procured to our art, he made the whole system of surgical practice more simple, and invented a method of tying the tonsils when indurated and swelled to such a size as to endanger suffocation. Before his time, it had been the universal practice to extirpate them with a knife, a practice which often endangered, and sometimes put an end to the life of the patient, from the ensuing hemorrhage. Mr. CHESELDEN's method removed this danger by a new operation, as safe in the performance as it was ingenious in the invention.

In this century, Dr. JAMES DOUGLAS proposed the high operation for the stone, which his brother, Mr. JOHN DOUGLAS, performed upon many occasions. JOHN, indeed, did all he could to promote this operation,

tion, and render it universal, but his efforts, however strenuous and violent, were of no effect. Mr. CHESELDEN published an account of the operation, which was soon after dropped, because of the ill success which had attended it.

I shall close this history with some account of Mr. SAMUEL SHARP, not long since dead, and who was many years Surgeon to Guy's Hospital. He was educated under Mr. CHESELDEN; and under the eye of such a master, it is not singular that a man of Mr. SHARP's abilities should make a great progress. He was a man of infinite dexterity and neatness in his operations, a qualification in which he could only be exceeded by his extraordinary penetration and judgement in all chirurgical matters: but it is hardly necessary to attempt any farther encomiums upon him, since his works have so effectually bestowed them. His *System of Operations*, and his *Critical Enquiry*, are the only works he ever published. They contain simple, familiar, scientific, British surgery, and are certainly masterpieces in that science. Besides the new and various instructions they convey, they are not less admirable for the elegant manner in which they are written: the style is easy and flowing, the periods round and harmonious, the expressions concise, clear, and unaffected; and, to many, the charms of his language are as alluring, as his instructions are sound and useful. The only wish usually excited in the minds of his readers, is, that he had written more on subjects in which he seemed so well fitted to excel.

But these excellent works are not the only obligations we owe to the Surgeons of this century in England; they were the persons who solicited and obtained a separation of the Surgeons Company from that of the Barbers, to which they were before united, and they exerted themselves, in this instance, as much for the honour, as they had before laboured for the improvement of their profession.

Thus have we traced the history of Surgery down to the present time, and though what has been said amounts to no more than a general account, yet it is probably sufficient to enable us to form a just estimation of the
difference

difference between ancient and modern Surgery: yet I must farther be permitted to observe, that it is a matter of no small surprize that some learned writers among the moderns, particularly Dr. FREIND, should have asserted, not only that the art of Surgery has received scarcely any improvements among the moderns, but also, that many operations were executed by the ancients, which the moderns, either through ignorance or neglect, have ceased to perform*. What has been advanced in the foregoing pages, will surely be sufficient to invalidate this assertion. Has it not appeared, for instance, in how many circumstances the practice of CELSUS, GALEN, PAULUS ÆGINETA, and even ALBUCASIS himself, (the four best writers among the ancients since HIPPOCRATES) were deficient? Were they not strangers to the various methods we employ to reduce Herniæ by the Taxis? And if the knife became necessary, how ignorant were they of the proper method of performing the operation? Have we not seen that in their days it was a customary thing to extirpate the testicle with the hernial sac? a most ignorant and cruel practice, which was not fairly abolished till the last century by that learned Italian, FABRICIUS AB AQUAPENDENTE. The operation of Lithotomy they had but one method of performing, and this was by cutting on the gripe, a method so limited, that CELSUS, the first describer of it, confines the practice to children

* Here, I apprehend, the author alludes to the sentiments of Mr. C. BERNARD, which Dr. FREIND, in his History of Physic, Vol. I. page 113, has adopted and quoted at large. The substance of the argument is given us in the following words: — “ If we enquire into *the improvements made by the moderns in Surgery*, we shall be forced to confess, that we have so little reason to value ourselves beyond the ancients, or to be tempted to condemn them, as the fashion is among those who know little and have read nothing, that we cannot give stronger or more convincing proofs of our own ignorance, as well as our pride. I do not pretend that the moderns have *not at all contributed* towards the improvement of Surgery; that were both absurd and injurious, and would argue as much folly as that which I am reproaching: but that which I am contesting for is, that it consists rather in refining and dressing up the inventions of the antients, and setting them in a better light, than in adding many important ones of our own.” In the concluding sentence, he says, “ But how many *operations* are there now in use which were unknown to the antients? I fear, upon a due enquiry, it will be found that more useful ones are omitted or discontinued than have been invented by us.” H.

from nine to fourteen years of age; a method apparently so uncertain, that however silent the practitioners of it may have been with regard to its success, it is still clear to every person conversant in anatomy and the nature of the disease, that it certainly must have failed in many instances, though practised with the restrictions laid down by CELSUS. If Lithotomy had not, therefore, received numberless improvements from the knowledge and attention of the moderns, all children under nine years of age, and all adults, would still have been left to perish or linger out a weary life, in continual pain, from the paroxysms of this most deplorable disease: but we have cause to exult that these deficiencies have been supplied by a series of ingenious improvements, and that infants of the tenderest years, as well as persons of the most advanced age, are now relieved, and successfully freed from this cruel disorder, by the work of our hands. In this instance, our superiority to the ancients is incontestably manifest, and it is a superiority which we owe entirely to the sagacity and labour of our own countrymen in the beginning of the present century. Several other instances might here be added, which would equally tend to illustrate the same superiority; but these are sufficient to settle the comparison. It may not, however, be improper to remark that, Anatomy and Surgery being sister arts, it is evident that any improvement in the one, must have been attended with some advantages to the other. In this view, the Surgery of the moderns will appear in the most conspicuous and favourable light. The several parts of the human body have never been so accurately described, and consequently the uses of them have never before been so minutely investigated and so indisputably ascertained, as they have been by the modern physiologists. The discovery of the circulation of the blood, in the last century, by our laborious and accurate countryman Dr. HARVEY, first opened a new scene to the eyes of the medical world. This, and the discoveries immediately connected with it, reduced the practice of Surgery as well as Physic to fixed and rational principles; for we certainly become much better fitted to perform surgical operations when, from previous anatomical knowledge, we know exactly how to account for the consequences of them.

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There is one point of practice however, in which (as has been already observed) the moderns, perhaps from an ill-grounded prejudice, have been too remiss, since it appears to have been extremely prevalent among the antients, I mean the application of the actual Cautery. It is to be wished, that, in some *desperate* cases at least, this remedy might be fully tried, in order that, from a few experiments, made with care, and related with candour, we might be able to judge whether the antients really derived all those benefits which they pretend to have experienced from it or not.

Upon the whole, it may be fairly concluded that the present practice of Surgery is superior in most respects to that of the antients. This however affords us no reason for neglecting the perusal of their works. We shall find they abound in sound precepts and accurate observations, which the sagacity of the moderns has not been able either to contradict or improve. Besides, it is natural to suppose, that whoever traces the progress of medicine and Surgery, from their first rise, with a spirit of attention and enquiry, will, in all likelihood, be furnished with new and interesting ideas, which might otherwise entirely escape his observation. It is, in fact, highly beneficial to the mind, to be familiarized with the contemplation of the gradual improvements, or various revolutions, which any science may have undergone. The antients therefore may not improperly be considered as persons of an extraordinary stature, the Patagonians of the time, who, taking us up in their arms and raising us above their own heads, discover prospects and countries to us, which they themselves could never distinguish.

It may not be improper to conclude this sketch with a short inquiry into

THE QUALIFICATIONS NECESSARY TO FORM A GOOD SURGEON.

THERE is undoubtedly no profession in which greater natural qualifications are required, than our own. The more liberal nature has been in her gifts, the more carefully her first impressions have been cultivated by
rational

rational education, by so much the better will a man be fitted for the practice of it.

Youth, firmness, dexterity, acute sensation, sound judgement, and humanity, are the qualifications which may be considered as necessary for a Surgeon.

We will begin with *Youth*, by which I mean that period of life, when the body and mind are supposed to be arrived at their fullest vigour. Celsus tells us, “*Esse autem Chirurgus debet adolescens, aut certè adolescentiæ propior*”—so that, if a man has made good use of time, and has acquired sufficient knowledge to direct him, he cannot well be too young to perform operations. On the other hand, there is a time perhaps, if a man is willing to preserve the reputation he has acquired by long and extensive practice, when he should lay aside the knife, and content himself with superintending the operations of others. The very cautions which age naturally brings along with it, are apt to degenerate into a timidity highly unfavourable to that adroitness which should distinguish the motions of a good operator.

Firmness, is the second qualification of a Surgeon, and is indeed extended to the mind as well as the body. It implies resolution to go through his operations, however hazardous or severe, undisturbed by any external or accidental circumstances, unmoved by the cries of the patient, and unawed by the presence of the spectators, however numerous or respectable. It implies presence of mind, to enable him instantly to determine in what manner he shall act if any unexpected accident or appearance should occur in the course of his operation. If, for instance, while he is amputating, his Tourniquet were to break, or if some large vessel should, in any operation, run out of the usual course, and come in the way of his knife when he has reason to think himself at some distance from it. And lastly, firmness implies, a steady, unshaking hand—“*Manus strenua, stabilis nec unquam intremiscens.*”

Dexterity

Dexterity in a Surgeon argues a manner of so using his instruments, that he shall appear not to be embarrassed with them. It argues agility of motion so as to finish an operation with all convenient dispatch; and neatness in performing it, so that his incisions shall not be carried on in parts where there is no need of them, nor the parts incised left unequal or jagged, either of which circumstances is very unseemly in the eyes of the bystanders. It also requires, that the Surgeon should be equally ready with his left, as his right hand, "*Nec minus sinistra quam dextra promptus*".

Acute sensation, or having all the senses in their most perfect state, is extremely necessary to a Surgeon. Celsus confines this to the sight "*Acies oculorum acer et clara*". But in this, he is surely guilty of an error. The steady penetrating eye of the Eagle, may indeed prove very useful to the practitioners of our art, but there are many cases where this is of little avail unless we appeal to the testimony of the other senses also. It is possible, that instances may occur, where the delicacy of the touch, the quickness of the hearing, the nicety of the smell, and sometimes even the distinguishing property of the taste, are absolutely needful to direct our judgement. How frequently does it happen, when we cannot be determined by one sense, that we call in another to its assistance, and thus from the combination of both, form a diagnostic, which we should not have been able to ascertain from either of them separately?

A *sound judgement*, is, on many accounts, of the utmost importance. It enables the Surgeon to form judicious prognostics, by which he may calculate the chances for or against the success of any operation proposed. It is often not less useful in deciding for the patient's utmost possible advantage, than in preserving his own reputation and keeping up the credit of his art. It teaches him to determine with precision, the time necessary for performing an operation, leads him to the choice of the best methods of executing it, or perhaps furnishes him with the more laudable and happy contrivance of recovering his patient by more gentle means.

Humanity

Humanity is the last qualification mentioned as necessary for a Surgeon ; and though last, not the least important and laudable. This indeed is the cardinal qualification of all ; it reflects a lustre on the rest, and compleats the true character of the man, as well as of the Surgeon. The exercise of it is required in two ways, first, humanity in operation, and secondly, tenderness in our language and behaviour towards the patient. Humanity in operating, should induce us to put an end to our patient's sufferings as soon as we can, and also to perform this severe though necessary task, after such a manner, as shall be attended with the least possible degree of pain. Besides the satisfaction necessarily resulting to ourselves from the consciousness of having been actuated by such motives, it may even be of great consequence to the success of the undertaking, for no one can be ignorant how dangerous to the patient is the inflammation that often succeeds an operation, and it is equally obvious, that a long continuance of sharp pain is very likely to produce or increase it.* Tenderness in our behaviour needs not an argument to enforce its necessity. It is not less honourable to the human than to the professional character ; and surely the distresses of our fellow creatures and the pain we are often obliged to inflict upon them, is sufficient to soften the hardest heart, and to raise the tender emotions of compassion within us ! When we are obliged to arm our hands with steel, shall we likewise steel our hearts, and on our brows wear terrors, if possible, more formidable to the sufferer, than the knife we hold ? On the contrary, let us endeavour, by complacency of aspect, softness of speech,

* In the performance of an operation, the Surgeon should be on his guard, not to hazard the final success of it, through a wish to be expeditious. It has been too common, to estimate the degree of excellence due to an operator, by the number of minutes in which his work has been performed. The wish to acquire a reputation for superior dexterity should have no existence in the mind on such an occasion ; it is a principle dangerous to the patient, though gaining his approbation, equally with that of the spectators, by the speedy end put to his sufferings. But surely this proves a cruel lenity to the one, and a short-lived triumph to the other, if, in the event, it appears that either too much or too little has been done, and if, as too commonly happens, the patient either fails of obtaining the expected cure, or loses a life which a more deliberate operation might have preserved. On these occasions, we should rather be careful not to lose time than anxious to gain it. H.

and

and gentle handling, to sooth the pangs of agony and torture, and let us strive, by persuasive language, to reconcile the patient to his sufferings; this will enable him to submit with patience at least, if not with willingness, to his fate, and bless the friendly hand that inflicts the wound. *Suaviter in modo fortiter in re*, is a maxim we ought always to have in our minds on these trying occasions.

To students in the art of Surgery, no language can too powerfully enforce the necessity of cherishing in their hearts this amiable and, to them, most indispensable virtue.

As students, it is their business to attend the hospitals, where the poor become the immediate objects of their care and management. It is, perhaps not unjustly, considered as the opprobrium of medical men, that they have considerations for the rich, in which the poor are not thought worthy to be sharers. Though youth be "prone to compassion," yet its hasty and inconsiderate sallies are but too apt to break forth in harsh and indignant expressions. But it should be considered, that these unhappy people whom want and disease have driven to seek relief in an hospital, have, on this account, a double claim to the attention and tenderness of those, to whose management their cases are consigned. An hard lot has been their portion in life, and with this additional weight of misery, there is little need to wound their feelings by rough and unqualified language, or by a kind of treatment which tends to depress them yet more with a sense of their dependent and helpless situation. When dressings are either removed or applied it should be done with a gentle hand, and in a manner, which would convince the bystanders that it is not the Surgeon's intention to give pain if he can avoid it.* A contrary conduct may even prove an obstacle to a practitioner's success in life; for, should he use himself to behave harshly and with rudeness to the poor, it is an habit that will en-

* Not less to avoid giving the patient unnecessary pain, than because nature may be counteracted, in her efforts to heal a wound, by a contrary management. I fear this is by no means an uncommon case, having repeatedly seen instances, where, by rough wiping, &c. the progress of cicatrization has been impeded. H.

crease upon him, and at length render his manners coarse and offensive, even to those on whose liberality the emoluments of his future practice may in a great measure depend. To obtain the blessings of the poor, is one way to secure the confidence of the wealthy.

We come now to consider the acquired knowledge necessary to make a good Surgeon. On this point I shall make one general observation, to wit, that the more extensive and universal a man's knowledge is, the better fitted will he be for the exercise of all learned professions as well as of our own. But, not to alarm or discourage young persons by considering the subject too extensively, or by a vain display of science, I will mention only that knowledge which, in my opinion, it is absolutely necessary they should acquire. I am sufficiently convinced, that if they are as conversant as they ought to be in the few particulars I shall propose to their industry and application, the knowledge they will then have attained, cannot but raise a spirit of inquiry in their minds which will lead them to thirst after more.

It is absolutely necessary, before young persons apply themselves to Surgery, that they should have had, in their earliest days, at least a liberal, and in some degree a classical, education. A knowledge of Greek I shall not absolutely insist upon, though no man, who wishes to secure to himself the reputation of learning in any science, can accomplish that end without it. The technical terms in medicine, as well as in most other sciences, are derived from that source; we have a few indeed which are borrowed from the Arabic tongue, among which is the word cataract, a disorder called by the Greeks *υπόχυσις*. But we have before seen that the surgical knowledge of the Arabians was chiefly deduced from the Greeks.

In the Latin language the student ought to be well versed; he may indeed comprehend the principles of the profession without it, but it is in such constant use, and there are so many Latin books daily published, both in our own and in foreign countries, that a knowledge of this language can
scarcely

scarcely be dispensed with. Translations indeed generally appear to supply this deficiency, but there is nothing so satisfactory as the perusal of a book as it comes out of the author's own hands; and besides, it may and often does happen, that works of great merit remain untranslated for a great length of time, so that here a considerable impediment to the acquisition of knowledge may occur to a person ignorant of the Latin tongue.

On the same ground I would recommend a knowledge of the French, sufficient, at least, to enable the pupil to read and understand it. In this and the Latin he will find many principal sources whence information in chirurgical matters may be procured. Some considerable advantages may likewise be reaped from the study of books written in the German language, translations of which have never appeared. Our best and most useful system of Surgery was published in that language in the year 1718: I mean that of HEISTER, which did not appear in Latin till more than twenty years after. The English translation was made from this latter edition, so that those of our countrymen who had the misfortune to be deficient in these respects, were deprived of the information they might have gathered from that excellent work (the only one of the kind extant) during the fourth part of a century.

I would therefore, for these reasons, seriously advise all gentlemen who apply themselves to Surgery, and who are acquainted with none but their native tongue, to acquire a knowledge of other languages; a task they will find by no means difficult, since a *critical* knowledge of them is not required. I only mean to hint the necessity of such a progress as will just enable them to range through foreign fields, as well as through their native meadows, that the choicest flowers of neither may escape their observation*.

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* Doubtless the Author is right in his conclusion that a *critical* knowledge of the languages, whether the dead or living, is not indispensably necessary to be included amongst the qualifications of a good Surgeon. He to whom Homer is unintelligible may yet understand

The next acquisition we shall recommend, is a knowledge of the powers and properties of medicines. The various substances of the *Materia Medica*, the different classes of the vegetable, mineral and animal kingdoms, so far as they relate to physic, supply all the several applications used externally in Surgery. If therefore we are ignorant of the qualities of these substances, we may commit the grossest mistakes in the use of them. Instead of an emollient, we may apply an escharotic, and, instead of a stimulating application, we may perhaps prescribe an anodyne. Without this knowledge, how should we have discovered, that *Sal Armoniac* mixed with Hungary water, dissolves ichirrous tumors in the breast, by the property it possesses of keeping the milk fluid *. Many other similar instances might be adduced, in answer to which, it may possibly be argued, that we should have learned these things equally from experience. If there be any young Surgeons who are disposed to take what they hear for granted, and can sit down satisfied with being told that such and such things are so, without being anxious to inquire into the reasons why they are so; if, when they have it in their power to investigate the true principles upon which the action of any medicine is founded, they neglect the opportunity of being acquainted with them, and, like mere empirics, inattentive to the peculiar habit of their patients, or the variety of appearances so frequent in the same disease in different

Hippocrates; and the ancient authors in Physic and Surgery may be read, even with facility, by men little acquainted with the Latin classics; yet this kind of superficial knowledge is hardly to be held out as sufficient to qualify a young man who would become conspicuous in his profession. H.

* The Author's experience is much to be depended on, but the power of *any* external application to keep the *milk fluid* will be doubted by many, and must be extremely difficult to prove. Amongst that class of saline applications which act by their astringent and corrugating quality, *Sal Armoniac* certainly ranks foremost, and is well adapted to resist indurations in the breasts of women, if applied early, and more especially if assisted by the exhibition of repeated vomits. It is of consequence to pay a very early attention to these tumours, otherwise they get into a state of indolence from which it is extremely difficult to rouse them by any methods known to Surgery. The Hungary water used in the author's practice as a vehicle for *Sal Armoniac* in these cases, can only add to the astringent qualities of the latter. H.

persons,

persons, content themselves with knowing that any one medicine has been used with repeated success in the same case, to such I can only say, that the practice of our profession is very improper for minds so supine and uninquisitive. Nothing can be more necessary therefore than a knowledge of the *materia medica*, and consequently of Pharmacy, which is nothing more than the art of mixing the several articles of the *materia medica*, so as to produce combinations capable of effecting what cannot be done by any solid or fluid substance singly.

The last point I must insist upon being particularly attended to, is the study of Anatomy. The human body, being the subject of our operations, how shall we be able to perform them properly, if we are ignorant of the construction of the machine on which we are to work?

A compleat and thorough knowledge of Anatomy it is absolutely necessary to acquire, and the method to be pursued in order to attain it, must be the work of our own hands. Mere aural instruction is not sufficient; we may attend the most ingenious and instructive lectures in Anatomy, without being fitted for the exercise of our profession.—It is therefore necessary for us to dissect, to trace and inspect the several parts of the human body, with our own hands and eyes; and thus, with care and assiduity, we may get sufficiently acquainted with the structure and formation of the human machine to attempt any operation that Surgery requires. Upon this very essential point a young Surgeon must spare no pains, nor ever let slip an opportunity of dissecting whenever it may accidentally present itself.* Besides the proper anatomical knowledge that cannot but be acquired

* The Author seems to allude to the *difficulty* which young students find in meeting with *opportunities of dissecting*. We may here take occasion to observe, that, although the good of mankind has been so greatly promoted by the improvement of medicine through that of Anatomy, and although the inspection of dead bodies is *yet* so likely to prove of consequence to living ones, (the discoveries hitherto made bearing no proportion to what remains to reward the diligence of future enquirers) the empty prejudices of the vulgar even find a sanction in the opinions of the first legislative assembly in this kingdom, and, from the lips of one of the learned sages of the law, we are instructed, that the dissection of the body after death is an *addition to the punishments*

acquired by this means, he will reap another and very considerable advantage from it, which is, that frequent dissection will make the use of the knife become easy and familiar, so that when he is obliged to apply it upon the living body, it will be done with greater dexterity, and consequently much more to his own satisfaction, as well as to that of the bystanders.

But the study of Anatomy does not stop here; it is an extensive field, which, when diligently explored, opens a prospect comprehending the whole unbounded hemisphere of science. It is not enough that we should know the names, situation, and connection of the several arteries, veins, nerves, muscles, tendons, and other constituent parts of the human frame, we must also learn their respective powers and uses. We must be well versed in the *Physiology* of the machine, for, if we are ignorant of this, how shall we be able to determine, when any of the functions of the animal œconomy are interrupted or destroyed, by contusions, wounds, or other accidents, the particular part on which the injury has fallen? If, for instance, we are ignorant of the action of the Diaphragm in the office of respiration, how can we possibly have any conception of the symptoms attending a wound of that muscle? Physiology therefore is of infinite use to a Surgeon, in indicating the diagnostic signs of the injuries the internal parts may have suffered; and by this he may be led, not only to form his prognostic with judgement and precision, but also to distinguish

punishment inflicted in criminal cases. Much to his honour, a certain active, humane, and intelligent member, brought into the House of Commons, a Bill, one clause of which would have rendered the practice of robbing the graves to supply the demands of the dissecting room no longer necessary; a clause, which gave to the improvement of this important science, the victims of public justice, but which was over-ruled in another place by the grave argument already stated. How shall we reconcile this conduct of the learned Lord with that admirable maxim in the Essay on crimes and punishments, which enjoins, that the law should punish a culprit with the least of real and *the most of seeming severity*?—(see this Essay by the Marquis Beccaria, page 44.) Had not Anatomists laboured under these restraints in the early state of medicine, our knowledge of the human machine and consequently of the diseases to which it is incident, would not have been so limited at this Day. H.

where

where the remedy should be applied, if the case be within the assistance of his art.

Now that we have enumerated the several requisites and accomplishments which constitute a good Surgeon, what shall we think of those persons who have endeavoured to lower the rank of our profession, by asserting that Surgery is a mere mechanical art, and improperly dignified with the appellation of a science? Does then the penetration by which we discover injuries concealed from the senses, does the knowledge which conducts our hands in the nicest operations, does the salutary resolution with which we separate parts otherwise destructive to the whole machine, do all these wonderful assistances, so beneficial in preserving the lives and health of mankind, entitle us only to be ranked among the meanest mechanics? Does the use we make of our hands depreciate the powers of our understanding? Or, are the actions of the body inconsistent with the powers of the mind? Surely no, Surgery and Science are inseparable from each other. It is founded on principles, the application of which, in many instances, demands the utmost sagacity and penetration; and after all, these are no more than elementary principles since the mind which has already assiduously collected and stored itself with these fundamental truths, has then a second task to perform, to wit, the extension of its power in the application of them. Its utmost activity must here be exerted in separating or combining these principles, and adapting them, with a variety of intentions suited to the different circumstances of disease, and the complicated appearances which are liable unexpectedly to occur. Indeed, where nature and not the Surgeon, performs the work, a servile imitation of the practice of others may seem to succeed, and even abscesses, ulcers, and many other chirurgical disorders, may yield to our applications as it were by chance; but, not knowing on what principles these cures take place, we cannot arrogate to ourselves any merit on such occasions.

Since then our art is of so important a nature, and since it requires such an extent and variety of knowledge, we surely have sufficient reason

to reckon it among the sciences; and those who design to make themselves thoroughly masters of it, will even find it a science not to be attained without great labour and perseverance. It is necessary therefore to apply to it earnestly, and with attention, not only because our characters and fortunes are at stake, but because the lives of our fellow creatures are in our hands, and we cannot but shudder to think what destructive consequences may result from our ignorance or neglect. As an additional incitement to our industry, let it farther be remembered, that our operations, being always performed publickly, and the effects of them evident to all present; we are constantly exposed to the censures of malignant and envious characters, who may possibly be disposed to put the worst construction even on our best designs, and seize all occasions that offer, to magnify our most trifling mistakes, and represent all inaccuracies as much to our prejudice as possible. *

* The author might very properly have extended his admonition to another point not unworthy the attention of all descriptions of medical men, but more especially deserving to be inculcated into the minds of those who are *about* to engage in practice. I mean their relative duties towards society and each other, a subject which indeed forms a distinct ground of consideration from that which regards only the direct exercise of chirurgical talents, but which certainly ought to have no inconsiderable share in the completion of a good Surgeon's character. It is to be lamented, that the dissingenuous and unfair arts, which have been found to diminish the importance and blemish the reputation of other learned professions, are sometimes practiced to the extreme degradation and disgrace of our own; and, I fear, it cannot readily be disproved, that those who are thus capable of treating each other illiberally, have, if possible, fewer scruples to preserve their conduct to the community at large, within the strict bounds of honour and rectitude. This being the case, it would have been a valuable addition to these pages, had the author attempted to state the distinction between the way to an honourable pre-eminence in the profession and the too prevalent mode of stealing into public notice by methods which are in themselves unworthy if not disgraceful; which tend to destroy the confidence of the public in all things that concern the profession; and which induced an ingenious, yet sometimes misanthropical writer, to regard the medical art, as practiced in his time, with contempt and abhorrence; to represent physic as a trade, equally destructive to the interests and happiness of mankind; and to insist, that its boasted advantages in relieving the diseases of the body, are only obtained at the expence of all that is salutary to the mind. “Un corps débile,” says M. ROUSSEAU, “affoiblit l'ame. Delà l'empire de la Médecine, art plus pernicieux aux hommes que tous les maux qu'il prétend guérir. Je ne fais, pour moi, de quelle maladie nous guérissent les Médecins, mais je fais qu'ils nous en donnent des bien funestes, la lâcheté, la pusillanimité, la crédulité, la terreur de la mort: s'ils guérissent le corps, ils tuent le courage. Que nous importe qu'ils fassent
marcher

“ marcher des cadavres ?—Ce sont des hommes qu'il nous faut, et l'on n'en voit point sortir
“ de leurs mains.” EMILE, Liv. i. P. 60. These censures, no doubt, too indiscriminately
affect the art and those who practice it ; yet it were well, if a liberal, disinterested and be-
nevolent conduct, in medical men, more directly tended to contradict the truth of these
very severe and pointed animadversions. In a country where Medicine and Surgery are held in
higher estimation than in any other, and where the practice of them meets the most liberal
encouragement, there can be no excuse should they fail to benefit mankind in the most ample
and essential manner. H.

to mention her conduct?—Of late the houses full night but, as I can not yet point out
 "the house number," I have, I. do. These conduct no doubt, the individuality
 of the act and those who practice it; for it were well, if a liberal, disinterested and
 unprejudiced country, in treating men, more liberally tended to contrast the truth of their
 very treatment and political administration. In a country where political and religious
 higher estimation than in any other, and where the practice of them, more the most I have
 experienced, there can be no excuse, though they fail to practice anything in the most proper
 and liberal manner. M.

II.

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ON

INFLAMMATION and ABSCESS.

ONE of the leading principles in Surgery, and that, upon the due application and prudent modification of which, the cure of most chirurgical diseases seems to depend, (exclusive of those which are to be remedied only by extraction or extirpation) is Inflammation. It is a natural principle existing in every human body; a kind of symptom accompanying more or less almost every disease; and which, consequently, if excited to a great degree, may itself become a disease, and dangerous to the machine.

In order to determine what inflammation is, let us lay aside all hypothesis, and confine ourselves only to facts and appearances. Had this been done, I will venture to say, we should not have had so many contending systems, respecting its nature and causes, as have prevailed at all times from the æra of Hippocrates to the present period; systems, the absurdity

furdity of which, is particularly evident from the circumstance of their having been mostly adapted to the favourite study or pursuit of their several inventors. Thus the Chemists made an alembic of the human body, and have imagined the cause of inflammation to be ~~some~~ ^{some} particular ferment, arising from the salt, sulphur, and other chemical principles, in the blood; while the mathematicians, changing this laboratory into a statico-hydraulic machine, have referred inflammation, as well as every other effect or action of the human body, to mechanical principles. These theories of inflammation have likewise confounded it with that of fever which we shall find to be a very erroneous position, for although inflammation may be, and often is the cause of fever, * yet we know from experience that many topical inflammations exist, and of considerable extent, without any sensible change happening in the general circulation. This difference in opinion prevails, even at this day; insomuch that if we examine the doctrines of the several professors, we shall not find any two of them perfectly agreeing in their ideas of inflammation. In this state of uncertainty, let us, without attending to any of these systems, deduce our notions from circumstances that are absolutely evident to our senses.

Inflammation then appears to be an increase of heat, action, and sensibility in a part; accompanied with a greater or less degree of acute pain, a redness, distention, and an unusual pulsation, in the part.

Any cause therefore, whether external or internal, which increases the natural sensibility or irritability of a part, is capable of producing inflammation. We see this effect evidently produced by the stimulus of any irritating external application, such as the bite of a venomous insect, the action of caustic, &c. These stimuli necessarily urge all the smaller vessels of the part to more frequent and powerful contractions, and hence arises the increase of heat, friction and distention, and the derivation of a greater

* There are powerful reasons for denying that the commotion excited in the system, where local inflammation exists, should be considered as Fever. Dr. George Fordyce asserts that "it is not Fever, but a *distinct disease* arising from Inflammation." H

quantity of blood into the vessels of the part. Hence also the pulsation in a part which before did not pulsate. The increase of heat and action in an inflamed part, is generally supposed to imply or include a more rapid circulation in it, which is far from being the case, for this increase of heat and action in a part, may exist, without any increased rapidity of the circulation. I will allow, that a greater quantity of fluids circulates through a part that is inflamed, than through one in a natural state, but they do not circulate with greater or even with so much rapidity. The derivation of a greater mass of fluids, in consequence of the irritation, cannot fail of distending the capillary arteries beyond their usual diameter.

Hence we account for the redness which takes place, and also for the pain. But when the capillary arteries are distended beyond their usual diameter by the accession of more blood into them, it necessarily follows, that the circulation will be impeded in its progress through them, rather than accelerated; the fluids will be accumulated, and, whatever may have been said to the contrary, an *obstruction* will certainly prevail. By obstruction however I do not mean a total stagnation, according to Boerhaave, though that perhaps may sometimes happen; but a tardy or impeded circulation in the part.

Now let us trace the progress of inflammation, and endeavour to account for the remaining symptom sometimes attending it, namely, a general fever in the habit or an increase of pulse.

The progressive motion of the blood being then retarded in the capillary arteries, and that quantity which used to pass at each pulsation, being no longer pushed through them in the same given space of time, a reflux of some of the blood, must consequently happen. This being urged on in a direction counter to that of the circulation, the velocity of the blood in all the parts in which this circumstance obtains, is necessarily retarded, and thus the progress of inflammation is increased, the disease extending gradually to the neighbouring parts, and being continued to a greater or less extent. If this reflux should increase, it will communicate itself
to

to the great vessels; and, constantly opposing a retrograde motion to the fluids which are circulating through them, (or at least a resistance which they are not used to meet with in their progression,) the effects of it will be conveyed through the great vessels as far as the left ventricle of the heart. This ventricle, being then somewhat overloaded by the reflux of the blood, which has been conveyed to it, and partaking also of the increased irritability of the nervous and arterial system, will be stimulated to more frequent contractions; these contractions will become more violent, the heat will increase, and a general symptomatic fever will prevail.

This idea of the reflux or retrograde motion of the fluids, is by no means imaginary; exclusive of the probability of its existence from analogy, in the inversion of the peristaltic motion of the intestines, which is also the effect of stimulus, it is confirmed by a very curious experiment of that accurate observer, Lewenhoeck. That Philosopher examined with a microscope, in a Bat half-dead with cold and hunger, that fine and delicate membrane which performs the office of wings in this animal. He perceived at first no motion in it, but five or six hours after, when the Bat had been recovered by warmth, he saw, with the assistance of a microscope, in an artery, some globules of stagnated blood, which, by the oscillations of the artery, went backwards and forwards, sometimes retrograding and sometimes advancing in these vessels, till they were sufficiently attenuated to pass through them.

This Theory of Inflammation, independent of any other hypothesis, though connected with some parts of most of the systems that have been formed, appears to me simple, and is deduced from and supported by facts, which, of themselves, seem sufficient to account for all the phenomena that require explanation.*

* The reader is left to make his own comments on this Theory of Inflammation, from which many will be disposed to differ, and for different reasons. It is a question whether, either in point of argument or of fact, it will be thought sufficient to invalidate the generally received opinions on this subject. H.

Let us now proceed to consider the different modes in which Inflammation terminates.

Inflammation is said to terminate in five different ways ; by resolution, by suppuration, by adhesion, by schirrus, and by gangrene. Inflammation terminates by *resolution* when it either goes off spontaneously, or yields to the means employed by art to get the better of it, or when it is removed from one part, by an inflammation being excited in another. The first is simple resolution ; the second, resolution by evacuations ; the third, resolution by metastasis. As the second mode of resolution is the one in which our art is chiefly concerned, we shall describe the manner of effecting it when we speak of the treatment proper for inflammation.

Inflammation is said to terminate by *suppuration*, when, the means to procure resolution having failed, the disorder increases in violence, the bulk of the part then becomes more considerable, and a more evidently circumscribed red tumour is formed, in which, upon handling, we manifestly feel a fluctuation, indicating the existence of some fluid within. This tumour is then what Surgeons distinguish by the name of abscess, or imposthumation, and the fluid contained in it is distinguished by the name of pus or matter ; of the nature and formation of which we shall treat when we consider the doctrine of abscesses.

The third termination of inflammation, namely, by *adhesion*, is when two inflamed or suppurating surfaces, are by any means brought into contact with each other, in consequence of which a connection or adhesion is formed between them. This adhesion may take place either with suppuration or without it ; in the cure of the Hydrocele, for instance, by seton and by caustic, we sometimes see the inflammation excited by the former, merely to such a degree as to bring on an adhesion without any destruction of parts. This indeed is the principle upon which the seton has been recommended, and when the inflammation goes beyond this, or proceeds to form suppuration, it fails in its intent. In the cure by caustic this adhesion is brought about by the suppuration of the whole sac of the

tunica vaginalis, (and consequently the obliteration of its cavity,) and the subsequent adhesion formed between the inflamed or suppurating surfaces of the albuginea, and the cellular membrane of the scrotum.* The former kind of adhesion between inflamed surfaces without ulceration or suppuration, is also made by the transudation, or extravasation of the coagulable lymph. This is the case in those adhesions that are formed between the Pleura and the Lungs.

Inflammation is said to terminate in *schirrus*, when the obstruction in the vessels remains, after the inflammation has gone off either by resolution or suppuration. So, in glands, where the obstruction is double, namely, in the capillary arteries, and in the lymphatics, we often see that the suppuration is only partial, and that a slow indolent tumour remains, which, unless a fresh inflammation and suppuration can be excited, will terminate in a *schirrus*. But if by termination we are to understand, as most writers who mention this subject seem to do, that inflammation is the cause of *schirrus* in the same manner as it is the cause of suppuration, we shall perhaps find their conclusion erroneous. To illustrate the matter however, let us take a review of the progress and appearances of a *schirrus*.

A *schirrus* is, ab origine, an induration and enlargement of some of the glands of the body. This induration takes place without any of the concomitant symptoms except obstruction. But obstruction alone, without other symptoms, is not the character of inflammation. It is, to all

* The author seems here to have given too hastily into the late Mr. ELSE's first idea of the mode in which the cure of Hydrocele by caustic takes place. I have been favoured by my friend Mr. CLINE with an opportunity of examining several preparations, in the collection at St. THOMAS'S HOSPITAL, which put it beyond dispute that the *whole* of the Tunica Vaginalis is *not* thrown off by suppuration. Indeed, notwithstanding the warmth with which Mr. Else defended this method of cure against the attacks of a very able antagonist, he is said in the latter part of his life to have relaxed in this particular point, and at length to have admitted, that the cure might, and frequently did take place, by mere adhesion of the sides of the Cyst, the sloughing of the Tunica Vaginalis being rather an accidental than a necessary circumstance. H

intents and purposes, an obstruction or filling up of the vessels in the gland without any other of the signs of inflammation, and this is so evident, that enlarged glands will frequently subsist for years, and sometimes during life, in a perfectly harmless and indolent state, unless some irritating power sets the morbid principle, dormant within them, into action. So far then from the inflammation causing the schirrus, it is rather to be suspected, that the schirrus precedes the inflammation. In some instances therefore, where an inflammation and subsequent suppuration take place in an indurated gland, this inflammation is nothing more than an effort of nature to get rid of the disease. If this effort prove successful, the whole gland falls into a laudable state of suppuration, and the disease is cured. But if, on the contrary, the morbid principle, or obstruction without inflammation, prevails in the gland in opposition to this inflammation or effort of nature to get rid of it, the schirrus is confirmed.

Inflammation is said to terminate in *gangrene*, when the inflammation, as it were subsiding, the disposition to gangrene prevails over it; for here again, as in the schirrus, the inflammation can scarcely be deemed the cause of the gangrene, since, as in the preceding case, the latter often exists before the former, and the former is also an effort of nature to overcome the latter.

For the better illustration of this, let us suppose a considerable injury to have been done to the soft and hard parts of a limb, by a very great act of external violence. Let us farther suppose, that the immediate effect of this stroke shall be a gangrene, a sphacelus, or total loss of life in some of the parts affected. This we frequently see in large lacerations of the skin, where the torn piece, though still connected with the sound parts in some points of contact, yet is itself so much affected by the bruise, that it shall be entirely deprived of life, so as that it shall not be able to recover itself but must be separated from the sound parts. This separation can only be accomplished by an inflammation and consequent suppuration being excited. So in all gangrenes, it may readily be ad-

mitted, that the putrid disposition or tendency to dissolution first prevails in the part, and that the inflammation is a subsequent exertion of the powers of nature to prevail over the disease. If this attempt be successful the gangrened part is separated from the sound; if not, the disease gains ground, till a compleat Sphacelus brings on the dissolution of the patient. This is particularly exemplified in that species of mortification which is called the dry gangrene, which we often see attacking the extremities of old people. Here there is no inflammation, but, on the contrary, a debility and want of heat in the part, from a tardy circulation brought on by the ossification of the arteries* or other causes. Neither can it be said that the great pain, which these patients suffer previous to the appearance of the gangrene, is a proof of a pre-existing inflammation; for pain is but one sign of inflammation, the existence of many other symptoms being requisite to characterise this disease. We may also observe, that the pain in these cases is of a kind very different from the throbbing pulsating pain of inflammation. It is a pain which seems to be excited, as it were, by the violent commotion raised in the whole frame, from the struggle between the life and death of the part, and may not improperly be compared to that conflict in the human body which precedes a separation of the animal from the sensitive principle. Besides, this pain can only be relieved by a free use of the strongest wines and most generous cordials, and by excessive doses of that highest of all cordials, Opium; all means which would increase the pain of inflammation†.

Indeed whenever a gangrenous disposition seizes a part, there seems to be a perpetual struggle between that and the inflammatory disposition. The

* MR. POTT will not allow that this species of mortification is occasioned by the *ossification of the arteries*; and what few opportunities I have had of examining these parts by dissection, have disposed me to agree with him. Were the opinion well-founded, nothing certainly could be more demonstrable. H.

† May we not call in question the propriety of the Author's drawing arguments from the progress of a species of mortification which Mr. Pott alledges is "a disease sui generis," when treating on inflammation in a general way? H.

latter endeavours to increase the living principle or vital powers of the part, and either to put a stop to the progress of the gangrenous disposition, or to throw off, from the rest of the machine, those parts that are totally affected with it; the former opposing its destructive and dissolving tendency, to the vivifying powers of inflammation. Nor can it be urged against this doctrine, that the more heat is increased in animal substances the greater is their tendency to putrefaction, and consequently that the increase of heat which we have laid down as existing in an inflamed part has the same tendency: for this effect of heat is applicable only to animal substances when deprived of the living principle. Now the living principle is increased in an inflamed part, by the greater afflux of those vivifying fluids which convey and contain it; so that, in which ever way the matter be considered, the living principle must first be destroyed before gangrene or putrescency can take place. I am aware too, that the extreme degrees of heat and cold, produce effects very analogous to each other; but if this circumstance be admitted as an objection to the doctrine here laid down, we shall confound the heat of fire with that of inflammation, which are extremely different in their nature, for the one destroys the living principle while the other increases it; nor can it be said with any propriety, that a man who is burnt to death, dies of an inflammation.

We now proceed to consider the varieties of inflammation; and, in this view, a twofold division has been made of them, by all writers, into phlegmonous and erysipelatous. A division however, which may be considered as totally improper, because the phlegmon is in reality the only true inflammation. Erysipelas, although it has some symptoms in common with the phlegmon, such as redness and acute pain, yet is in fact a disease totally distinct from the latter; so much so, that, in general, it not only requires a different, but even a totally opposite treatment.

The characters of a phlegmonous, or true inflammation, are strongly marked in our general description of inflammation; to which we may add,

add, that the red colour is very deep, the heat very great, the tumour manifestly circumscribed, and the pulse frequently much raised. In the erysipelatous inflammation, as it is called, the redness is not near so deep, and the skin inclines to a yellowish hue; the pain is sometimes more acute, but of a different kind; not that throbbing pulsating pain, as has before been observed, but a constant, teizing, and acute sensation. There is no kind of circumscribed tumour, nor does the skin resist the touch as in the former case, but, on the contray, pits upon pressure, and presently rises up again, so that an œdema almost always exists. Ophthalmies are mostly inflammations of this kind, and accordingly, we often see them accompanied with an œdema of the eye-lids.

These two diseases then, it is evident, are very different in their nature. The erysipelas seems indeed to be a putrid and not an inflammatory disease, and as we have termed the phlegmon the *true*, so we may properly enough term this the *spurious* inflammation. It seems to arise from a natural debility in the part, and we may account for the sharp and intolerable pain, sometimes attending it, from the effects of increased irritability, which are always most sensibly felt in proportion as that is greater. Thus, we see also, that weak and relaxed habits of body are always the most irritable.

As the disease is different, so are its terminations; for, the five terminations of inflammation mentioned above, refer only to phlegmon.

The erysipelas may terminate in four ways, namely, by resolution, by œdema, by ulceration, and by gangrene. An œdematous state of a limb often succeeds an erysipelas, and the patient is frequently troubled with it more or less through life. Ulceration likewise is a frequent consequence of it; and these ulcers are as difficult of cure as the disease itself, discharging in general, a thin, ferous ichor, which is frequently of so acrimonious a nature, as to corrode the neighbouring parts, and bring on fresh ulcers. We have instances of these erysipelatous ulcerations in chilblains and kibed-heels. The termination of the erysipelas by gangrene is natural to it, since it is a putrid disease, or with a putrid tendency at least.

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The first thing to be attempted in all inflammations is their resolution. In the phlegmonous inflammation, this intention may be answered by bleeding, by warm relaxing means, by emollient, sedative, anodyne applications, and by evacuations. With respect to bleeding, it should not be used too largely and indiscriminately even in the phlegmonous inflammation. Indeed we should always regulate both the quantity and the repetition of it, by a careful attention to the state of the pulse; otherwise, by debilitating the system too much, we may change the disease from an inflammatory disposition in the part to a putrid one; and we shall find it difficult, after that, to recall the inflammatory disposition again, however we may desire and think it necessary.

Bleeding is of two kinds, either general or topical; general, when the blood is drawn from the system; topical, when it is taken from the vessels of the part. Bleeding from the system may either be, by venæsection or phlebotomy, or by arteriotomy. Arteriotomy is confined to the opening of the temporal artery, and is particularly calculated for the cure of inflammations attacking the head or eyes, provided they be of the phlegmonous kind. Thus, in ophthalmies threatening suppuration within the cornea, nothing will more effectually tend to prevent this mischief than opening the temporal artery.* Topical bleeding is likewise of two kinds, to wit, by leeches, and by cupping. Leeches are applied to an

* It is very certain that *bleeding from the temporal artery*, in diseases that immediately affect the head, is to be preferred to venæsection; yet we seldom see it very effectually performed, owing to the minuteness of the ramifications of the vessel, their remote situation from the surface, the difficulty of making an orifice in a favourable direction, and (as is usually done in opening a vein) by a *single puncture*.—As this practice is of no small importance, being calculated to afford relief in cases of extreme danger, as in Phrenitis, Apoplexy, apparent death by suffocation, &c. it were to be wished that the performance of arteriotomy were cleared of these difficulties and rendered more familiar to practitioners. Although many writers have insisted on its good effects in a variety of diseases, yet few attempts have been made either to render it more acceptable to the mind of the patient, or more commodious to the hand of the operator; the former associating the idea of danger with the opening of an artery, and the latter feeling a want of confidence as to the event of the undertaking. In a dissertation by

an inflamed part frequently with advantage, and cupping glasses to the neighbouring parts are also of service. This kind of topical bleeding is often

DR. BUTTER, ON AN IMPROVED METHOD OF OPENING ARTERIES, we have the following judicious directions for the performance of the operation.

1. "The patient being conveniently placed to the light, the operator sits down fronting the side which he intends to operate upon, shaves the temple, wipes it very dry, and then rubs it over with powder of chalk."

2. "Having discovered the artery, by its pulsation under his finger, and made a dot with ink on each side of it, (about the same height with the top of the ear) so as to leave the distance of one half or three fourths of an inch between them, he directs the patient's head to be held by an assistant."

3. "Then pinching up the skin with his finger and thumb below where he intends the incision, while the assistant does the same above, he runs the lancet through the two mentioned dots, and cuts the skin over it quite through."

4. "The operator next compresses the artery with his left thumb a little farther up than the wound; wipes the wound with a bit of sponge wrung out of cold water; and, having thus got a distinct view of the artery, opens it in a longitudinal direction, and with an elevation of the point of his lancet."

5. "Having drawn the proper quantity of blood, he brings the lips of the wound together, applies two or three folds of charpee to it, and fixes the bandage upon that; but so, that the pulsation may be felt equally free through the ramifications of the temporal artery after, as before, the application of the bandage."

Timid patients generally feel great reluctance in submitting to a second stroke with the lancet; but as, in attempting arteriotomy in the common way, this generally proves to be necessary, it is certainly better to secure the opportunity of making a fair and effectual opening by the methods recommended above. With regard however to the direction in which the incision is proposed, I cannot help differing from the author, since an orifice, strictly *longitudinal with respect to the artery*, has a less chance of giving a free vent to the blood than one that is made *obliquely*. This is very observable in opening a vein, where the incision, if made exactly in a longitudinal direction, is required to be far more extensive than if made obliquely. It must be allowed indeed that the pulsation of an artery has a continual power of distending the orifice, a circumstance that does not obtain in venæsection; yet, as the great objection to the operation here considered, exists in the difficulty of drawing blood in *suffici-*

often very effectual, and as it does not weaken the system so much as general bleeding, it may be used almost in every kind of inflammation, the erysipelatous not excepted ;* whereas, in this last kind, all bleeding from the system should be carefully avoided. Indeed, as bleeding from the system is always to be determined by the state of the pulse, if we attend to this rule, we shall never find bleeding necessary in the erysipelas ; for the pulse in such cases is usually languid and low. In the erysipelas which attacks the head and face, and which is accompanied with a great

ant quantity, it is highly necessary we should avail ourselves of every advantage that the case will admit of. H.

* The author, in allowing the application of leeches to a part affected with erysipelatous inflammation, will be thought to have differed from what is the general practice. It is worth considering, in the first place, whether, if unattended with subsequent inconveniences, this remedy can be employed with the same probability of advantage as in a case of phlegmon ; and, secondly, reference should be had to facts for information, how far the orifices made by leeches are or are not liable to degenerate into troublesome ulcers, as has been commonly alledged. Excellent as this remedy has proved in the true inflammation, there is reason to consider it not only as a very doubtful one as to its immediate good effects in allaying erysipelatous inflammation, but also as being somewhat hazardous with regard to future consequences. If however, we admit the possibility of a mixture of the phlegmonous and erysipelatous dispositions, which, though somewhat incompatible with our author's general doctrine, seems in part to be acknowledged by the caution he recommends respecting the change from one state to the other, (see p. 79, l. 8,) we may account for the beneficial effects that in some instances have succeeded the application of leeches, by the circumstance of their having diminished the tendency to phlegmon. The ancients chiefly confined the true erysipelas to the skin, and considered as an evidence of its intermixture with phlegmon, the swelling and sense of throbbing in the "circumjacent flesh." GALEN, in the following passage, states the distinctions made by the Physicians of his time ; which, it seems, were deduced from the predominance of one of the two species of Inflammation over the other.—"Quemadmodum id, quod subjectam carnem attingit, neque ex tenui omnino fluxione fit, non solum erysipelas est, sed mixtus affectus ex erysipelate et phlegmone: in quo quandoque propria erysipelatis symptomata prævalent, et a recentioribus medicis vocatur talis affectus erysipelas phlegmonodes ; quandoque autem phlegmones, et dicitur ideo phlegmon erysipelatodes. Quod si neutrius (symptomata) evidenter prævalent, sed æqualia videantur, phlegmonem et erysipelas mixta esse dicuntur." — In the use of topical bleeding, it should seem most advisable, to be guided by an attention to these circumstances. The more evidently we see distinct marks of erysipelas, whether locally or by symptoms affecting the constitution, the less shall we be justified in having recourse to evacuations of any kind. H.

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puffiness

puffiness or œdema of the whole countenance, one single venæsection will bring on a delirium and the death of the patient*. By the way, it may be proper to observe, that, in this particular species of erysipelas, though the patient usually complains of great heat and burning in the face, yet the pulse is generally very languid, and it is absolutely necessary carefully to avoid using any cooling or astringent application; for, an error in this respect, will infallibly bring on phrenitis. Perhaps it would be best to use no topical application whatever in this case, or, if any, none but of the mildest and most innocent kind, such as warm milk and water, merely by way of a wash. This disease, indeed, is more the province of the physician than of the surgeon, for it is to be treated only by internal medicines: these should be gently warm diaphoretics, with a free use of warm, diluting liquors. Towards the end of the disease, moderate evacuation, by gentle purging, is useful†. This disease, when properly treated, is not attended with any bad consequences, and generally goes off in a few days; but when improperly treated, is almost always fatal. If any error of practice shall have been unwarily committed in the first instance, the best way to rectify it is, to endeavour to remove the stimulus from the brain, by setting up an artificial stimulus in other parts.

* This is so diametrically opposite to the ideas of Dr. CULLEN, that I think it highly necessary to transcribe the following passages from his PRACTICE OF PHYSIC, Book III. Chap. I.—“The *erysipelas of the face* “says he” is to be cured very much in the same manner as “*phlegmonic inflammations*, by blood-letting, cooling purgatives, and by employing *every part of the antiphlogistic regimen*; and our experience has confirmed the fitness of this method of cure.—The evacuations of *blood-letting and purging* are to be employed *more or less* according “to the urgency of the symptoms, particularly those of the Pyrexia, and those which mark “an affection of the brain. As the Pyrexia continues and often encreases with the inflammation of the face; so the evacuations mentioned may be employed *at any time* in the “course of the disease.” H.

† I confess I am inclined to prefer purging, whenever thought expedient, at the *commencement* of the disease rather than at a later period. In many instances within my knowledge, mercurius dulcis sublimatus, given with this intention, has proved singularly serviceable. In treating a disease where weakening the patient is to be avoided, purges of that class which act by encreasing the peristaltic motion of the intestines, rather than those that augment their secretions, seem to deserve a preference. H.

This

This is only to be done by the repeated application of blisters, at the same time that we should endeavour, by the most powerful remedies, to induce a diaphoresis on the skin; and thus, if possible, procure a solution by metastasis, when simple resolution fails*.

The next intention considered as necessary to be attended to in procuring the resolution of phlegmonous inflammation, was the use of warm, relaxing means. This is to be attempted both by external and internal remedies: the internal are the free use of warm diluting liquors, assisted with such medicines as tend to keep up a gentle diaphoresis or moisture on the skin. Relaxation is to be procured externally by fomentations made with the common fatus of the London Pharmacopœia, or by plunging the part into warm water, and keeping it there for some time. Warm water itself is, perhaps, as powerful in forwarding this indication, as any other topic; and if persons seized with slight inflammations, instead of having recourse to a bread and milk poultice in the first instance, as they usually do, were to soak the part for half an hour or an hour in warm water, they would often immediately get rid of an inflammation, which, by a contrary treatment, frequently goes on to suppuration. It must, indeed, be evident, from the account we have given of inflammation, that nothing can act more powerfully against it than warm water; for, as we have supposed the existence of an obstruction to the circulation and progressive motion of the blood in every inflamed part, the continued use of this relaxing application, by taking off from the rigidity and tension of the vessels, will at least enable them to yield more readily, and with less pain, to the distending fluids, and consequently promote a more free circulation through the part, a circumstance which will most effectually remove the complaint by acting against the very cause of it. I have joined warmth with relaxation, because warmth gives a gentle stimulus which greatly assists the intention.

* This little digression upon a disease which, though immediately connected with the present subject, seems to be rather out of our province, will probably merit the reader's excuse, since the observations made upon it are deduced from facts and observation, and may possibly prove practically useful.

Warmth and moisture may also be communicated in the form of vapour or steam to parts which cannot be plunged into water; such, for instance, as the head, face, or neck; and although I am sensible of the superior efficacy of steam to that of any other mode of applying warm water under some particular circumstances of disease, yet, for the purpose of procuring the resolution of inflammation, I know not, on the whole, any method so useful as long-continued immersion.

As, in these cases, there is nothing preferable to the use of partial warm bathing, so, in inflammations of the trunk, there is no remedy so useful as universal warm bathing. But, the conveniencies for a warm bath not being always at hand, while they are getting ready, it will be proper not to neglect the topical application of warm water, either by fomentation or by steam; for a great deal depends upon the *early* use of this important mode of relief. I have frequently seen an approaching inflammation stopped short in its first advances, and when the existence of it was only indicated by the pain, distension, and throbbing of the part*.

The

* In cases where the necessity for *general warm bathing* has not been very urgent, or where the preparations for it have been peculiarly inconvenient or impracticable, very commendable effects have resulted from the use of that ingenious contrivance of Mr. MUDGE, which he calls an *INHALER*; an instrument, easy, and requiring little or no delay, in its application.—In any case when *the full powers of steam* are required *topically*, there is scarcely any mode of application superior to that somewhat inelegant one of a brick heated nearly red and gradually quenched with boiling water. A considerable quantity of moisture being, in this process, drank in by the brick, it is afterwards forcibly breathed through two or three wrappings of flannel upon the inflamed part, the patient regulating the closer or more distant application of it by his own feelings. A brick, however, being not only awkward and unmanageable, but of a shape ill adapted for approximation with the body, a piece of the same kind of clay, formed without any sharp edges or angles, of an oval shape, somewhat bent, and afterwards burnt in the kiln, would probably prove more suitable for the purpose. Another remedy more pleasant though less efficacious in local inflammations, may be had in the application of a bladder filled with hot water; but, to be of any material service, this should be applied without any intervening substance, (since the moisture communicated through the bladder is very inconsiderable) and here it is impossible that the degree of heat can be at all uniform. If the whole be no more than sufficiently hot to be of service when first applied, its virtue will diminish from that instant; if it be hotter than necessary, the patient, of course, cannot bear

The third mode to be adopted in endeavouring to procure the resolution of an inflammation, is the use of emollient, anodyne, sedative, and even what are called discutient applications.

If we consult some chirurgical writers upon this point, we shall find such an infinite number of remedies proposed, and those of so opposite a nature, that it will be a difficult matter for us to make our choice; while others, on the contrary, treating all inflammations alike, have but one sovereign topic for them all, which is, a poultice of bread and milk, with the addition of oil or hog's lard.

If, however, we submit to be guided by experience, we shall find that the necessary topics for resolving inflammations are reduced to a very few, and that these must be varied only according to the nature, the degree, and the state of the disease. If we pursue the fore-mentioned indication of endeavouring to discuss the inflammation by warmth and relaxation, which by the way I think best adapted to the early stage of the disease, we must be consistent with ourselves, and join an emollient with a sedative application. The very worst of emollients is the bread and milk poultice, not only on account of the oil with which it is always mixed to preserve its fluidity, (for oil increases, in general, the pain of inflammation) but also, because it is a nasty composition, constantly turning sour upon the part when it has lain on for a few hours. The best emollient we have is linseed, in which, and the preparations of lead, we are able to compound a very good sedative and emollient at the same time. A poultice therefore, made of the Goulard water and linseed cake, is perhaps as good an emollient and sedative application as any we can use; only one thing should be attended to, which is, that the Goulard extract employed to

bear it. The chief defect in this remedy, to wit, the want of moisture, may, however, be compensated in some degree, by first applying to the part a cloth wrung out of hot water, and then the bladder over all.—These powerful kinds of fomentation are, indeed, most frequently directed by Physicians, in cases of spasm or inflammation of the Viscera of the Abdomen or Thorax; but, under proper regulation, their use in all external inflammations may be rendered fully equal to that of any other remedy with which surgeons are acquainted. H.

make

make the water, should be mixed with spirit of wine and camphor instead of brandy *. The sedative power of the application will be much increased by the addition of camphor, which is the most powerful sedative in nature, as we shall have occasion to shew hereafter †.

If, notwithstanding the use of these relaxing, emollient, and sedative means, the inflammation should not only still persist, but should also extend, become more intense and painful, and if no absolute symptoms of approaching or existent suppuration should yet have appeared, we must alter our mode of practice, and totally lay aside the relaxing and emollient plan, in order to substitute one more powerful and efficacious: for, we may observe, that if this plan does not succeed in the first instance, the disorder will frequently be increased by persisting in it; and this is what was meant by the hint already given concerning the necessity of adapting our remedies to the various stages and circumstances of the disease ‡.

* Camphor is certainly a most useful addition to the preparations of lead, *in many cases*. It may not be unnecessary to observe, respecting the mode of mixing it, that the extract and the camphorated spirit of wine should be first put together before the water is added, otherwise a decomposition will happen. I suspect however, that camphor is more useful where a *perfect suppuration* is desired, than in cases where it is to be prevented. Much indeed depends upon the *proportion* of camphor employed; its proving a sedative or a stimulant seeming wholly to depend on that circumstance. H.

† The author has omitted to particularise the *anodyne* relaxants, to which he just now alluded. They are certainly of importance, and have often been attended with effects, equal, if not superior, to the remedy he has so strenuously recommended above. A strong decoction of poppy heads, first employed as a fomentation, and afterwards formed into a cataplasm of sufficient thickness with crumb of bread, not only tends to diminish inflammation, but also to abate pain, and is an admirable remedy. H.

‡ I confess I should be inclined, in treating a phlegmonous inflammation, to reverse the author's plan, and to try the class of cold applications first. When these have been fruitlessly employed, the use of emollients and poultices seems to occur more naturally; their soothing and relaxing qualities being particularly well suited to accompany inflammation in its progress towards suppuration. The author calls the cold remedies "more powerful and efficacious"—surely that is a sufficient reason why they should be had recourse to in the first instance. H.

In this state of phlegmonous inflammation then, we must have recourse to the most refrigerating, astringent, and anodyne applications that the materia medica will supply. And we shall find these properties, for the most part, united in the same topics. Vinegar, either alone or mixed with water, in which case it is called oxycrate; solutions of sal ammoniacum, or nitre, in an aqueous menstruum; or, the aqua ammoniæ acetatæ, which is analogous to the solution of sal ammoniacum; and lastly, spirit of wine strongly impregnated with camphor. For an anodyne, the tinctura opii, or else opium dissolved in any of these menstrua. Of all these applications none are preferable to the aqua ammoniæ acetatæ, with the tinctura opii, or the solution of sal ammoniacum in water, and opium dissolved in it*. The spirit of wine impregnated with camphor, is an application well adapted to some particular inflammations, as we shall see hereafter.

All these topics, from their several properties, are wonderfully suited to counteract all the principles and symptoms of inflammation as we have described them. And first, as we have determined one of the symptoms of inflammation to be an increase of heat in the part, it is manifest that nothing can tend so much to allay this heat as the constant application of a cooling medium: in this light, no remedy in the whole materia medica can be near so powerful as the solution of sal ammoniacum; for, in the midst of the hottest day of summer, and in a room exposed to the ardour of the meridian heat, by joining a quantity of sal ammoniacum with water, the mixture will be reduced to a degree of coldness below the freezing point; neither will this effect be evident in near so great a degree on immersing the bulb of the thermometer into a similar solution prepared with salt of nitre. Secondly, a distention of the vessels of the inflamed part beyond their ordinary diameter being another cause or symptom of

* This last is preferable in Hospital practice, as being much the cheapest. The proportions of the former are, an ounce and a half of aqua ammoniæ acetatæ to half an ounce of the tinctura opii; of the latter, two ounces of sal ammoniacum to six ounces of water, in which we may dissolve from half a drachm to two scruples of opium.

inflammation, these refrigerating topics, by their astringency (which is always a property of cold) tend not only, by bracing the vessels of the part, to enable them better to resist the impetus of the distending fluids, but also by restoring, in some degree, the tone they had lost in consequence of that preternatural distention, enable them likewise to assist in propelling the fluids onwards, and consequently to overcome that impediment to the free progressive circulation of the blood which we have shewn to be a concomitant or necessary symptom of the too great influx and accumulation of fluids in an inflamed and distended part. Opium, as an anodyne topic, joined to the cooling and astringent lotions, is principally intended to alleviate the pain that always accompanies inflammation. It has been doubted indeed by some, whether the external application of opium has really the property of alleviating pain, as is the case when internally administered; but repeated experience has fully established the truth of this fact, and it is likewise farther confirmed by the well-known advantage which arises from the mixture of opium with caustics when applied with the surgical intention of making an opening in any part*. Neither is the failure, in some instances, of the external application of opium to alleviate pain, to be admitted as an argument on this head; because particular exceptions can never invalidate any general fact whatever. The same sort of reasoning might be applied to every remedy made use of in every disorder; for no mode of relief can be successful in every individual instance; but this is still no reason for calling in question its efficacy in a general way.

* The well-known experiment in which the hinder extremities of a frog became paralytic and insensible to the action of mechanical stimuli in consequence of a solution of opium having been gradually dropped upon them, seems very strongly to favour the general opinion concerning opium as a topic. Indeed it is extremely natural to suppose, that the nerves on the surface of the body are capable of being thus acted upon, since those of the stomach are so susceptible of the operation of narcotic substances as to induce a state of insensibility to pain in any distant part.—Where opium is employed under this idea, the *internal* use of it seems as likely to answer the end as any other, and is, perhaps, the most effectual way of rendering the application of a caustic easy to the patient. H.

The

The method of applying these topics, is to take pieces of soft rag, three or four times double in order that they may retain the moisture longer, and to apply them wringing wet to all the inflamed surface. As soon as the rags begin to dry, they are to be wetted again, either by dipping them into the liquid, or by soaking them with a piece of sponge fit for the purpose. The oftener this is done the better; for, however cold any topic may be when applied to an inflamed surface, it soon loses that property and partakes of the heat of the part, and therefore ceases to act as a refrigerant. The cold principle must therefore be incessantly renewed in order that it may counteract the hot one. This is particularly evident, when, having burnt or scalded a finger, we dip it into spirit of wine and camphor, which we know is a certain method of relieving the inflammation in this case, and frequently of preventing the cuticle from rising into a blister. The cold feel of the spirit of wine is extremely comfortable at first, but if the finger be kept in it for any length of time, the fluid soon grows as hot as the part, and therefore ceases to act as a cooler, so that the pain arising from the heat comes on again, and in order to relieve it we shall be obliged to change the hot spirit for some that is cold; thus shifting the fluid from time to time till the purpose be completely answered*.

It

* The employment of *spirit of wine* in these cases, may be rendered much more effectual, by availing ourselves of its power of producing cold by *evaporation*. Thus, instead of immersing the scalded part in Spirit of Wine and Camphor, which perhaps is only equal in effect to a quantity of water of the like temperature, it would doubtless be better if the part were now and then wetted with, or occasionally dipped into it, and afterwards exposed to a current of air, so as to occasion a quick evaporation. The cold thus produced, would probably do more in allaying the violent symptoms which succeed accidents of this nature, than could be expected from the *medicinal* properties of any common application. It is plain however that the author means to consider the *action of cold* as having some share in these advantages; and this affords me an opportunity of mentioning a mode of applying it, which, in several instances that I have witnessed, has answered uncommonly well. This is nothing more than to keep the scalded part *for a length of time* in a large vessel of *cold spring water*. I have seen an instance, where the whole leg having been dreadfully scalded, the pain has presently been alleviated by the use of this simple remedy only, and the patient has recovered in two or three days from the consequences of an accident, which, under a different management, would have confined him perhaps as many weeks. Even in *burns*, where there is an absolute de-

It may perhaps be urged that the free use of these cooling and astringent remedies, in the height of an inflammation which is perhaps tending to suppuration, may improperly check nature in her progress, and thus bring on some fatal disease. To this I answer, that when once the process of suppuration is fairly begun, it does not seem to be in the power of man to put a stop to it, or even to check it by any topic whatever. The inflammation will still go on to its termination by suppuration, notwithstanding all our efforts to prevent it. Indeed it is an observation made long ago, by our sagacious and accurate countryman Wiseman, that the strongest discutients sometimes bring on suppuration; which in fact means nothing more, than that the process of suppuration will continue notwithstanding the application of the most powerful discutients. Since therefore the process of suppuration cannot be checked by any artificial means, when nature is bent upon it, or when it is once begun, there can be no danger in using such topics as I have insisted upon to be most effectual in conquering inflammation; were it otherwise, the attempt to cure inflammations by resolution ought never to be made, but they ought all if possible to be forwarded to suppuration.

Though it has been laid down as a rule, that we should always endeavour to cure inflammations by resolution if possible, yet there is certainly one grand exception to this general doctrine, when, at least, the application of cold to an inflamed part should be carefully avoided. This is, in all instances where, after a long fever or other acute disease in the habit, a *critical* inflammation shall take place.

This however is a circumstance very readily known by inquiring into the cause of the inflammation, and into the patient's state of body, which

frustration of parts, these methods should be taken, since there are none that can be more immediately had recourse to, or that are more capable of affording present ease to the patient. When persons are terribly burnt by having their cloaths set on fire, or from other like accidents, it should seem the most rational mode of treatment to oppose the rapid progress of inflammation by keeping the whole body in a cold bath, instead of trusting to oily applications, which, far from being of service, are absolutely detrimental. H.

should

should always be done previous to our treatment of any complaint. Besides, there is a peculiar character belonging to this critical inflammation. Though it be of the phlegmonous kind, yet the symptoms are not so rapid, nor so violent, as in other phlegmonous inflammations. The inflammation seldom appears outwardly on the skin, but is generally begun in the deeper seated parts, where the sensibility and irritability are not near so great as in the skin. The constitution being much worn out and exhausted by the disease, has scarcely power enough left to excite, in the part, a sufficient degree of action to bring about that suppuration by which it wishes to expel the disease.

A cold application therefore must be highly improper here, for nothing tends to diminish or weaken the action of a part more than cold. Bleeding would in all probability be death to the patient; and indeed the pulse, which ought always to be consulted before we perform venæsection, will be found not to indicate the necessity of it. It will be quick but low, the pulse of irritation, not of inflammation. In a word, the treatment here must be totally opposite to that which is used for every other kind of phlegmon. The warmth and action of the part, as well as of the habit, must be increased, and the much-wished-for end of suppuration must be forwarded by all possible means. The bark therefore and cordials internally; and the external use of warm, stimulating, aromatic applications are clearly indicated. The topics may be either the cataplasma e cymino, the theriaca*, or plasters made of galbanum, sagapenum, frankincense, or any of the warm gums.

But though we have observed that the process of suppuration when begun can scarce ever be interrupted by art, except in critical inflammations where there is a want of vis vitæ to form matter; yet there is also an exception to this rule, with respect to inflammations and suppurations arising from what are called specific diseases: for the medicine which acts as

* Of the old Dispensatory.

a specific against the disease, if applied to the part, will effectually diminish the degree of suppuration, even after the matter is formed.

Thus, in venereal buboes, however far advanced, the constant application of mercury to the part, contributes greatly to lessen the quantity of matter formed, and to diminish the size of the tumour*. This would also undoubtedly be the case if we could find specific remedies for the inflammations excited by any other kind of virus. Thus the application of alkaline spirit acts specifically against the sting of a wasp.

The last circumstance stated as necessary to be attended to in endeavouring to cure inflammations by resolution, is the use of evacuating or purgative medicines. These however should be administered with caution, since strong purgatives seem in general to be very improper in inflammations; they irritate the habit, by which they may also tend to increase irritation in the part. The only intention therefore with which evacuating

* Venereal buboes are certainly to be diminished *in bulk* by the use of mercury, but whether this arises from "the quantity of matter" contained in them being "lessened," or from *a diminution of the containing parts*, will admit of a question. When a Gland is inflamed, there is not only a great enlargement and induration of itself, but also of the surrounding glands; the tumour being often made up of several smaller tumours. I suspect that mercury reduces the bulk of the whole mass, chiefly, if not solely, by resolving the hardened parts, the suppuration seeming to become *more compleat* in proportion as this takes place. If we agree with the author however, and suppose that *the matter* within the bubo is *capable of being lessened* by the employment of mercury, this circumstance can only happen from the power of increasing the action of the absorbents which is commonly attributed to that remedy; and this, in a practical view, will hardly be found to deserve our approbation, for reasons almost too obvious to enumerate.—We have no cause to believe that venereal matter, when once formed, can be acted upon or altered, in its infectious qualities, by the operation of mercury: if this be true, its absorption into the system is not only to be dreaded, but opposed by every method in our power, and I am strongly inclined to believe, nay, I can almost say, it has been proved to me in some instances, that the recurrence of venereal complaints, so vexatious both to surgeons and their patients, has been occasioned by an existing, but unsuspected, source from whence the constitution has been contaminated afresh, so as to render repeated and severe courses of mercury insufficient for the cure. Sinuses formed in the neighbourhood of venereal abscesses, are exceedingly likely to retain virulent particles, capable of continuing, or rather renewing, the disease; and one of the cases just alluded to, was of that kind. H.

medicines

medicines should be recommended, is merely to counteract the effects of costiveness, which is apt to be brought on by the general increased heat of the habit in most inflammations, and which, itself, contributes to keep up that heat. The body should therefore be kept cool and open, as nearly as possible in the natural healthy state of one evacuation every day.

We have now gone through the doctrine of inflammations, and laid down rules for their general treatment, distinguishing the phlegmon from the erysipelas, and pointing out the remedies to be employed for the cure of each. These principles however must be varied according to the nature of the disease, and the appearance it takes on, at the discretion of the surgeon. With respect to the inflammations of particular parts, the treatment of them will be considered hereafter; at present we shall only add a few reflections on the erysipelas, and on particular kinds of it.

The erysipelatous inflammation seems, as far as my observation has carried me, to be in general exasperated by the use of emollient applications. As the great principle of the disease appears to be an extraordinary increase of irritability in the part, sedative applications to lessen that tendency seem to be indicated. It is for this reason perhaps that we often find the Goulard water so peculiarly efficacious; yet, it must be allowed that its effects are not always thus beneficial, since many of these inflammations, far from yielding to saturnine topics, have been evidently exasperated by them. Lime water, a solution of sal ammoniacum or of nitre, have also been tried, and with as little success. At length, after having had recourse to a great variety of applications, spirit of wine strongly impregnated with camphor has at last proved effectual. This remedy I have repeatedly known to be the only one, by which patients have experienced any kind of relief, in the excruciating torture which is sometimes experienced, from a very high degree of irritation in an erysipelas. It seems therefore to be a kind of specific against this kind of inflammation, and if so, I apprehend it is only to be attributed to the highly sedative powers of the camphor; for I have observed that the greater the proportion of that remedy contained in the application, the greater has been its effect. Camphor,

phor, we likewise know, is a medicine of considerable efficacy against those inflammations of the fingers or toes which are called chilblains; and, if timely and carefully applied, will infallibly prevent this kind of erysipelas from terminating in ulceration*.

It has been already observed that one of the terminations peculiar to inflammation, is *suppuration*, or the formation of pus. The signs of approaching suppuration are, a continuance and increase of all the symptoms attendant on inflammation, notwithstanding all our endeavours to disperse it; a greater elevation and more palpable circumscription of the tumour; and lastly, rigors or shiverings, which are a certain indication of the forming of matter.

We will now suppose that matter or pus has collected, and that it is also evident to the touch from the fluctuation of it under our fingers. The tumour thus formed is called by surgeons an abscess, and the fluid contained in it, matter or pus. But by what process is this fluid collected, in consequence of previous inflammation existing in a part, in such a quantity as to form an abscess; and what is the nature of the fluid itself? These are objects that require to be very particularly considered, and many opinions have been formed concerning them.

Some have imagined that pus is produced partly by an alteration made in the fluids of the part, and partly by the breaking down of the over-distended capillary vessels, the dissolution of the fat, and of other substances about the tumour; all which, are said to be blended with the altered fluids of the part. Others have supposed that suppuration is a kind of fermentative process carried on in the fluids of the part affected; while others again consider it (with DE HAEN) to be a secretion *sui generis*. With-

* The author has said nothing on the treatment necessary in *mixed cases* of phlegmon and erysipelas. But surgeons, knowing the remedies suitable for each species, will of course be guided, in this respect, by circumstances. Where phlegmon is found to exist, it seems most requisite to direct our attention to that in the first instance; at least, we are warranted, in such cases, in having recourse to a bolder treatment than might be proper where the erysipelatous disposition appears to predominate. H.

out dwelling upon this question, which is more curious than useful, I shall just observe that at present I am most inclined to agree with the last opinion, that pus is a secretion*.

But

* The reader will probably not be displeased to have, inserted here, an extract from a late ingenious Dissertation ON THE PROPERTIES OF PUS, by Mr. HOME.

After a series of well-directed and satisfactory experiments made with a view to ascertain the truth of Mr. HUNTER's opinion on this subject, namely, that *PUS is a secretion, or at least a fluid formed from a similar structure of vessels as the secretions from the blood*, Mr. Home recapitulates the circumstances, which, in his opinion, tend to establish this theory. He observes, that,

1. "In its chemical analysis, PUS is found to contain similar substances with the blood."
2. "It is, in a recent state, free from any tendency to putrefaction."
3. "It is always in harmony with the parts which form it, having no power of irritating them, even when the surrounding parts are affected by it. This seems to be peculiar to secretions; and may be illustrated by the tears excoriating the cheek, although no such effect is produced on the lachrymal gland or ducts."
4. "Its appearances vary according to the state of the constitution at the time; and are affected by very slight changes in the general habit, similar to secretions; which could not be made up of the solids and fluids of the part."
5. "It is readily absorbed or taken back into the circulation, without producing any ill effect upon the constitution."
6. "The parts which form it assume a structure similar to that of a gland, by becoming exceedingly vascular: and what is curious, and deserving of observation, is, that parts appear to require more time to be rendered fit for carrying on this process in proportion as they are different in structure from a gland. In internal canals, which have naturally a secreting surface, pus is formed in five hours. On the cutis, which is very vascular, in less than twenty hours: and in common muscles, nearly in forty-eight hours."
7. "It is composed of globules swimming in a transparent fluid; which is the case with many secretions."
8. "It is thinner at the time of leaving the vessels than afterwards, similar to secretions in general."
9. "It

But whatever may be the mode of this fluid being formed, the nature of it when once formed, is a circumstance to be determined by our senses. Pus, or what is called laudable or good pus, is a cream-coloured, bland, homogeneous fluid, somewhat salt to the taste, and devoid of smell.

From this description of good pus, such as we find generally collected in well-formed abscesses, it is manifest that it must be a most harmless and inoffensive fluid; and indeed, practice has afforded me a few instances, in which I have seen large collections of this fluid, or, in other words, large abscesses, which the surgeon intended to open the next day, but which have disappeared entirely in the course of the night, leaving no traces behind. Neither has this sudden absorption of matter been attended with any inconvenience; for though care was taken to give the patient a few purges afterwards, it appeared that this was by no means necessary, not the least symptom of danger or disease having succeeded.

This however relates only to pus in a sound state; but it may become altered or acrimonious in its nature, when it certainly cannot be so very inoffensive a fluid. One of these alterations manifests itself by the smell; for if, in letting out the matter of an abscess, it should have a putrid smell, which is often the case, that matter is certainly of an acrimonious quality. It is frequently found also mixed with blood and other fluids, when it loses its cream colour and becomes of a dark, dirty, brown hue; in which case, it is called purulent sanies. In other instances it loses its consistence, is much thinner than it ought to be, its colour inclining to yellow, somewhat resembling serum, and in this state it is termed ichor.

9. "It is highly probable, from what we know of the secretions in general, that they must, in every instance, leave the terminations of the secreting vessels in a very fluid state; and must take on the consistence they are found to possess, either immediately, or soon after they are secreted, similar to pus."

To those who are desirous of carrying still farther the investigation of a subject so highly important to Surgery, the attentive perusal of this very intelligent publication cannot be too strongly recommended. H.

Abscesses

Abscesses may be divided, with respect to their situation, into internal and external. We call them internal, when they affect the cavity of the head, of the chest, of the belly, or of any of the joints; external, when they have their situation in any of the outer parts of the body. The external again, may be divided into deep seated, or such as are under the fascia of the muscles; and superficial, or such as are situated in the cellular and adipose membrane, or among the common integuments under the skin; which division will be found to require a considerable difference in their treatment.

Abscesses, with respect to their nature, may be distinguished; first, into abscesses of the glands, which may take place in any of the lymphatic glands throughout the body, but which most frequently affect the parotid and submaxillary glands, and are the usual characteristics of the scrophula; and secondly, into critical abscesses, or such as happen after any acute disease, and supply the place of that critical resolution by which the disease, in its natural progression, should have been removed.

These several divisions of abscesses, from their situation and from their nature, we shall find useful in laying down general rules for the treatment of them, which we shall first proceed to do, and then mention the particular treatment proper for every abscess that may happen in any part of the body.

When we are convinced that pus is collected in any part, and forms what is called an abscess, that fluid must be considered as an extraneous body, and therefore the first general consideration is to procure a speedy vent for it. It is however a general rule, not to make an opening till we are perfectly sure that matter is formed, and in many cases not till we are certain of the abscess being come to maturity, as it is called; that is to say, not till it appears that the increase of the disease is stopped, and all the pus which we may suppose would be formed in the tumour is already collected there.

Now by what criterion shall we determine this? It has been already said that when pus is forming in an abscess, the progress of the inflammation is increased, the tumour becomes more elevated and circumscribed, rigors and shiverings take place, and lastly, the fluctuation of the matter is evidently felt under the fingers. This holds good with respect to those abscesses particularly that are seated in the superficial parts of the body, in the cellular and adipose membrane. But in deeper seated abscesses, such for instance as are formed under the thick fascia of the muscles in the thigh and in the back, these signs are not evident, and indeed many of these tumours are not attended with any kind of change of colour in the skin. Habit therefore must go a great way in assisting us to form a determination here. By frequently seeing and touching deep-seated abscesses, we not only become sensible of the fluctuation, though deep, but the eye will be almost sufficient of itself to fix the judgement. We must not however fail to attend particularly to the mode of their formation and progress. Whenever a tumour, though having no redness of the skin, shall have been formed with great pain, and when it has come on after some external violence, or after some acute distemper, and that moreover the patient shall have complained of irregular rigors or shiverings; from all these circumstances taken together, we may have good reason to conclude that matter is at least forming.

But there seems to be one farther point necessary to be considered, and that is, by what criterion we shall judge whether the matter in these deep-seated abscesses be completely formed, or in other words, whether it be the proper time, according to the general rule, for giving vent to it. And here if we constantly bear in our minds one of the axioms of that great and accurate observer of nature, Hippocrates, we shall have a general rule to lead us in most instances. This axiom is, *Περὶ τὰς γενεσίας τῆ πυρῆς, εἰ πόνοι καὶ οἱ πυρετοὶ συμβαίνεισι μάλλον ἢ γενομένης*, that is to say, *there is a greater pain and fever while pus is forming, than when it is formed.*

If therefore, after the fore-mentioned symptoms attending a tumour, and particularly after the shiverings, we should perceive a remission of
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the violence of the symptoms, without any sensible diminution of the volume of the tumour, or rather, perhaps, with an increase of it, we may then conclude that the matter is compleatly formed. This rule however, though very extensive, is not, as we shall find, applicable to every possible case; since, when we come to consider the treatment of each particular abscess, we shall find one or two instances, in which we have scarce any other criterion to judge of the existence of matter, except the violence of the pain, and hardly any other motive to determine us as to the necessity of making a speedy opening in the part.

Having thoroughly made ourselves masters of all the signs or indications of existing suppuration, the next business is to consider of the mode of giving vent to it. This may be done in three ways; by nature, by incision, and by caustic; all of which it may be proper occasionally to adopt, according to the different situation or nature of the abscess.

In all superficial abscesses seated in the cellular or adipose membrane above the fascia of the muscles, particularly if they be not of any considerable extent, in general there can be no harm in leaving them to nature, so as to let them burst of themselves. The best application to an inflamed abscess advancing to suppuration is something, of an emollient kind, that shall keep the part as supple and as easy as possible. Poultices made with the saturnine water and crumb of bread, or with the linseed cake and water, I think preferable to the ordinary applications, as I have before had occasion to observe.

In these superficial abscesses the same application may be continued after the tumour has burst, and if there be any induration existing in the surrounding parts which does not give way in a few days to emollient cataplasms, the addition of a small portion of mercurial ointment spread on the surface of the poultice will greatly assist in softening it. This plan should be continued till all the matter is evacuated, and all the inflammation and hardness are dispersed; when it may be proper to lay aside the emollients, to cover any little sore that may remain with a pledget of cerate, and to

make use of gentle pressure by bandage to hasten the consolidation of the parts.

If the seat of the abscess be in the glands near the skin, (which is also a superficial abscess) it may be necessary to make use of more stimulating cataplasms; for, in these cases, the suppuration is generally very tardy, and requires to be quickened. Some have recommended poultices of onions, figs, and lily roots, for this purpose; and the author of a late publication on this subject, strongly advises an epithem made of honey, flour, and yolk of egg, which he says shortens considerably the duration of the disease. But if the superficial abscess be of any extent, we shall find, that the opening made by nature will not be sufficiently large to evacuate the pus. We shall therefore be under a necessity of making an artificial opening, and the best mode of doing this is by a free even incision with a clean-cutting knife. The opening should be made without any regard to the direction of the muscular fibres, and in the longest, not the longitudinal, axis of the tumour, unless that should prove the longest, which is seldom the case, for in these swellings the transverse axis is usually the longest.

This kind of abscess, when it requires an opening on account of its size, may likewise be punctured as early as the matter is formed; and although there should be some little hardness, it need not hinder the operation, for that will easily be resolved in the course of the cure. In general I have observed, where it is necessary from the size of a superficial abscess to open it, that the sooner the opening is made the better. This practice saves the patient much pain, by putting a stop to the progress of the disease, and by preventing the skin from being thinned to a considerable extent, so as to occasion the subsequent loss and destruction of it. But when the abscess happens in the superficial glands, it is much better, if possible, never to open it by artificial means; because, as the cure of the distemper depends upon the melting down of the whole substance of the gland, the longer the pus is permitted to sojourn in the part, the more compleatly will this effect be obtained.

As in the superficial abscess which is not glandular, early opening is to be recommended, in order to stop the progress of the disease; so, in the glandular abscess, we interdict it with a view to encourage the progress of the disease on which the cure principally depends. Again, if the glandular abscess be so large as to require opening, it will be evident that the best mode of doing it will be by caustic, which will be found infinitely preferable to incision, because the object is not to save, but to destroy the affected part. Thus in venereal buboes, when it is necessary to open them, the caustic will be found to be by far the most eligible mode.* But if the abscess be in the sub-maxillary glands, where it is necessary as much as possible to avoid deformity, and consequently the loss of skin; if the swelling be so large as to require an artificial opening, it will perhaps be better to avoid the caustic and to make a small opening with a lancet at each extremity of the tumour, by means of which, we may introduce a seton and, very possibly, destroy the gland without affecting the skin that covers it. Nor is even this rule of waiting as long as possible before we make an opening in abscesses of the glands, to be admitted without an exception; for, when we come to consider the abscess in the lactiferous glands of the breast, we shall find that a contrary practice will be attended with the most salutary consequences.

In the deep seated abscess, or that which is under the fascia of the muscles, where there is in general no inflammation of the skin, if the tumour does not advance kindly to suppuration, instead of the suppurative cataplasm recommended in the other abscess, we may use with propriety and with good effect, any of the warm stimulating plasters made of

* I confess I scarcely ever saw a *venereal* bubo that required this *extensive application* of the caustic. The disease, in general, very rapidly removes the superficialities, and reduces the abscess to the state of an ulcer, (if the previous use of mercury has not been so considerable as to oppose this process;) in which case, there is no advantage to be expected from an opening that is more than sufficiently extensive to favour the free digestion of the wound. But the proportion of true venereal buboes, to the number of glandular abscesses which are generally deemed such, is very small; even though these may have owed their origin to symptoms palpably venereal in themselves. H.

gum ammoniacum, or galbanum. But in these deep seated abscesses we must pursue a very different mode of treatment from that which we have just recommended for the superficial abscess. In the latter, although, when an opening is required, it may be useful to have recourse to it early, yet no great danger can attend a little delay, especially since it has been observed, that some of them might be left to burst of themselves: but, in the deep seated abscess, however small the extent of it, not only the case can never be cured without an artificial opening, but it is likewise of the utmost consequence that this opening should be made as early as possible, and as soon as the Surgeon's knowledge and penetration lead him to judge, by attending to the circumstances already mentioned, that the pus is formed.

Let us consider a little, the nature of the parts surrounding the matter. In the fore part of the tumour there is a strong inelastic tendinous expansion, forming a considerable resistance to the distending power of the fluids within; so that, until this resisting fascia be stretched to such a degree as to break, the matter cannot possibly come forward to the skin. But the back part and sides of the abscess are of a very different nature: they consist either of soft muscular fibres connected with yielding cellular membrane, (proper substances either to be destroyed by the pressure of the incumbent fluid, or to transmit that fluid through all the interstices of the muscles, so as to form burrows, holes or sinusses for the matter which extends the mischief to the neighbouring parts, or perhaps diffuses it through the whole of the limb) or else these parts may be thin membranes, as in the instance of the abscess under the fascia of the abdominal muscles, where, sooner than the strong tendinous expansion will burst, the matter will be more likely to pierce the peritoneum and evacuate itself into the cavity of the abdomen, where it must generally prove fatal. Or lastly, the matter may be seated near the surface of some bone, where if it be suffered to remain, a caries may be the consequence. From all these circumstances the necessity of making an early opening will appear; and it will likewise be evident, that the opening should be made, not by caustic but by incision. It is proper indeed that these deep seated abscesses should
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be opened very largely, and that the fascia covering them should be freely divided, in order that the Surgeon may get fairly at the bottom of the abscess, so that if there be any sinusses running among or between the interstices of the muscles, he may either be able to lay them open, or by tracing the direction in which they run, make counter-openings wherever they may be required.

In the inside of most abscesses we likewise meet with portions of the cellular or adipose substance, or perhaps of separated coagulable lymph, which do not make part of the parietes of the cavity, but run through the middle of it, forming so many little bars of flesh, passing across from one side of the abscess to the other. These must be searched for with the finger, and wherever we find them, they must be cut through with the knife. Sometimes we shall meet with them of considerable thickness, and much indurated.

Nor should it be conceived, though this rule of early opening in the deep seated abscess is founded on theory, that it is wholly unsupported by practice. On the contrary, by opening these abscesses early, they have sometimes been cured, though extremely large, and containing very large quantities of matter, in a month or six weeks; while other tumours of this nature, which, from their slow progress in the early stages, have been either neglected by the patient, or suffered to come forward, or ripen, as it is commonly called, have kept the patient six months under treatment; during which time, he shall have been in imminent risque of his life. This tedious prolongation of the complaint has been entirely owing to the matter being suffered to remain longer in the part than was necessary, by which sinusses have been formed, the number and direction of which, it was, at first, perhaps impossible to discover, and which, having manifested themselves with painful and aggravated symptoms in the course of the cure, have at length required a separate and particular treatment. In general, when once matter is formed in a tumour, it may be considered as ripe enough, and therefore fit to be opened.

But this rule of opening deep seated abscesses as early as possible, is not without its exception. The only circumstance however, which may be said to form a general exception, arising from the nature of the disease, is in the case of critical abscesses, or tumours formed to carry off the remains of something morbid from the system. Here nature, exhausted by the violence or continuance of the disease, and exerting her last efforts to expel the enemy from the constitution, is sometimes deficient in powers to produce that degree of inflammation sufficient to prepare or to secrete the fluids in a proper manner, so as to form well-concocted, good pus. If we open these critical abscesses too early, we shall disturb nature in her operations, and she may never after be able to execute them compleatly. We shall give vent to crude, unconcocted, unprepared fluids as it were, and only carry away a part of what the constitution wishes wholly to get rid of.

It is most advisable therefore, in these cases, to wait till the inflammation appears to be raised pretty high, and till the disease of the habit seems to be all transferred to the part; and this an accurate observer may distinguish in the appearance of the patient's countenance, which, from being very morbid and sickly, puts on a more healthy and promising aspect.

In these critical abscesses, we may therefore, in general, wait to observe the turn and progress of the disease; unless there should be some circumstance, of material consequence, which indicates a contrary intention: as when we have reason to apprehend that the matter may make its way either into the cavity of the thorax or abdomen, or when it may injure some part of consequence; or lastly, in critical abscesses after the small pox, which I have learnt from experience, are, in general, fatal, unless they be opened early. There may be some cases likewise, where the critical suppuration is going on very slowly, to the utmost hazard of the patient's life, and when the part seems to require an additional stimulus. To such a kind of slow critical tumour, a prudent Surgeon may even venture the application of a caustic, by which means, he may be likely to assist the powers of nature in hastening the formation of the matter, and

and expelling the disease. But if he proposes to open such kind of tumours with this intention and in this state, it is plain, he ought not to prefer the mode by incision to that by caustic; for the latter, while it is acting, may, by its stimulus, produce the desired effect.*

It is also another general rule in the treatment of abscesses, to lay open all the sinusses and cavities we may find belonging to them. However judicious and salutary this practice may be, there are some cases in which it is needless, and others where it is impossible. For instance, it is scarcely ever necessary to open superficial or cutaneous sinusses, from which the matter may be readily expressed, and which may afterwards be cured by proper compression; unless it should so happen that the bottom of the sinus is situated in a depending part, and the opening of it above, when it may be impossible to force out the matter by compress and bandage, and when we may be obliged either to lay open the sinus through its whole extent, or to open the bottom of it and pass a seton through the rest.

Nor need we in general to lay open sinusses, whose opening is in a depending part, for in these, the matter, finding a ready issue of itself, the sinus will soon be closed. Neither is there usually any necessity for opening sinusses which are situated in such a manner that a counter-opening may be made with facility, and the lodgement of the matter prevented.

Whenever sinusses are so deeply situated, that they cannot be opened without the risque of injuring some part of consequence to the machine, large incisions are to be avoided. But, in this case, we must examine the parts with great attention, in order to judge whether any benefit can arise from a counter-opening or not. Indeed the proper management of counter-openings, is a circumstance which evinces the skill of the Surgeon

* One effect attending the application of a caustic, is plainly that of rendering *suppuration more compleat*; an additional reason why, in opening abscesses, this mode should be preferred to incision. H.

on as much as any one point of the art. In compound fractures particularly, I cannot help observing, that many limbs may be saved by counter-openings, judiciously made, and with attention; for the direction of sinusses, in these cases as well as in abscesses, must be carefully traced and noticed, otherwise the counter-openings, as I have often seen, will be made in vain.

When a superficial abscess is opened, the pus is to be pressed out of it very gently; for it is bad practice, to squeeze all the parts of an abscess with violence, in order to press out every drop of matter contained in it. The Surgeon, in doing this, counteracts the views of nature; for strong pressure, upon parts which are still in a suffering state, increases the inflammation, and renders the suppurating process longer. The complete evacuation of pus from an abscess, rather retards than accelerates the cure; since, in most abscesses that have been opened, there are still some of the surrounding parts in an inflammatory state and tending to suppuration, to which nothing can encourage them more, nor of course tend to relieve them sooner, than the contact of that mild, bland fluid, called laudable pus.

In the superficial abscess too, when the matter is evacuated, the dressings applied ought always to be superficial. In compliance with custom I used formerly to insinuate a small bit of dry lint, or a pledgit spread with some digestive ointment between the lips of the division, to keep them gently asunder; but experience has taught me that this is not necessary, since superficial abscesses of no inconsiderable extent, may sometimes be cured by a simple puncture without laying open the whole cavity of the abscess. At any rate, I would avoid putting dry lint to the divided lips, because however great the discharge, it is very apt to stick to them, and prove uneasy. One would therefore either dip the lint in oil, or spread it with some soft ointment. How improper then must it appear, to fill an abscess quite full of dry lint, as has, I fear, been much too generally practised.

In deep seated abscesses, it is not quite the same thing. In these, we have laid it down as a necessary rule, to get at the bottom of the abscess; and it may be also proper to keep the wound open for a longer time, in order to facilitate the free evacuation of the pus from any sinusses that may be found. Some sort of dressing must therefore be introduced into the cavity of the abscess in order to keep it open as much as possible, and dry lint is as good as any other; for, as the opening is in general large, and the discharge very great, the dry lint may be introduced beyond the lips of the wound, where it will not stick, on account of its being continually moistened with matter. Care should be taken however, to insinuate the lint very lightly, not to stuff it in with force to fill up the cavity of the abscess; nor should we even suffer it to extend to the edges, which ought always to be defended by some soft ointment. An attention to all these minutiae, will spare our patients much pain.

Having thus considered the treatment of abscesses in general, we proceed to give an account of those that may be formed in different parts of the body, and of the treatment peculiar to each. In this detail we shall see more particularly, the various exceptions to the general rules we have formerly laid down. We begin with the Panaris, or *whitloe*, which usually attacks the extremities of the fingers, and is the most frequent of all abscesses.

PANARIS OR WHITLOE.

The panaris or whitloe, called by the Greeks *Paronychia*, is a phlegmonous abscess appearing about the nail, (as the Greek term expresses it,) or at the extremities of the fingers. This disease is classed into four kinds from the different seats of it, and it is particularly necessary to distinguish each species from the other, on account of their different degrees of importance, and the necessity of treating them differently.

The first species is situated round the nail, immediately under the cuticle or epidermis. It is in general a disease of little consequence, but may be made troublesome by ill treatment.

It begins by forming a little swelling, attended with a degree of redness, and some pain at one corner of the nail. A linen compress dipped in spirit of wine and camphor, applied moderately tight round the finger, and kept constantly moist, very frequently proves sufficient to cure the complaint in a few hours, and prevent the formation of matter. I knew a lady who was very subject to frequent attacks of this disease. She had been taught always to treat it with the good old woman's remedy, a bread and milk poultice, and by this means the complaint frequently lasted a fortnight, and proved extremely worrying and troublesome. I directed her, as soon as she felt the least pain in the finger, to dip the part and wrap it up in spirit of wine and camphor. By this management she never afterwards had a whitloe that proceeded to suppuration.

But if, notwithstanding these precautions, matter should still make its appearance, which it generally does at first, by one white spot under the cuticle, we must not delay cutting off the cuticle from that spot immediately, and from every part of the finger where it is raised. The application of a piece of rag, wet in the Goulard water, and renewed when dry, is then sufficient to cure the disease in four and twenty hours. But if, on that evening, we delay opening the cuticle, which is easily separated from the subjacent skin, it becomes loosened by the matter, which extends perhaps round the finger, and sometimes a considerable way down it, and what is worse, destroys the adhesion of the nail to the cuticle from which it is produced. Hence there is a necessity for casting off the old nail, and consequently waiting for the growth of a new one, which makes a tedious and troublesome disease of one that would have been well in a few hours if properly treated at the outset. We see therefore, even in the most trifling cases, how much mischief may be prevented by a little timely attention and observation*.

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* Sometimes the first appearance of matter is *under* the nail. In this case the disease will grow considerable, and the nail will infallibly be separated unless a piece of it be cut out with a penknife so as to give a free vent to the matter. Of the first species of whitloe, this is the most unfavourable, on account of its situation, and requires more attention in the after-

The second species of whitloe is seated immediately in or under the cutis, in the adipose membrane about the end of the finger.

The inflammation, being greater here, and also the pain, from the greater sensibility of the parts concerned, the disease becomes of a little more consequence. There is a strong throbbing and pulsation in the part, and a considerable elevation of the skin. We may attempt to disperse this abscess by immersing the finger for half an hour at a time in warm water, and by keeping rags, wet with the saturnine water, constantly applied to the part; but if these attempts should fail, the sooner the matter finds an issue outwardly, the better; every thing therefore, that tends to remove the obstacle to the exit of the matter, should be speedily attempted. The cuticle in these parts is very thick, and it often happens that the matter shall have got through the skin, and shall not be able to make its way through the epidermis. For the natural thickness of the cuticle is here increased by the inflammation, and by the practice of soaking the part constantly in a bread and milk poultice. This is evident to the senses, for the cuticle becomes white and perfectly opaque, resembling that of washerwomen who have been soaking their hands all day in water*.

In slight cases of this sort, I have known the separating of the lamellæ of the cuticle from each other, or, in other words, the thinning of the cuticle, prove sufficient to afford an outlet, either at the time or in a few hours after, to the matter, and to cure the disease. In several instances,

after-treatment, than might be expected. The use of a poultice, prepared with lead water, should be persevered in till the disease is *wholly* at an end, and the opening in the nail afterwards protected with adhesive plaster. H.

* The author seems here to be a little inconsistent, and to have forgotten the advice he has just given to attempt the cure of this kind of whitloe, while in an incipient state, by soaking the part "for half an hour at a time, in *warm water*." Nor, does his *objection* to a poultice, upon his own principle of *relaxation*, seem less contradictory. It is an obvious fact that the cuticle of a washerwoman's hand becomes *greatly relaxed* by long immersion in water; how else should it become wrinkled, as we commonly see it? H.

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where there existed an evident tumour, with no fluctuation, but, from all appearances, a tendency to suppuration, I have succeeded, in preventing farther mischief, by plunging a knife into the prominent part through the skin and fat; which effect, I imagine, can only have been produced by unloading the vessels of the part, in the same manner as topical bleeding cures inflammation.

The third species of whitloe is seated underneath the sheath of the flexor tendons of the fingers.

This is a disorder infinitely more violent and dangerous than either of the two former. The matter being deeper seated, under strong ligamentous parts, such as those thick bands placed at intervals over the flexor tendons to confine them in their position, meets with still more difficulty in finding its way outwards. It therefore insinuates itself under and along the sheath of the tendons, and gets into the hand, where the fluctuation is generally first felt in the palm, under the aponeurotic expansion of the palmaris muscle. From thence, the matter sometimes proceeds along the palm of the hand, and having reached the annular ligament of the carpus, passes under that into the fore-arm.

The pain of this disease is most excruciating, not only from the inflammation of these strong parts, but also from the very great resistance they make to the distending power of the matter. A great degree of fever is consequently excited, the patient can have no rest, and a greater or less degree of delirium ensues, according to the greater or less violence of the complaint.

To prevent all the fore-mentioned evils it would perhaps be only necessary to make an early incision, into the part first affected, through the strong ligamentous bands confining the tendons; but one thing is to be observed, that if we make a simple incision, the great swelling and distention of the parts prevents that incision from having any effect, and the

the wound appears closed almost as soon as it is made. I therefore make it a rule, in such cases, to cut off a portion of the integuments and thus make a large and evacuated wound, which admits of a free discharge of all the matter, and procures immediate relief to the patient. If the tendon itself be diseased, or the ligamentous bands which confine it, it will be necessary, not only to make an incision through them, but to remove part of the ligament, and even part or the whole of the tendon; for that, if it be diseased, will infallibly slough away. In a word, at all events, a free opening is to be made; otherwise we might as well make none.

If this opening be made very early, all the dreadful mischiefs we have been describing, and which sometimes lead on to amputation, sometimes even to the destruction of the suffering patient, might be prevented. However, in whatever stage of the disease the opening may be made, it is right to follow it up as far as the matter reaches. If it should extend through the palm of the hand, the aponeurosis of the palmaris must not only be simply cut through, but freely divided or set loose in various directions, that there may be no tightness or tension remaining. It is even necessary to follow up the matter through the carpal ligament and into the arm, if it should have reached so far. But all these evils may in general be prevented, as we have before observed, by an early opening; and it is rather a matter of surprise, that this salutary and effectual mode of treatment should ever have been neglected, because there is one symptom which is peculiarly characteristic of this disease, and distinguishes it from every other species of paronychia. This is, a violent pain which the patient complains of in the internal condyl of the humerus, and which happens in consequence of the two muscles, called profundus and sublimis, terminating in the flexor tendons of the fingers, which are the parts immediately affected in this complaint.

The best dressing for this kind of whitloe when opened, is oil of turpentine, or some such stimulating and spirituous dressing. Greasy and unctuous compositions generally increase the evil, and should only be used as retentives to other dressings.

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The fourth species of whitloe, is when the matter is formed under the periosteum, between that and the bone, or in the body of the bone itself.

In this, the pain is much more deep seated, and is not felt at the internal condyl of the humerus, as in the former species. The pain is very violent, but, in the beginning, not quite so much so as in the third kind. The swelling and tension of the finger are much less; and are, in general, confined to the part itself; but the pain soon increases so as to bring on fever and delirium as in the fore-mentioned case. The finger frequently becomes livid and is covered with little blisters containing a bloody serum, and threatening a mortification.

This is a case which demands the Surgeon's utmost sagacity and resolution; yet we may venture to say, if these be properly exerted, that the result will generally be the preservation of the finger, which otherwise would infallibly be lost.

When a violent pain therefore rages at the extremity of the finger, causing fever and delirium, though there may be no other symptoms to lead us, we are warranted in plunging a bistoury (in by the *side* of the finger to avoid the tendons) through the periosteum, and down to the bone. I have frequently done this to very great advantage, and have given vent to a single drop of brown-coloured matter or purulent sanies, and this has commonly been sufficient to cure the patient; all the violent symptoms having presently disappeared.

We are apt to feel doubtful as to the propriety of attempting this operation, from the uncertainty of meeting with and giving issue to matter. But I have found from experience, that, whether matter be formed or not, (in which however we can seldom be mistaken) the relief will be the same; so that nothing ought to deter us from the undertaking.

If it should be found, that the incision recommended does not produce the desired effect within four and twenty hours, and that the disorder should continue raging with as much violence as ever, the amputation of the finger must take place, and as we are certain that we must come to that at last, the sooner we do it the better; for we shall shorten the duration of the disease much by it, since all the violent symptoms will cease almost immediately upon the amputation of the finger, and therefore the patient will be relieved much sooner, than if we had waited the event of the disease.

We have an instance upon record of this being done without the assistance of a Surgeon. A miller, seized with a whitloe of the third species, had suffered so cruelly for a fortnight, that he was grown quite furious with the pain. The inflammation of his finger had extended to the bend of the arm, and even to the arm pit, where some very painful tumours began to be formed. In this situation he was resolved, without consulting any one, to cut off his finger with a hatchet. He placed the instrument a little below the articulation of the first with the second phalanx, and ordered his wife to strike upon it, which she, from fear of her husband's desperate situation, as well as from the hope of putting an end to his torment, executed. From that instant, all the symptoms were assuaged, the tumours began to disperse, and in a very few days all the pain was gone, and the patient experienced no kind of inconvenience during the rest of the cure. A methodical incision however, made by a Surgeon, might perhaps have afforded as much relief, and the finger might also have been saved.

The necessity and utility of early opening in the two last species of whitloe, is confirmed by another circumstance, which experience has given me an opportunity of asserting with some degree of confidence. When, after having made a deep incision into these parts, with an intent to let out matter, it has so happened that no matter has followed the incision; I have notwithstanding seen it flow plentifully, on the following day, from the orifice I had made.

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Let us now pass on to abscesses that happen in or about the joints, and as the one which affects the knee is by far the most common, let us take the treatment of that as a model for proceeding in all other cases of the same kind. The matter in these cases is either collected externally, in the parts surrounding the joint, or it is seated within the cavity. The first case is always curable by proper treatment, the second is infinitely more dangerous.

Collections of matter externally, in the tendinous and ligamentous parts, are often the consequence of contusions, of punctures, or small wounds made into them by instruments which rather bruise than cut; such as glass, a nail, or a stone, while, in collections of matter in the cavity of a joint, the cartilages themselves which concur in its formation, the capsular ligament, and the fat within, have all been affected by the injury done, and are brought into a state of disease.

Here again, the necessity of making early openings is evident. If the matter be formed externally, the early opening will be necessary to prevent, if possible, the pus from corroding the ligaments of the joint, and insinuating itself into the cavity, which it will infallibly do, if left there too long. In these deep seated abscesses, if the Surgeon timidly waits till the fluctuation becomes evident, which may not happen of a long time, he will expose his patient to infinite danger, which a bolder practice would almost entirely avoid. As soon therefore as there are any rational grounds for supposing the existence of pus in the part, we should let it out. These may be determined by the preceding inflammation, by the continuance of pain, and particularly by the œdematous feel of the integuments surrounding the joint, which is a characteristic sign almost always attending and distinguishing these deep-seated abscesses.

But it is not alone sufficient in these cases to make an early opening, it is also necessary that the opening should be extremely large and free, that all the aponeurotic parts, which particularly oppose a firm resistance to the issue of the matter, should be freely divided and set at liberty. The matter,

matter, too, always surrounds the forepart of the joint, so that after having opened on one side of the patella freely, and in the most depending part, I always lay it down as a rule to make a counter-opening of the same kind on the opposite side of the patella. It is never necessary to open the upper part of the abscess running over the patella; for as there are two depending openings, one on each side of the patella, a linen compress placed upon that bone, and pressed moderately with a roller, will effectually prevent any lodgement, and answer every purpose. By this simple management, I have cured great numbers of these cases, which at the time of their coming into the hospital appeared very formidable. But above all things it should be observed, by those who wish to meet with uninterrupted success in the treatment of these abscesses, not to be sparing of incisions.

I shall take this opportunity of relating a singular case of a complaint on the patella, from which it will appear that incisions may sometimes be necessary and useful, to give us an insight into some diseases the nature of which we cannot readily determine, and also to relieve the symptoms attending them. A young woman had received a blow on the patella, from which she experienced much pain, and which in process of time, was augmented to such a degree as to deprive her almost entirely of the use of the leg. When she first applied for advice, namely, about six months after the accident, there was a small elevation of the skin about the center of the patella, in which a very small quantity of fluid was evidently contained, and the surface of the patella itself felt in general rough and uneven, the ligamentous parts cracking as it were under the finger, as they always do when labouring under the effects of contusion. When she came into the Westminster Hospital, which was about three weeks after her former application, I found upon examination that the fluid had been absorbed, but the complaint still existed as formerly, and the distempered feel, if I may so call it, of the patella, was exactly the same. As the external appearances, however, were not such as to enable me to account for the importance of the symptoms, I was willing to try every possible mode of relief that topical applications could supply, and

therefore had recourse to warm and stimulating fomentations and embrocations, and to pressure; but none of these answered any good purpose. At length, wearied with these ineffectual endeavours to relieve the patient, and concluding that there might possibly be some mischief brooding about the patella, I made an incision upon it down to the ligament, in hopes, at least, of discovering the nature of this mysterious complaint, and of being able to apply the proper remedy. This opening led me into a small cavity in which I could find no other disease, except a few globules of hardened fat, which seemed, as it were, to be insulated from the rest of the adipose membrane. I thought it necessary to dissect these out wherever I could feel them, and I then kept the wound a little open in order to excite a degree of inflammation, for it struck me at the time, that this had been originally an attempt of nature to form an abscess here, which, for want of sufficient vis vitæ in the habit, had proved abortive; and that the cavity which had at first contained the fluid, had still remained after the fluid had been absorbed, and I was confirmed in this idea by the pale, weak, and languid countenance of the young woman. Two or three days after this operation, a small abscess was formed upon another part of the patella, at the distance of about half an inch from the former incision. This matter I gave vent to with a scalpel, the pain is now greatly diminished, the use of the leg returning, and every thing seems to promise a speedy, and a fortunate termination of this unaccountable disease.*

ABSCESSSES WITHIN THE JOINTS.

If it be necessary to open early and freely in abscesses seated in the external parts surrounding the joint, this necessity becomes still more absolute and indispensable when the pus is originally formed *within the cavity*. We must therefore make one or more incisions through the capsu-

* The author's papers do not supply any farther information respecting this case, the particulars of which were committed to paper before the event could be finally ascertained. H.

lar ligament of the joint, in order to give a free vent to the pus, whenever we have any reasonable ground for suspecting that it is collected there; and we must more especially avoid waiting till the signs of suppuration are manifested externally. Without this precaution, the matter destroys entirely the cartilages covering the extremities of the bones, penetrates into their substance and renders them carious, before it can possibly have made its way through the strong capsular ligament, and the other tough parts surrounding the joint. Nor is the supposed danger of exposing cavities to the air, to deter us from opening the articulation in these instances; for, not to mention the various incisions that have several times been made into the joints, without producing the least bad symptom, it is evident, that the pernicious effects of a fluid destroying and corroding the parts within, must be infinitely more fatal than any that can be produced by exposure to air.

The fact, as far as I can collect from observation and experience, seems to be, that the bad symptoms which frequently arise after openings made into the joints are not so much owing to the incision itself, as to the violence of the disease existing there at the time of its being made.

It is inconceivable indeed, unless we were witnesses of the fact, how extremely rapid the progress of these articular diseases is. In less than six weeks after an accident, I have known the necessity of amputating appear, upon making an incision into the knee and elbow joints. This I have accordingly performed a few days after, when, in that short space of time, I have found all the cartilaginous surfaces both of the femur, tibia, and patella, as well as of the ulna, humerus and olecranon (where the elbow has been the seat of the disease) totally eroded, and the bones all carious. Whatever precipitation therefore we may use, it is very possible that we may still be too tardy; and it is also evident, that the sooner the fluid be let out, the less liable will the joint be to be injured; or at least the injury may not be so considerable, and may still be within the reach of our art.

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I would not however be understood to advise a wanton exposure of the articular cavities of the body; such things are not to be done without strong reasons, the validity of which no man can properly judge of who is not extremely conversant, not only with the examination of these complaints, but also with treating them himself. This rule by which the necessity of opening diseased joints early is to be determined, ought only, with respect to the young practitioner, to apprise him of the danger of temporizing and delaying, and should therefore prompt him to call in the aid of more mature experience, in order that every possible assistance the art can afford, may be timely applied, with the laudable intention of saving a life or a limb.

When we are under the necessity of cutting into any joints, I would also recommend, that every possible care should be taken, to prevent them from being long exposed to the atmospheric air. If the joint be diseased, the dressing should be applied as speedily as possible; and if the joint be not diseased, and the incision has been made into it merely to extract some extraneous body, the wound should be kept quite close with the dry future, the limb perfectly at rest, and the part not looked at, unless some bad symptom acceding should oblige us to it, till we may suppose it to be nearly united by what is called the first intention. This was the precaution I used in a singular case of loose cartilage in the knee joint which terminated favourably.

But to return to the diseased joint; when that is opened, some people advise us to pass a seton through it, in hopes of inducing a separation of the morbid parts of the bones, and a sprouting of granulations from the upper and under surfaces, so as to bring about an anchylosis or stiff joint, by the coalition of the bony surfaces. Others attempt this by injecting spirituous and stimulating fluids into the cavity. Preserving the limb with a stiff joint is certainly preferable to amputation; but the proper method of bringing about an anchylosis is still a desideratum in Surgery. Nature will sometimes accomplish this task of herself, though very rarely; but I have not been so happy as to find the efforts of art successful

in these attempts. Where the joint is but slightly affected with disease, the parts will sometimes recover themselves; but where the joint is thoroughly diseased, we have little resource left but in amputation, which, by the way, confirms still more the necessity of early opening in these deplorable cases. Counter-openings are as absolutely necessary here as in the abscesss on the outside of the joint; and it is often proper to make more than one, though that is generally sufficient in the other case.

Abscesses are sometimes formed under the periosteum, and wherever we have reason to suspect that this is the case, the necessity of early opening will be evident, from what has been already said of the treatment of the fourth species of paronychia, and from the immediate relief which, in those cases, ensues from letting out only a drop or two of purulent sanies. The particular parts in which we are most likely to meet with this abscesss, are the tibia and the cranium, where, the membrane being nearer to the surface of the skin, is more liable to external injury, and therefore to inflammation and abscesss. The nearness of the part to the skin also prevents us from mistaking the case in these instances, so that the fluctuation of the matter is evidently, though perhaps obscurely, felt.

We must not be satisfied with a simple incision here, but must divide the periosteum freely, throughout the extent of the inflammation, or else the disease will go on after the abscesss is opened. Thus, in injuries of the scalp, I have often seen the matter make its way for a considerable extent through the pericranium over the surface of the skull, frequently bringing on a caries of the bone, all which mischief is effectually prevented by a large and free division of the scalp and pericranium, even beyond the place to which the injury or inflammation seems to extend. With respect to abscesses forming in the body or substance of the bone, though the same necessity of opening early would hold good to prevent the farther progression of the mischief, yet the signs are so equivocal, that we can scarcely ever expect to be sufficiently assured of this circumstance to

to warrant us in making an opening into the bone and letting out the matter, till the disease has made its appearance outwardly.

This point would lead us to the mode of treating diseased bones, which, though a material part of operative Surgery, does not come within the limits of our present plan. We shall therefore proceed to speak of other abscesses happening to different parts, both external and internal, and of the treatment of several other kinds of tumours which may affect the machine.

PSOAS OR LUMBAR ABSCESS.

The abscess next to be considered, is that which is called, though improperly, the *Psoas Abscess*, but which in fact is originally a caries and abscess of the vertebræ of the loins, and therefore may be termed the *lumbar abscess*.

This abscess manifests itself either by a tumour on the inside of the thigh under Poupart's ligament, or externally on the side of the foramen magnum Ischii, but much more frequently in the former place. This is the state in which we generally see this deplorable disease, which, in the ordinary mode of treatment, is most commonly fatal. It is wonderful to observe from what apparently trifling beginnings this disease frequently originates. It is very often the effect of a counter-stroke received by a fall on the nates, or a violent shock on the feet in jumping, in which case, the vertebræ of the loins are the parts on which the shock must necessarily fall; and the disease is so slow and so insensible, as it were, in its progress, that it is only from very attentive experience we can be able to discover its tendency.

It is upon this ground, that I would propose the probable means of stopping its progress, if we are happy enough to discover it in the first instance, and the best mode of treating it when it is far advanced. In
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order to make the whole of my doctrine, upon this important point, evident, let me trace the progress of the disease from the beginning, and shew the effects which attend the usual mode of treating it. In a short time after such shocks as I have been describing, as also after violent and painful efforts to raise too heavy loads, the persons who have been exposed to these accidents, complain of a dull pain in the region of the loins, accompanied with a difficulty in walking, or a lameness and hitch in the gait. These complaints increasing gradually, without ever causing any very acute pain, end at length, in so great a debility of the spine, that the patients are no longer able to support themselves, but are obliged to keep in bed. The thigh in some instances, grows wasted and extenuated, and a pain is felt from the loins to the inside of the thigh, with a foreness to the touch, precisely in the direction of the tendons of the Psoas and Iliacus internus muscles, where the matter is probably attempting to pass.

At this period, which is at the distance of from six, to nine, ten, or more months after the accident, we generally begin to perceive a tumour which most commonly makes its appearance, as we before observed, on the inside of the thigh, just below Poupart's ligament, and which increases slowly, without being painful to the touch. When the tumour has acquired a certain size, and the matter which forms it is sufficiently advanced towards the skin, a manifest fluctuation is observed in it, which seems to furnish a positive indication for the opening of it.

The Surgeon therefore thinks himself obliged to open the tumour, and this he generally does largely; and giving issue to a large quantity of matter, which has been confined for a long time, he now imagines that he must have contributed to the advantage of his patient. But let us trace the fatal change which soon takes place, and we shall be convinced of the contrary.

The patient, who for some months past had experienced no evident degree of fever, who suffered but little, who had perhaps preserved his

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appetite,

appetite, who slept, and who had complained of no other symptom but that he could not keep his back upright, is far from being relieved by this operation; at least if he be, the relief is not of long continuance; for the matter forming the tumour, which, at the time of the opening, was as white as milk and perfectly devoid of smell, soon contracts a considerable stench, and becomes intolerably offensive; a fever comes on, the pulse becomes quick and small; in a word, a hectic supervenes, and the patient dies not unfrequently towards the thirteenth day. Sometimes indeed, patients in this disease may live longer, but they only drag on a miserable existence, and a fatal termination almost always succeeds.

Upon opening the body after death, a caries of two or three of the lumbar vertebræ, and often of part of the Os sacrum presents itself to our view; and from seeing so much mischief, the Surgeon is far from suspecting that the dissolution of the patient has been hastened by his management.

It is proper however to observe, that the patient had lived several months, without any considerable inconvenience, with this caries and this tumour. Though it contained a large collection of matter, his state would not have been so suddenly changed, if an opening had not been too precipitately made. We shall be convinced of this by attending to what happens when these tumours are left to nature. If they burst of themselves, the opening is made much later, and in this case the matter preserves its original mildness and inoffensive smell much longer, or perhaps is never altered. If however it should alter, it does not happen so soon as when the abscess has been opened; and though some alarming symptoms should come on at this period of the bursting, they are much less rapid in their progress, and seldom rise to such a height as when the opening has been made by art.

The reason of this seems to be, because nature procures no more than a very small issue to the matter, and that too in her own way, by which perhaps the easy introduction of atmospheric air into the center of the cavity,

cavity, where her operations are still going on, (and which in these cases, seem particularly apt to be disturbed,) is greatly impeded. If the patients die too, when nature makes the opening, they perish much later than in the other instance.

This difference in the event of the disease, and these ideas which were first suggested to me from a very ingenious performance of my friend, M. DAVID, Surgeon of the *Hotel Dieu* at ROUEN; and having also seen the good effects of his doctrine applied to practice while I was in that city, have taught me never to meddle with lumbar abscesses, nor to apply any thing to them that may tend to hasten their bursting. Whatever may be the size of the tumour, and however pointed the fluctuation from the matter endeavouring to form itself an issue, it is a rule with me, never to employ a cutting instrument, nor to open them by caustic. I have repeatedly desired my professional friends to take notice of the event of these cases, and to compare it with that in others, where the opening had been made by art. These gentlemen can witness that in every instance they have observed the same thing; that is, when these tumours have been opened by art, the matter, at first totally bland and inoffensive, has become, upon the third or fourth day at farthest, most abominably foetid; but, on the contrary, when they have been suffered to burst of themselves, this unfavourable event has not taken place.

I do not say that all patients infallibly die by the first mode of treatment; nature and the strength of the constitution sometimes get the better of the disease, and convey our patients safely through the very imminent risque of life to which they are always exposed. Nor will I, on the other hand, affirm, that patients will always recover by leaving the case to nature.

Thus far I can venture to say, that out of four cases which I have treated within these four years, but one has proved unsuccessful. One of these lasted for above two years; repeated openings formed in different parts of the thigh, both externally and internally, from which the

patient suffered much at intervals, and was exposed to some alarming symptoms. I was obliged to make use of all my persuasion, to prevail upon the mother of this child not to have any thing done, but to leave the whole to nature. I spoke so strongly however, that she at last complied with my wishes, and by observing to keep the patient as much as possible from motion, she perfectly recovered from one of the worst of these cases I ever saw. Another instance is that of a young man, whose complaint also lasted a very long time. It was opened by nature, under Poupart's ligament, and as there was a large quantity of matter continually attempting to burst forth, yet unable to force its way through an opening so very small, (from which the patient suffered much pain,) I introduced a small piece of gentian root into the opening. He was relieved by this, and I had then an opportunity of injecting and cleansing the cavity of the abscess with myrrh water; from which, in this long treatment, he experienced much advantage. At one period of the disease, there was so large a piece of exfoliated bone presented itself at the orifice, that it was with much difficulty I could extract it, although the orifice was full large enough to admit my finger. This patient recovered perfectly, as indeed the visible improvement of his health had previously indicated.

The unsuccessful case, out of the four instances I have mentioned, was one, where the tumour was external upon the buttock, and of an immense volume: and indeed, I have in general observed, that those lumbar abscesses which burst externally, are more certainly fatal than those which burst under Poupart's ligament.

The alarming symptoms which patients experience in the course of this melancholy disease, whether it be treated by art, or left to nature, are of the feverish or hectic kind; and they usually take place at different intervals, except where an artificial opening has accelerated the progress of the complaint. It is the business therefore of the Surgeon, besides prescribing absolute rest, to understand what are the best means of counteracting these hectic paroxysms when they affect the patient. The Bark

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is usually thought the best medicine in such cases, and indeed the administration of it ought not to be neglected, but we shall find its powers wonderfully assisted by ordering the patient to take twice a day, ten grains of powdered myrrh, with three grains of powdered rhubarb. The antiseptic quality of this medicine will be found particularly useful in abating the violence of hectic symptoms.

The necessity of suffering these abscesses to burst of themselves will farther appear from considering, that this spontaneous opening seems to be an extreme resource of nature, to which she is rather compelled from the incumbent weight of a great quantity of fluid. It should seem to be a termination by no means consonant to her wishes, since, whether it happens by her own process or by art, it always excites alarming symptoms, though in a less degree in some instances than in others. But, before the period of bursting, no alarming symptoms of hectic, such as happen afterwards, are observed; and the chief symptom then is debility and inability of motion, which naturally lead to the grand intention of cure, absolute rest.

This I shall illustrate by two cases, one recorded in the performance above mentioned, and the other supplied by my own practice.

“ A young woman of twenty-two years of age,” says M. DAVID,
 “ having fallen down stairs, felt, for a considerable time, a pain, more or
 “ less acute, in the region of the loins, and was likewise gradually
 “ seized with a weakness in that part, which, in a short time, prevented
 “ her from walking, and even from supporting herself. At this period of
 “ the disease she applied to me. Revolving in my mind these symptoms
 “ and the cause that had produced them, I imagined her case to be a
 “ disease of the lumbar vertebræ, and the best means of cure that could
 “ be prescribed, were rest and lying in bed. I explained to her the im-
 “ minent danger of her situation, and engaged her punctually to follow
 “ my advice. This she did very exactly, by going to bed, and remain-
 “ ing there constantly, taking care to exert as little motion as possible,
 agreeably

“ agreeably to what I had recommended. Notwithstanding these precautions,
“ the disease continued to advance. The weakness of the loins, and the
“ pain she felt there upon motion, were accompanied with a tumour which
“ began to make its appearance under Poupart’s ligament. This became,
“ in process of time, as large as one’s fist; and at length manifested an
“ evident fluctuation. Warned by the melancholy end of those in whom
“ such tumours had been opened, I carefully avoided applying any thing
“ that might hasten the bursting of it, and abstained still more religiously
“ from opening it with a cutting instrument. This tumour with fluctua-
“ tion, after having acquired its full size, remained nearly in the same state
“ during four months, and at that period began to be insensibly dissipa-
“ ted; so that in four months after this, there remained not the least
“ vestige of it. The patient felt, from one week to another, that the
“ spine was recovering its former strength; she began to sit upright in
“ her bed, while her back was supported; she then made a shift to walk
“ with a stick; and was at length capable of walking alone, and unsup-
“ ported, with as much firmness and confidence as ever. But this happy
“ termination of the disease, was owing to her persevering near a twelve-
“ month in keeping her bed, and in a state of rest.”

This, it must be allowed, is a great lesson in Surgery, and one which the judicious observer will not fail to apply to practical advantage. It invites him to contemplate the course of nature, and teaches him to suspend the usual exertions of his art, whenever they are likely to disturb her intentions. It shews him a large collection of matter, to the evacuation of which, in conformity to the most received and soundest principles of the science, he would have proceeded, as soon as the fluctuation had been evident; apprehending, that a longer confinement would produce mischief. Yet we see, that this same matter, after having been collected in a large quantity and in a distinct cavity for several months, was received again into the course of the circulation, without occasioning the least inconvenience; and that the principal disease produced by it, was cured without the assistance of art, otherwise than in enjoining the patient a long and persevering abstinence from motion.

Let

Let us now investigate, and endeavour to explain, in what manner this great effect has been brought about. The disease exhibits to us, in the first instance, a disturbance of the organization in the bodies of the lumbar vertebræ, by means of a shock conveyed to them, or a forcible divulsion of the ligaments that unite them. The swelling of the parts being the consequence of these first accidents, and a slow inflammation coming on, this at length causes a suppuration, and an abscess, which forms in the neighbourhood of the parts first affected.

The organization of the bodies of the vertebræ being depraved, it follows, that small separations or scales must be thrown off from these bones; which circumstance is accomplished as much by the organic action of the inflamed parts as by the matter they furnish. The matter itself, after having been efficaciously employed in separating the corrupted from the sound parts, is also the medium or agent to which nature intrusts the care of expelling and carrying them out; but this purpose is effected very slowly. Bony fragments, of greater or less dimensions, being detached by means of the matter, float in that liquid, to which they present a greater extent of surface, in proportion as they are more divided. The pus itself in which they are steeped, becomes a menstruum proper to dissolve them, and its quantity increasing in proportion to the continuance and extent of the suppuration that separates the loose piece of bone, it at length makes a passage for itself towards the depending parts, and those which afford the least resistance.

But the matter, still sheltered from the external air, and undergoing no change, produces no mischief in the parts that contain it. The fragments of bone which float in this quantity of pus, may at length be totally dissolved in it, so as to form an homogeneous mass, which perhaps may not then in any wise differ from our most elaborate nutritive juices. This being premised, we need not be astonished, if nature, after having, at this period, employed the pus as a menstruum to dissolve the bony fragments to the separation of which it has contributed, should resume it into the general course of the circulation, by taking it up from its cavity

vity, through the means of the several absorbent openings on the surface of that cavity. The return of the matter being then effected as slowly as its collection was formed, the parts which compose the cavity must return to their proper state, as gradually as they were disturbed from it, without accident and without inconvenience.

With respect to the bones that are primarily affected, and which have almost adopted the nature of flesh, during the long and important process of exfoliation, no sooner are they disengaged from these loose pieces than they begin to recover their solidity; and if several vertebræ for instance, have partaken of the injury, they form among themselves a common mass of ossification that in some measure supplies their bodies, and terminates this great case, which, as we have observed, can only be the work of nature, time, and rest.

The infinite importance, as well as novelty of these doctrines, induces me to confirm them still more by an account of the case before alluded to, which happened under my own observation at the Westminster Hospital. I never could account satisfactorily to my own mind for the cure of this case; and in the conducting of it, I candidly acknowledge, that I was far from being guided by those great and new ideas of my friend concerning rest, which I have since adopted with so much advantage.

A young woman, seemingly healthy in other respects, came to the Hospital, with a tumour nearly as big as two fists, on the upper part and towards the inside of the thigh. There was not the least discolouration of the skin, nor any fluctuation. It was however the opinion of all the Surgeons present, that it contained some fluid, and that there was an abscess seated underneath the fascia, which time would bring forward. Though there was some pain attending this tumour, yet that was inconsiderable, and the patient was rendered unable to walk about with it, rather by debility than any other apparent cause. Though the swelling was somewhat lower than the spot where the lumbar abscess usually makes
its

its appearance, yet, for my own part, I could not help suspecting the case to be of that kind, more especially as it was accompanied with some pain in the loins. I cannot indeed even now take upon me to say that it was so. The fact is however that the tumour remained for six weeks or two months exactly in the same state, the patient keeping her bed constantly, not indeed from any direction of mine, but merely from her inability to motion.

I saw, or perhaps fancied that I saw, a small diminution of the bulk of the swelling, and thinking it then likely that it might be dispersed, and there appearing to me no reason against this termination, I endeavoured by outward applications to forward what now appeared to me to be the intention of nature. I therefore caused some compresses, dipped in spirits of wine and camphor, to be applied to the swelling, and directed these to be maintained by a pretty long bandage rolled moderately tight on the swelling, and on the whole limb. By this method, and by the patient's continuing still in bed for a time, I had the satisfaction to see this large tumour gradually disappear. It was entirely gone, in about five months after her admission into the Hospital, and the limb was restored to its natural firmness; so that the patient went out perfectly cured of a complaint, the true nature of which had never been known, but which from its size, situation, and the debility attending it, seemed to threaten a much less favourable issue, than that which was thus fortunately brought about. It is probable that this case was of the same nature as that of the young woman quoted from the fore-mentioned essay, but not so far advanced; and we may presume that rest was, in this instance also, the principal agent that effected the cure.

ABSCESSSES

* The generality of lumbar abscesses may be traced to the causes pointed out by our author, as well from the violence which the diseased part may have immediately suffered, as perhaps from a determination of constitutional indisposition thereto. This latter is more especially the case in such instances of the disease as have originated from very trivial accidents, and hence, in scrofulous habits, we may expect it to advance more rapidly.

Where, then, the first cause appears to have been a degree of violence which simply weakened the part, the mode of cure by long-continued rest seems highly deserving of our attention;

ABSCESSSES OF THE ABDOMEN.

We now proceed to abscesses formed either without or within the cavity of the abdomen.

With respect to the former, or abscesses formed under the fascia of the abdominal muscles, we have already pointed out the necessity of opening them as early as possible, in order to prevent the matter from piercing the peritoneum, and penetrating into the cavity of the abdomen.

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tion; but where there is likewise reason to apprehend the existence of a specific disease, the case certainly claims other assistances to diminish or counteract the force of these combined causes. Hence the exerting a different action, as near the part as possible externally, by means of setons, caustics, &c. promises to be attended with every advantage.

The early stage of this complaint may be remarked by a particular debility in the region of the loins, attended internally with some occasional pains or uneasiness in the bowels near the same part. The motion of the thigh and leg on the affected side, is frequently impeded by a want of its usual progressive power, particularly in walking over irregular ground, or going up and down stairs; to which we may add, an occasional dragging of the limb, even over a level surface. The pulse is in general quickened, and as the internal affection makes its progress, the glands in the groin of the affected side become enlarged in various degrees. When this latter appearance has existed for some little time, the upper part of the thigh is soon found to increase in size, particularly on the inside; and in the course of a few weeks, a fluid may be more or less distinctly perceived. This is found to accumulate very fast, and in proportion to the resistance it meets with in the cellular membrane, becomes more or less confined, forming a projecting tumour anteriorly, or diffused, passes between the muscles so as to bring on a general enlargement of the thigh; or forcing its way towards the nates, it has been known, on many occasions, to burst near the rectum, forming sinusses all round the lower part of the pelvis. In two female cases, I knew it escape at the labia pudenda.

The invariable ill effect of openings made into these tumours to discharge the fluid, which is by much more frequently a kind of curds and whey, than a thick true pus, (or as the author has stated, page 122, *white as milk*) are too well known to require any farther comment,
and

But there is another circumstance also to be attended to. The integuments of the abdomen are so loose, that it will not be sufficient to open the cavity of the abscess in its whole extent. We must likewise lay open any sinusses that may accompany it, whatever may be their extent and direction. There is no opportunity here of curing the sinus by means of compression, as may be safely and properly done in other abscesses, where

and very few are the instances, I believe, to be depended on, of a cure from a spontaneous giving way of the integuments, though it is certain the patient lives much longer in that case, than where a free opening has been made by the Surgeon. The effects therefore to be expected from a state of absolute rest, as proposed by the author, certainly demand our particular attention.

From such circumstances however, as have fallen within my own observation, I am led to suspect, that many abscesses in this part which have been considered as deposits from the loins, and cured by free openings, have been merely suppurations from enlarged glands under Poupart's ligament, or in the course of the psoas muscles. In dissections, I have frequently met with glands, in these situations, of very considerable size.

But several instances have happened where the matter, collected very largely in the upper part of the thigh, under every preceding symptom of a lumbar abscess, has been absorbed; in some without any knowledge by what outlet it passed off, in others where it has appeared in and been deposited from the urine in a most foetid state. Some of these patients remained well ever after. Others have fallen into a decline at some distance of time; and in one instance where the tumour was of an enormous size, and the fluid entirely absorbed, the man continued well for seven years, when it returned again. The tumour at length broke, and the patient, as is usual, sunk under the discharge.

As it is obvious, in considering these facts, that great advantage would be derived from any means of promoting the cure by absorption, may not mercurial frictions (from the known peculiar action of mercury on the absorbent vessels) be well worth joining to the author's plan of rest? Some good effects have been observed on a trial of this remedy; so that a farther attention to it seems highly worthy to be recommended. It may perhaps be objected, that mercury cannot long be confined to its topical action, and that when its powers are exerted on the system, as must sooner or later be the case, the hectic symptoms will probably be aggravated. But experiment only can decide this, and considering in how large a proportion are the number of victims to this disease, to those who recover from it by the present mode of treatment, we are certainly justified in making trial even of an hazardous remedy. H.

the situation of the sinus, according to the rules we have formerly laid down, is favourable for such an attempt. This rule however, of opening all the sinusses of external abscesses in abdominal muscles, is not wholly without its exceptions.

Abscesses or extravasations of fluid, either diffused into the cavity, or formed in some of the viscera, are cases very frequently mortal, owing in a great measure to the difficulty of ascertaining their existence.

If great tension and swelling of the belly subsist after gun-shot or other wounds, and continue for a length of time, or come on at some distant period; these may be reckoned the leading signs of evasated fluids in the cavity. These collections of matter though recent, have been found, after death, not absolutely flowing loose in the cavity, but confined to a particular pouch or cell of their own.—A small opening in the peritoneum, is sufficient to give vent to the fluid. Where the abscess is seated in the intestines, it seldom distinctly manifests itself, till by an adhesion formed to the peritoneum, about the spot where the abscess makes its appearance outwardly, it, at length, bursts through the integuments.

ABSCESSSES OF THE LIVER AND GALL BLADDER.

The most frequent of the abscesses that happen within the cavity of the abdomen, are those which are found to exist in the liver and gall bladder. Negroes are known to be remarkably liable to the former. Writers upon this subject say, that the abscess of the liver may be formed in any part of the epigastric region; but this does not agree with my observation, for in all the cases of abscesses of the liver which I have seen, the tumour was always situated anteriorly, under the margin of the thorax, by the side of the linea alba, between that and the part where the gall bladder is placed.

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If, on the contrary, matter be produced in the gall bladder itself, it is evident that the tumour will be formed at the spot where the gall bladder is naturally situated; and this we know to be at that part which is called the thin edge of the liver, at some distance from the linea alba; so that if we see a swelling formed at that particular spot, with an evident fluctuation, we must be very careful in endeavouring to distinguish whether it be an abscess in the liver or gall bladder, or merely a preternatural distention of the gall bladder with bile.

The former tumour or abscess is always accompanied with adhesion, on account of the preceding inflammation, and therefore may be opened with safety; and indeed this step is absolutely necessary to be taken. But in the latter tumour, which is nothing more than a mere preternatural distention of the gall bladder with bile, there is no adhesion; so that an opening into the gall bladder will occasion an evacuation of the bile into the cavity of the abdomen, and therefore will always prove fatal. Many mistakes of this sort have been committed, and are upon record. Though it be a task of some difficulty, let us endeavour to ascertain how these errors may be avoided.

In the first place it must be observed, that all abscesses either of the liver or gall bladder, as well as retentions of bile in the latter, are in the beginning attended with much pain, colicky spasms, and other symptoms of inflammation. We must therefore, in the first instance, carefully attend to the common signs of the formation of the pus, such as have been already laid down.

The existence of the tumour after the remission of the symptoms, is one of these; but in such cases particularly, this sign being somewhat equivocal, (because it may be equally attendant on the resolution as on the suppuration of the tumour,) it is to be observed,

First, that supposing the pain equal in the first stage of the disease, it will have increased while the abscess was forming, and, on the contrary,

will have diminished while the resolution was going on, and that the bile was accumulating in the gall bladder.

Secondly, the pain accompanying suppuration, is usually attended with pulsation; a symptom which does not attend tumours of the gall bladder, unless they be of the abscess kind.

Thirdly, the pain diminishes much more rapidly when the tumour terminates in resolution than in suppuration; in the latter instance it is only a remission of symptoms, in the former it is a total cessation of them. And lastly, the cessation of pain in consequence of resolution, leaves the patient perfectly at ease; while the diminution of pain, in consequence of the pus being formed, still leaves the patient in a state of languor and uneasy sensation.

In the abscess of the liver or gall bladder, the swelling is most frequently accompanied with an œdema of the skin; a symptom often attending, as we have before observed, deep seated abscesses.

If the tumour appears in the region of the gall bladder, there are still further and less equivocal signs to determine whether it be adhering or not. We must carefully handle the tumour, and perhaps by pressing it in various directions, we may be able to make it partially disappear, in which case, there is no adhesion.

If the point cannot be determined by this experiment, we must place the patient on his left side, with his thighs bent and pushed up towards the belly; and if, in that case, we cannot diminish or remove the tumour from the place where it projects, and besides that these signs are accompanied with all those we have before mentioned, we may venture to conclude that the swelling of the gall bladder is phlegmonous, and therefore accompanied with adhesion.

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In this case, we are to open the tumour throughout its whole extent, as far as the adhesion will permit; and then pass a probe or proper searching instrument into the gall bladder, in order to discover whether there be any gall stones collected in it, by which means we may extract them, and cure the disease without leaving any fistulous opening.

In abscesses of the liver, as well as in all internal abscesses of the viscera, if we are reduced to the necessity of making an opening, we shall always find it absolutely necessary also to make that opening large; for besides the great size of these abscesses, the quantity of the matter they contain, and the impossibility of acting upon them by compression, we shall likewise find that the pus they contain, is always of a very viscid nature, so that not only it cannot be evacuated by a small opening, but we shall also find it necessary to dilute the matter by injecting the cavity of the abscess, or to separate the strings of coagulable lymph, which are in general found sticking to the inside of the cavity.*

We shall conclude this essay with an account of other tumours affecting the machine in general, which though not to be ranked among the class of abscesses, are not wholly unconnected with the subject.

ANTHRAX, OR CARBUNCLE.

Of these the first that presents itself to our consideration, is the Anthrax or Carbuncle, a dreadful tumour, which, although it frequently

* The original manuscript proceeds thus—"This observation holds equally good therefore with respect to the empyema or abscess in the chest; but we shall postpone the farther consideration of that disease, till we come to treat of the operation peculiar to it. So we shall treat of the quinsy or abscess of the tonsils under the operation of bronchotomy; of the abscess round the rectum, and in the perinæum, under that for the fistula in ano and perinæo: and of the abscess beneath the cranium under the operation of the trepan." It is to be regretted that the author's papers do not afford matter to complete the subject of abscesses, so far as relates to the points here spoken of. H.

contains matter, is still very different from an abscess; since the matter is extremely different from that bland fluid which we call laudable pus, and which we find in a well-formed abscess.

The Anthrax is a putrid, not an inflammatory tumour, as it has been reckoned, since it has many characters which clearly distinguish it from the true inflammation or phlegmon, and which render it much more similar to the erysipelas, or what we have called the spurious inflammation.

It is a hard circumscribed tumour, seated in some part of the cellular or adipose substance, accompanied with a violent sensation of burning heat, instead of a throbbing or pulsative sensation, and attended with, and surrounded by, a discolouration of the skin, which instead of being red, as in the true inflammation, is of a livid purple hue, and has most commonly one or more black spots upon its surface. It is a peculiar character of this disease, as well as of the erysipelas, that the patient is always very languid, and the pulse so low, that it is very difficult to raise it by the freest use of the most cordial remedies.

It has been the practice of some Surgeons to treat this disease by extirpation; but nothing surely can be more injudicious than to attempt to stop the progress of a disease so nearly allied to gangrene, by an ill-timed operation. Our chief dependence should be on the exhibition of medicines internally. The bark in large quantity, opium, and proper cordials, as Madeira wine, &c., should be given. Externally, to the part, lime should be applied, and all round it lint moistened in vinum chalybeatum. When the tumour is of the red kind, and breaks in several places, we may very properly dilate these orifices, and lay them into one; but our incisions should extend no farther than just to remove the slough, without penetrating the sound parts.*

ENCYST-

* In several cases of this disease, I have seen extraordinary good effects follow the use of a poultice, composed of fermenting materials, calculated to generate *fixed air* in large quantity.

ENCYSTED TUMOURS.

We now come to the consideration of encysted tumours, or tumours containing fluids different from pus, and inclosed in a bag, or cyst, and which may be formed in any part of the cellular membrane.

Authors have divided these into three kinds, from the difference of their contents; the *Meliceris*, the *Atheroma*, and the *Steatoma*.

The *Meliceris* is an encysted tumour, containing a half transparent fluid, resembling honey in colour and consistence; the contents of the *Atheroma* are like a bread and milk poultice; and those of the *Steatoma* resemble suet. From the difference in these fluids, and in their consistence, it is evident that the feel of them will be very different, and that

tity. This cataplasin is known to most Surgeons, and consists of a mixture of oatmeal with strong infusion of malt. To this, when cooled to the degree most favourable to the intended process, is added a spoonful or two of yeast. This is one of the most effectual and easy modes of applying fixed air topically.

The author has not sufficiently explained *in what way* the lime is to be employed. If he designs it as a *caustic* he very probably follows the ideas of CÆLSUS, who advises the free use of the *æstual* cautery.

It should also have been observed that the degree of danger attending a carbuncle depends greatly on the part of the body attacked by it. On the head and face it is generally mortal. On the neck it is likewise exceedingly dangerous. But in the back and lower parts of the body, it is a common circumstance, when proper care is taken, for the patient to recover. In such cases the mode of treatment should be much the same as that of a common furuncle; and should consist of emollient poultices with the previous inunction of camphorated ointment. A carbuncle on the head or neck is, with great difficulty, brought to suppuration, and hence the disease soon becomes highly malignant and dangerous. H.

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although a degree of fluctuation may be felt in each of them, yet this will be more obscure in the Atheroma than in the Meliceris, and still more in the Steatoma. Whenever we see, however, any tumour formed in any of the superficial parts of the body, increasing gradually almost without pain, entirely without discolouration, or any other symptom indicating suppuration, and in which we feel a fluctuation, we may conclude it to be a swelling of one of these kinds.

They are perfectly devoid of danger, and generally very small in their first appearance; so that although there be, in general, little hope of succeeding in our attempt to cure them by resolution, yet the attempt may be made properly and with safety. The best application for this purpose, is either crude sal ammoniacum dissolved in an aqueous or spiritous menstruum, and applied to the part; or the volatile spirit so far diluted as to prevent it from fretting the skin. These applications may likewise be assisted by pressure, where the tumour is in any part that will admit of it, and I have known these means to succeed in some few instances, in an early state of the disease. I have also now and then, cured the little encysted tumour that happens frequently in the skin of the eyelids, and which I have always found to be a Steatoma, by the application of mercurial ointment.*

We may therefore, unless they should acquire such a volume as to prove troublesome, wait with safety to observe what turn these tumours will take, although they will not yield to resolute means; for the cysts will sometimes fall into suppuration, particularly that of the Meliceris, and will come away by a simple opening of the skin.

* I have lately succeeded perfectly in the cure of one of these tumours on a lady's eyelid, by the use of mercurial ointment with camphor. It was thought necessary, however, to employ a much stronger composition than that of the London Pharmacopœia, since its discolouring the part, necessarily prevented its application at any other time than in the night. I am inclined to think that the early application of this remedy would prove more successful than any other, in incipient tumours of the encysted kind. Many of them, it is said, have been removed by electricity. H.

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At all events, the cyst must be entirely destroyed, by some means or other, before a cure can be obtained; so that if after simply opening them, the cyst does not slough away with the suppuration, it will be necessary to destroy it by escharotics, more or less powerful, according to the degree of thickness and indolence which the bag may have acquired. The cyst of the Atheroma is often found extremely hard, so that it becomes necessary to extirpate the whole of this swelling together; and this will be found, in almost all cases, by much the most expeditious, as well as most certain mode of proceeding.

In the small Steatoma that affects the eyelids, it will generally be necessary, carefully to dissect out the whole tumour with its cyst. But, in cutting through the skin at the forepart of the tumour, we shall find it extremely difficult to avoid puncturing the cyst itself, which is usually very thin here; and if we do this, the fatty matter will ooze out, and make it very troublesome for the operator to get completely round the disease, so as to extirpate it entirely. In dissecting the back part of the tumour, we must take care to avoid cutting through the internal cartilaginous border of the eyelid, which, though not a dangerous circumstance, will give a good deal of pain, and excite more inflammation than is necessary.

When these tumours manifest themselves upon the skin of the scalp, where they are seldom solitary, and where they are in general very hard, they yield to nothing but complete extirpation.

W E N S.

The Wen, or tumour of fat, which may also happen in any part of the body, and which modern writers have considered in the class of encysted tumours of the steatomatous kind, is, in my opinion, a very dif-

ferent disease, and requires a very different treatment. It is, to all intents and purposes, nothing more than a tumour, or increase of the volume of the fat in a part. It is therefore perfectly solid, having no kind of fluctuation, as we have observed is the case with encysted tumours, and is much more moveable and loose than they are ever found to be. Besides, these tumours have another distinction which respects their treatment, they never terminate as the others do, in suppuration; at least, I never saw an instance of it.

Pressure applied, when they are as yet small, so as to compress the fat which already distends them, and to oppose the farther increase of its bulk, I have known sometimes, though rarely, to be effectual. When that fails, there is no other remedy but extirpation. It is surprizing to see what an immense volume these wens will sometimes acquire. I have taken off some of them, which when separated from the body, have compleatly filled a large wash-hand basin.

There are three ways suggested for extirpating or destroying these tumours; namely, by caustic, by ligature, and by the knife. The use of the first is entirely inadmissible, unless the swelling be very small, so that a single application shall be sufficient to destroy the whole of it at once. If this be not effected by the caustic, it is apt to be the means of setting up an irritation in the part, which makes these tumours degenerate into cancerous ones, to which, too frequently, they have, of themselves, a tendency.

Again, it is pretended by some, that when the basis of a wen is very small, in proportion to its bulk, (which, by the way, seldom or never is the case) it may easily be extirpated by a ligature passed round it. But this, at best, is a very painful mode, and what is worse, most commonly proves unsuccessful; so that it puts the patient to very great torture to no purpose. It very seldom happens, indeed, that patients apply for relief, in these cases, till the wen is grown by much too large for this mode of extirpation to be in the least adviseable. They bear the disease
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for a great length of time, whilst its growth continues without much inconvenience, and at last are only induced to obtain assistance in consequence of the increased bulk, and unmanageable weight of the tumour; except it happens to be of a cancerous nature, in which case it becomes very painful.

These wens ought never, therefore, to be extirpated by ligature, unless they be of a pyriform shape, that is, small, and hanging only by a slender stalk, in which instance we may comply with the apprehensions of timorous persons, and substitute the ligature for the knife.

I saw an absurd attempt once made by an empiric, to tie one of these enormous wens, situated on the belly of a woman, and the basis of which, measured at least fifteen inches round. He had been at this work about a fortnight, when, although he had assisted his ligature with escharotics, he had got no farther than about a quarter of an inch into the whole circumference of this immense tumour. The poor woman's tortures were, all this while, inexpressible, and she had only abstained from sooner applying to me, through the shame of having put herself into such improper hands. I immediately extirpated the whole with the knife, and dissected it from the tendons of the abdominal muscles, to which it was fixed for a considerable extent. The operation was much more painful to her, than if she had submitted to it in the first instance, because of the great inflammation raised upon the surface of the abdomen, in consequence of the previous treatment, and which might have proved fatal had it gone on much longer.

I have seen two cases of this wenny, or fatty disease, which had seized the breasts of women. In each, the breast was attacked through its whole substance, which was swelled to an enormous size, and was, by some, mistaken for cancer. But the distinction was very evident, for besides their being free from that kind of pain which distinguishes cancer, there was one remarkable circumstance attending them, which is, that notwithstanding the immense size of the breast, yet there was not
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the least swelling or induration in the glands of the axilla; a circumstance which, had the complaint been cancerous, would certainly have accompanied it.—I never saw a cancerous breast of such a size without it. One of these tumours was taken off by Mr. John Hunter, the other by myself, and both with equal success. The knowing these circumstances, is very necessary to guide us in our prognostic of such cases; for the wenny tumour, however large and formidable it may appear, never gives us reason to apprehend those mischievous consequences which but too frequently attend the other kind of disease, though ever so well extirpated.

It must, however, be observed, that these wens themselves, (though the circumstance happens very rarely) after they appear to have been fully extirpated, shall push out a fungous excrescence, which, in spite of all the Surgeon's efforts to prevent it, shall soon grow to the size of the original tumour. I have seen lately, a deplorable case of this kind, where, though the tumour was extirpated a second and a third time by the knife, and repeatedly by the ligature, while constant and persevering attempts were made to destroy and keep it down by powerful escharotics,* the patient died a miserable victim to the disease, and the torture she suffered from it. It therefore behoves the Surgeon to be very attentive to the first sproutings of this fungus, and, in the first instance, if it will not immediately give way to firm pressure, to apply the arsenical caustic to it, which, in my opinion, is the only effectual caustic, in the whole materia medica, in such cases.† I experienced the happy effects of it in
that

* I am in doubt whether the success attending *powerful* escharotics when applied to exuberant parts, should not make us hesitate to adopt the author's idea, to the extent he has urged. As far as I have seen, I have been rather led to approve of the mildest and least active caustics in the treatment of all excrescences; nay, I apprehend the class of astringents is more likely than either to afford us the means of curing these diseases. I have learned from the author to employ the *tinctura martis cum spiritu salis* with this view, and confess I have great and numerous obligations to it. H.

† The *arsenical caustic* was first recommended to the author by my friend DR. CHESTON, under whose direction I saw it very extensively used, during my attendance, some years ago, at the GLOUCESTER INFIRMARY. It consists of two parts crude antimony, and one part arsenic, fluxed

that immense wen which I extirpated from the abdomen, and where by putting the arsenical caustic upon some of this fungus, as soon as it began to sprout, I instantly put a stop to its progress.

The last circumstance remaining to be considered with respect to the extirpation of these wens is, whether the skin which covers them should be removed, or whether it should be dissected, the tumour taken out, and the skin left. It is evident that where the tumour is very large, which it is in most of these cases when Surgeons are applied to, that the idea of saving the skin is a very absurd one. In so doing, we should have a great quantity of skin, loose and detached from the body, which we should not know what to do with, and in this respect too, wens differ from other encysted tumours, the latter being seldom so very large, but that if we wish to extirpate the cyst, we may do it without removing any of the skin.

G A N G L I O N S.

The next kind of tumour I mean to speak of, is the *Ganglion*. It is a kind of encysted circumscribed swelling, either of an oblong or circular figure, which is formed in the sheaths of the tendons, and contains a glarey sort of fluid resembling the white of an egg.

These encysted tumours sometimes give way to pressure, made with a piece of lead, fixed upon them by a tight bandage. I knew an instance

fluxed together in a crucible, and when cold, reduced to powder. It is one of the most useful caustics known, being remarkably well calculated for the destruction of excrescences, as well as extremely convenient for the removal of parts, in ill conditioned ulcers, which seem to obstruct their healing. It may be reduced to any degree of mildness by the addition of opium, which, in some measure, also acts specifically in abating the violence of the pain. H.

of a gentleman who had several of them, upon the flexor and extensor tendons of the wrist, and who was cured of them, although some were very large, merely by the application of Canada balsam spread upon leather. If they will not yield to these means, the next business is to open them. I was formerly persuaded that no good was to be done in these cases, unless the whole cyst were extirpated; but, upon attempting this operation, I found it so difficult, not to say indeed impossible to perform, that I was resolved afterwards to try the effect of simple incision. This I have practised ever since, and always with success, having only found it necessary, in some instances, to sprinkle a little precipitate powder on the cyst, in order to make some part of it slough away, and procure the re-union of the rest, by the adhesive inflammation.*

R A N U L A.

The last encysted kind of tumour I shall take notice of, and which contains much the same kind of fluid as the Ganglion, is that which is called by the Latins Ranula; and by the French Grenouillette; † and for which I do not know that we have any name.

It is a little transparent tumour seated under the tongue, by the side of the ranular artery; of greater or less size, yet sometimes of such magni-

* The author has not noticed a common mode of reducing Ganglions by striking them violently, so as to burst the cyst. It is indeed, a clumsy and harsh operation, but it is more commonly submitted to than any other, and with a degree of success that satisfies the minds of the generality of patients. Electricity is particularly successful in the cure of these tumours. H.

† It seems rather to be called by the French "*Grenouille*," as appears by the following quotation from the *Manuel Lexique des mots Francois dont la signification n'est pas familiere a tout le monde*. "En termes de medecine, on nomme *Grenouille*, une petite humeur froide et visqueuse, qui, tombant du cerveau, se ramasse sous la langue, dont elle rend l'usage difficile." H.

tude,

tude, as to impede the motions of the tongue, and obstruct the patient's speech. Although this cyst be divided throughout its whole length, in order to let out the fluid, the disease will be very likely to return, unless some care be taken to prevent it. One of the modes recommended for this purpose, and which I have known to be effectual, is to mix a quantity of mel rosarum, with as much spirit of vitriol as will make it very acid, to dip a probe in this liquid, and to rub the cyst with it. I once succeeded in curing this little disease by a different contrivance. As the patient would not suffer me to put a lancet into it, I directed her to make a strong solution of alum, and dipping a piece of lint fastened to the end of a skewer, to rub the tumour smartly every day, as long as she could bear it. By following these directions, she got rid of the Ranula in a few days, though she had been troubled with it a long time; and latterly, it had grown exceedingly alarming and inconvenient to her.*

* Wiseman treats on this disease very fully. He says—"It is a soft tumour without pain or alteration of colour in the skin. It yieldeth to the impression of your fingers, but riseth upon the taking them off, and containeth a matter not unlike the white of an egg, or such as we meet with in *Atheroma*. It is also discovered by a croaking in the speech." He says the cure is difficult, that the treatment should be similar to that of *Strumæ*; but if topics prove ineffectual, then recourse must be had to the actual cautery. H.

III.

ON THE

E F F E C T S

OF

MOTION AND REST.

III

OF THE

REFLECT

ON

MOTION AND REST

THE SUBJECT PROPOSED FOR THE PRIZE
BY THE
ROYAL ACADEMY OF SURGERY AT PARIS,
FOR THE YEAR 1778.

TO EXPLAIN THE EFFECTS OF MOTION AND REST, AND THE INDICATIONS ACCORDING TO WHICH THE USE OF EITHER SHOULD BE PRESCRIBED IN SURGICAL DISEASES⁽¹⁾.

MOTION and rest are certainly two methods of cure, the rational employment of which may contribute to enlarge the bounds of surgical knowledge, since the Academy, ever intent on the improvement of this salutary art, proposes for the subject of the prize they mean to distribute, to describe their effects, and to shew the indications which direct the use of them in surgical diseases. The discussion of a question of this nature, which is more interesting than it may appear at first sight, must necessarily suggest intentions of cure, which this celebrated body alone can perceive, and the exposition of which they may, perhaps, expect in vain
from

from those who shall employ themselves on a subject so important. To treat it properly would require the united genius and knowledge of those learned men of which the society is composed; how is it possible then, that one man alone, left to his own powers, can flatter himself, that on so intricate a question, he shall be able to satisfy judges, before whom, moderate talents cannot appear without dread? This humiliating reflection would prevent me from entering the lists, were I not encouraged by the consideration of their indulgence, the inseparable attendants on learning. In granting the prize to the most skilful, they do not always despise the labours of those whom an honest confidence engages in the competition. Besides, if I have laboured unsuccessfully, my excuse will be in the greatness of the task, which, as it astonishes without discouraging me, I will proceed to exert my utmost efforts to fulfill.

The effects of motion in the animal œconomy are evident, but motion itself is an effect produced by its own causes. In order therefore to give as much clearness to the discussion of this question as it is capable of, it seems to me of some utility, to consider the source from whence motion is derived.—This may enable us to explain its effects with some precision, in consequence of which the application of them to surgical diseases, will become more methodical and certain. Such is the plan I propose to follow; the propriety of which will, I hope, appear in the unfolding of it.

It is to motion that the universe owes that life with which it is animated. Man, the epitome of the universe, discovers, in all the faculties which constitute and characterise him, the produce of an uniform and regular motion, subordinate to powers, the admirable mechanism of which will ever be unknown to us. But, without endeavouring to form conjectures concerning this mechanism, we may reasonably presume, that motion is the effect of a general active principle, dispersed throughout the universe, by that Being who created it. This principle is undoubtedly material, and among the several substances that constitute our globe, and the beings that adorn its surface, there seems to be but one that possesses

possesses in itself this property of motion; that is FIRE; all the rest are in a state of inactivity.

This active principle, united to some of our fluids, conveys motion into the machine, and transmits it by means of organs appropriated to this effect ⁽¹⁾. These organs are the muscles, of which there are two kinds; some which are not subject to the controul of the will, and whose motion begun at the first moment of existence, is uninterruptedly continued to its end; such are the heart, the arteries, the stomach, the intestines, &c. There are others whose motion is subject to the will, and which cease to act whenever they are not determined by that principle, either for the wants or pleasures of the individual; such are the muscles destined for the motion of some of the parts of the human body, and employed in conveying us from one place to another.

This division determines two kinds of motion, which are distinguished from each other by very palpable lines of separation. — The one is employed in entertaining the vital principle, the other does no more than supply its exigencies and its pleasures; a difference so remarkable, that it necessarily implies one in the source from whence these motions are derived.

The nerves are the visible canals through which the active fluid we attribute these two kinds of motion to, is conveyed throughout the whole extent of the animal œconomy. Their origin is well known: they are all derived from the organs contained within the cavity of the skull; and amidst the numerous canals which take their rise from the medullary substance of the brain and cerebellum, we may distinguish those which are distributed to those important organs whose action, independent of the will, is absolutely essential to life; these are particularly the intercostal nerve and the eighth pair, which evidently arise from the processus annularis, or Pons Varolii ⁽²⁾, formed, as it seems, by the union of the peduncles of the cerebellum, while no part of the medullary substance of the brain seems to enter into its composition. The nerves, on the contrary, which

which are distributed to organs destined to less important functions; to such, for instance, whose province it is to direct our loco-motive powers, subject to the controul of the will; these, I say, are all derived from the medullary substance of the brain, or from the spinal marrow which is the continuation of it.

From this observation we may be convinced that the fluid separated by the cerebellum is of a superior quality to that furnished by the brain, and that the functions of the first of these organs, are infinitely more important than those which are assigned to the latter. This superiority seems to be indicated by nature in the precautions she has taken to secure the cerebellum from external injuries. The brain, it is true, is likewise protected from them; but the anxiety of nature in her precautions to prevent the injuries the brain might be exposed to, are infinitely less remarkable than those she has employed in sheltering the cerebellum from any hurt that might befall it from without. In fact, the situation of the cavities occupied by the cerebellum, the thickness of the occipital bone, in those parts where external shocks might take place, the quantity of muscles that surround that part of the basis of the skull where the bone is thinnest, the tentorium which covers the cerebellum, and prevents it from suffering compression from the posterior lobes of the brain; the construction of this tentorium, made with a sagacity which cannot be sufficiently admired; the speedy death which is the consequence of wounds inflicted on the cerebellum, while very material wounds of the brain are sometimes not mortal⁽⁴⁾; all these circumstances, I say, contribute to give the strongest degree of evidence to the superiority we have established.

But the brain and the cerebellum are not the only preparers of animal spirits; we find other organs in the cavity of the skull, which leave us no room to doubt, that in her preparation of the nervous fluid, nature hath established a difference relative to the end she means to accomplish. The corpora striata, for instance, placed in the midst of the brain, are they not particular organs which display the whole apparatus for secre-

tion; to wit, a greyish substance, the secretory organ⁽⁵⁾, and a white or medullary substance, the union of which forms the origin of the first pair of nerves, destined to convey that particular fluid fitted to the purposes of smelling?

Do not the second pair of nerves, which become the immediate organ of vision, take their rise from a particular substance, distinguished by the name of *thalami nervorum optidorum*, and which seems to form a kind of smaller, in the midst of the larger brain? The medullary substance, which their external surface presents, is probably impregnated with a fluid already secreted in some other part, and which, in its passage through the greyish substance of these *thalami*, receives a higher degree of elaboration before it reaches the medullary substance, which is in their center, and which is the origin of the optic nerves, continually replete with a particular fluid, calculated solely to receive the impressions of light.

The pineal gland composed of a grayish substance, and which has two medullary threads produced from it, is it not also the strainer of a fluid destined to supply some important functions? The pituitary gland, the use of which we are as little acquainted with as with that of the former, may it not likewise be the elaboratory of some particular fluid absolutely necessary to life? This may, at least, be presumed, when we consider all the precautions nature has taken to secure it from outward injury, and from being compressed by the parts that surround it; for nature does nothing without necessity or without a motive, and wherever we can follow her steps, or discover them by conjecture, we find that her choice is always supported by reasons which compel us to admire and be silent⁽⁶⁾.

The third pair of nerves gives us another proof that nature does not make an indiscriminate use of the two sources we have indicated. It is from the medullary substance of the brain, that this pair draws the fluid it supplies to the muscles that are governed by it, which are the movers of the eye, an organ endowed with automatic motions, produced by the

fluid of the third pair, and with motions of expression which certainly require fluids derived from other sources. It is for this reason we see that the fourth pair, a small nervous filament, goes to receive the fluid it is to convey to the external oblique muscle of the eye, from the posterior and inferior part of the tuberculi quadrigemini ⁽⁶⁾. The same thing may be observed of the branch of the sixth pair which goes to the *abductor*, and whose origin is at the Pons Varolii ⁽⁷⁾.

Had the globe of the eye wanted nothing more than a change of position, the third pair supplies it with filaments of a sufficient size to have produced this effect for as long a continuance, and as frequently as the functions of this organ might require, or otherwise this third pair would have been made more considerable at the expence of the large medullary mass of the brain; but the fluid supplied by this pair could not, probably, in many circumstances, have answered all the designs of nature for want of sufficient activity and energy. Love, anger, joy, sorrow, pride, and contempt, which are so strongly expressed by the eye, that it is with reason considered as the mirror of the soul, are undoubtedly affections which cannot be expressed by the powers of that grosser fluid which is secreted from the great reservoir.

It is true, that the two last branches of the fifth pair of nerves, as well as its ophthalmic branch which contributes to form the intercostal nerve, the remainder of the sixth pair which has not been employed in this foundation, and the seventh pair, derive the fluid they are destined to convey, from the medullary substance of the cerebellum, in common with the intercostal nerve and the eighth pair. But although the functions of the parts on which they are bestowed, do not immediately seem of so great importance as those of the parts to which the intercostal nerve and the eighth pair are distributed, yet it is no less certain that the cessation of their action would very soon be followed by death.

Were the secretion of the salivary fluid, were mastication, or deglutition, interrupted for a certain space of time, in vain would the heart, the
lungs,

lungs, the stomach, the intestines, &c., enjoy the power of fulfilling the offices assigned to them; the animal would soon cease to live. If the smell, the sight, and the hearing, be not absolutely essential to life, they are, at least, sensations which constitute the only pleasures of our existence, and the man, who should be deprived of them, would probably be ranked among the most stupid animals; it is even to be presumed that if the deficiency of the senses were not then filled up by some particular instinct, he would be unable to minister to his own wants, even in the midst of those productions which might be sufficient for the purpose.

From what has been said, we are obliged to allow, that the fluid which makes of man a living and thinking being^(c), which renders him capable of all those improvements that embellish his nature, is derived either from the medullary substance of the cerebellum, or from particular and very distinct organs of the brain itself; and that the loco-motive faculty which completes the animal machine, by adding greatly to the pleasures of its existence, is derived from the fluid furnished by the medullary substance of the brain. This presents to us two kinds of motion, as distant from each other as the springs from whence they are derived. One kind, which essentially constitutes life, over which the will exerts no empire, and which is produced by the fluid separated from the cerebellum; another kind, not of such absolute necessity, subject to the controul of the will, and effected by the fluid separated from the brain.

These preliminary notions concerning the origin and the distinctions of motion being acquired, its effects on the animal œconomy will more easily be perceived, and the indications which direct the use of it, will be more readily suggested. These two points of discussion form a natural division of this essay into two parts. The object of the first will be to demonstrate the effects of motion and rest, and the second will discover the indications which prescribe the use of either in surgical disorders.

THE HISTORY OF THE
CITY OF BOSTON
FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
IN TWO VOLUMES
BY NATHANIEL BENTLEY
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P A R T I.

AN EXPLANATION OF THE EFFECTS OF
MOTION AND REST.

THOUGH the motion of the organs essential to life, may, of itself, maintain the vital principle in man for a considerable time, yet this motion is not bestowed upon an individual destined to live by himself; for, in man, the loco-motive faculty is almost as necessary to his existence, as that kind of motion on which life more particularly depends. This is so true, that a paralytic person left to himself would soon perish, although his organs of circulation, respiration, digestion, and those of the other several secretions, &c., should have preserved the faculty of performing their respective offices. Indeed, what sort of life is it that the unfortunate class of men enjoy who are afflicted with this disease, even when they are provided with all the helps which persons who feel for their situation can supply them with? Some few individuals only excepted, they continue to exist, and that is all. If, therefore, the action of the external muscles, or the exertion of the loco-motive faculty,

be not absolutely necessary to life, they do, at least, contribute in a very evident manner, not only to its support, but also to its energy.

The effects of the exertion of this loco-motive power cannot, therefore, be indifferent in the cure of surgical disorders; they may facilitate or disturb this end as they are properly or improperly applied. The academy certainly expects from those who shall discuss the question proposed, an explanation of the cases and the times when it is necessary to forbid or to advise the exertion of this power. But to proceed with order in so interesting a subject, after having briefly exposed the effects of the motion of those organs whose action constitutes life, it will be proper to explain the share which the motion of those on which life does not immediately depend, has in the preservation, and if we may be allowed to say so, the perfection, of the vital principle.

The heart is moved and exhibits a succession of dilatations and contractions, by means of which the circulation of the blood is carried on. The arteries destined to convey this fluid, present the same phenomena to our view. But these actions diminish as they proceed, so that the contracting power which belongs to the arteries, and which is still so visible in small arterial branches, is, at length, reduced in their last subdivisions, in the lymphatic and serous vessels⁽⁸⁾ that are continued from them, and in the origin of the veins in which they terminate, into a kind of elastic power which constitutes the tone or spring of all our parts. This last is an imperceptible action, sufficing only to keep up the motion of the fluids, to preserve them in a fluid state, and to maintain life, which is the consequence of this fluidity.

The chest dilates and contracts itself alternately by the action of muscles, over which the will has but a very limited power of suspension or acceleration; so that respiration is habitually carried on without the concurrence of the will. The stomach is possessed of a power of contraction proper to the fibres that compose it; the intestines are endowed with a vermicular motion which is particular to them; in these viscera,

as in the liver, the spleen, the pancreas, the kidneys, the organs of generation, the brain, and most of the other glands, there are necessary secretions carried on, which are as much the product of the motion impressed by the heart on the fluids it supplies them with, as of that which they receive from the contracting power of these viscera themselves, which are far from being passive. It is indeed by their combined action that life is continued and maintained; but this is upon the supposition that the stomach is constantly receiving substances, proper to furnish materials, for the repairs required to supply the losses and decays that are the necessary consequence of excretion and motion. Under this supposition, each of the organs essential to life will separate, from the primary fluid, those liquids that are necessary for its support, and for the secretion it must perform, if it be a secretory organ. But in order that the primary fluid may supply materials fit for the repairing of the machine, and for the various secretions that are to be carried on throughout the animal œconomy, it is necessary that the crude materials extracted from the aliments by the juices subservient to digestion, and introduced by the lacteal vessels and the thoracic duct into the general course of the circulation⁽⁹⁾, should undergo some previous elaborations. These are brought about by the agitation of those materials, and by the friction and trituration that are its effects, and which fit them, at length, to associate themselves with other analogous materials, for the repairing of the machine in which they are destined to be employed. But in order that these elaborations may be such as are required, and that they may preserve in the animated machine the principle of life in its full vigour, it is necessary that the motion should be regulated at a certain medium indicated by nature⁽¹⁰⁾. Below this medium, the elaborations produced can only furnish thick, ill-concocted materials for the purpose of repairing the cause of numberless obstructions, which, after they have gradually embarrassed the motions of the machine, at length destroy it. Above this medium, motion gives the reparatory substances a hasty elaboration, that brings them too speedily to that putrid decomposition which is their last period, and which consequently does not allow them to be employed for a sufficient length of time in the support of the machine. From
which

which it follows that an excess of motion is liable to inconveniences directly opposite to those that are the effect of its deficiency; such are the disorders arising from the dissolution of our fluids, and the disunion of the globules that compose them, together with the various diseases and accidents that may spring from this general cause.

Nature, ever attentive to the preservation of that machine, in the construction of which she hath appeared to take so much delight, has provided for it in a manner as wise as it is admirable. Motion being the only way of preserving it, she hath at first given it a primitive, essential kind of motion diffused throughout the whole animal œconomy, over which the will has no power, and which can alone entertain the vital principle in man; but if he were restrained to this motion alone, his life, far from being a blessing to him, would have been a fatal gift. The loco-motive faculty subject to the controul of the will, comes very seasonably to the assistance of this first kind of motion, the effects of which it is to complete, by exalting it to that medium which can only produce the proper elaborations for the support of the animal œconomy⁽¹¹⁾. As the will is capable of putting this loco-motive faculty into action, it might also render it useless; but nature has provided against this, by submitting the animated machine to the imperious voice of want, in giving it passions and sensations. By these it is solicited, it is compelled to move, to direct itself towards the objects it feels itself inclined to, to search for them, and to labour in order to procure to itself the enjoyment of them. Thus it is by the sense of want that nature has chosen to furnish the machine she meant to preserve, with a supply of motion, absolutely necessary to maintain it in its entire state, during as long a continuance as it was designed for at its first construction.

The law of labour imposed upon us by the Author of nature, was therefore connected with the plan of our preservation; and that we might not infringe this law, he has made labour absolutely necessary for us. Unhappy are they who attempt to elude it! The numberless diseases they are afflicted with, and which are the characteristic of a life
reduced

reduced within narrower bounds^(c), expose them to a very severe penalty for the infringement of this sacred law.

But this secondary motion, subject to the controul of the will, and which comes so seasonably to the assistance of the first in perfecting the functions of the animal œconomy, may deprave them when it is carried to excess; it might even destroy them very speedily, had it no other restraint besides that of the will. For the imperious will, solicted by passions it is eager to gratify, and ever intent upon its object, would soon carry to excess the motion which is subordinate to it, and would imperceptibly strike the fatal blow to that machine for the preservation of which it was instituted.

But here again nature, as in every other instance, has been watchful to prevent the abuse; for, after motions too violent, or too long continued, she hath made the powers that execute them, disobedient to the call of the will. A kind of palsy, the effect of the animal spirits being exhausted, follows the too forcible exertion of the muscles, and makes rest necessary. Rest may be compleat or incompleat; compleat, when the loco-motive faculty seems to be in a perfect state of annihilation, and that the organs of the senses require to be excited by a stimulus more powerful than usual, from the substances which ought to affect them; this it is that constitutes sleep: incompleat, when the organs of the senses, restored, at the time of waking, to their natural sensibility, the loco-motive faculty, without being exerted, may be put into action by the slightest impulse of the will. This incompleat kind of rest is divided into general and partial; general, when this faculty is not exerted on any of the parts of the machine; partial, when it is put into action, to move only some of its parts.

Rest, as we see, is susceptible of many degrees, and hath advantages as real and as efficacious as those that result from motion. Rest is, indeed, the regulator of motion, and is intended to keep it in that state of equilibrium which constitutes health; or rather it is the loco-motive faculty,

culty, which being sometimes exerted, and sometimes suspended, becomes the essential regulator. What motion has destroyed or corrupted, is repaired by rest, and the disorders which may be occasioned by a too long continuance of rest are relieved by motion. It is during the intervals of inaction, or of sleep, which necessarily succeeds to labour, that the vital fluid, exhausted or corrupted by the effects of motion, is repaired and restored after all its losses; and that the liquids, too much agitated and attenuated by muscular action long continued, resume their former degree of consistence. From motion carried beyond the degree required, there must follow a dissolution, or a premature decomposition of the humours necessary for the support of the animal œconomy; and from excess of rest they must become too much thickened. Some reflections and facts will give the highest degree of evidence to these two assertions.

While motion, by the combination of its two kinds above mentioned, is kept in its due medium, the repairing materials conveyed every day into the general course of the circulation, are not more agitated and attenuated than they should be to unite themselves with others similar to them, and to be conveyed with these to the parts where they are to be employed. They do not mix or contract adhesions with materials of a different kind, except as far as is necessary to accomplish any views nature may have in bringing about such combinations. Each of these materials, which hath not contracted any improper connection, is readily and easily admitted into the strainers destined to receive it; all the secretions are properly carried on, and harmony reigns throughout the machine.

It is in this state of health, or of moderate motion which constitutes it, that some part of the fat and oily substances conveyed by the primary fluid, is continually deposited in particular divisions of the cellular substance, to form and keep up what we call a natural plumpness (9). It should seem indeed, when motion is carried beyond this medium, that the repairing materials, undergoing a more powerful trituration, ought sooner to acquire that degree of elaboration which makes them fit to be

employed in repairing the machine ; but, on the contrary, excessive motion destroys this useful end, by forming between these materials that are of a different nature, cohesions and connections which prevent them from being deposited in a sufficient proportion for the support of the machine ; and such of them as may be deposited in a sufficient proportion, will too soon have attained that period which requires their being replaced.

In this state of excessive motion, which discovers, at least, a kind of dissolution in our juices, the oily part of the blood is either deposited in a very small quantity in the adipose cells, or is perpetually re-absorbed into the general course of the circulation, either to avoid the pernicious effects of too great a friction, or, in mixing, by the means of trituration, with certain depraved humours and materials, to facilitate their expulsion ; and that by reason of its oily smooth particles, which prevent the corrugation and contraction of the strainers through which these corrupted juices must pass. Thus we see that leanness is usually the attendant of excessive labour ; the continuance of it would necessarily bring on a complete dissolution of our juices ; but nature has put insurmountable obstacles to this fatal effect ; to wit, lassitude, and sleep which succeeds to it. During the latter, which is an image of the most perfect state of rest, the mass of humours, being only affected by that motion which is produced by the action of organs not subject to the will, the particles of similar materials, diffused throughout this mass and which have experienced a kind of separation, are endeavouring to reunite themselves, and to contract a new degree of coherence that may enable them to sustain the efforts of that motion which must increase at the time of waking. Fresh food, by furnishing recruits of crude and glutinous materials, contributes to strengthen this salutary cohesion, and to weaken the pernicious effects of motion too long continued.

It is so true that rest increases the consistence of our juices, that when it is excessive, by carrying this consistence too far, it produces evident marks of inspissation in some of our humours. It is chiefly among men

who live in a state of inaction and indolence, that we find that exorbitant fatness which bespeaks an habitual deposit of glutinous and oily juices in the divisions of the cellular substance. In such persons it is not necessary that this juice, in many respects so pernicious, should be taken up into the general mass to avoid the pernicious effects of friction, which they are far from carrying to excess by muscular action. It is among sedentary and idle persons that we usually observe those inspissations of the lymph, which occasion obstructions so difficult to conquer; and those nervous disorders so common in the present age, and which are evidently produced by the thickening of some of the juices of the animal œconomy. This may the more reasonably be presumed, as these affections are mitigated by the continued use of diluters, of warm bathing, which supplies a greater quantity of fluid to these inspissated juices, and of cold bathing, which, while it assists in this first intention, encourages, at the same time, their separation, by strengthening the tone of the solids that are to act upon them. We may add that these diseases are cured by a vigorous and continued exertion of muscular action, which, after it has restored these inspissated juices to their natural fluidity, is alone capable of maintaining them in it.

From what has been said, it follows, that motion has the property of attenuating our fluids, and of keeping them in a state of fluidity proportioned to the active cause. This fluidity may be either too great from the too violent and too long continued exertion of the agent that produces it; and, in this case, it is called dissolution, and the machine is exposed to those disorders which arise from this kind of cause; or else this fluidity may be less than the necessary degree, which may proceed from the weakness or inaction of the agent that should keep it up. In this instance, the want of fluidity takes the name of inspissation, and the disorders manifested in the animal œconomy, are such as are produced from this kind of cause.

P A R T II.

EXPLANATION OF THE INDICATIONS WHICH ARE TO LEAD
US IN PRESCRIBING THE USE OF MOTION AND REST IN
SURGICAL DISORDERS.

FROM the short account we have been giving of the necessity of motion, and of its effects, it will not be difficult to discover the indications which are to lead us in prescribing or forbidding the use of it in surgical disorders. If it be required to resist or prevent the inspissation of the fluids in the cure of these disorders, it will be necessary to call in the assistance of motion, provided there be no particular circumstance that may render the use of it improper. If, on the contrary, the plan of cure require to give a better consistence to the fluids, and if the effects of motion should counteract this plan, we must have recourse to rest. We shall be in no danger of making an improper application of these two curative methods, if we can settle our ideas upon the advantages that attend them, by facts and instances supported with proper reflections; and in order to throw this part of our essay into some method, we will divide it into two sections. In the first we shall expose the indications which are to determine the use of motion; and in the last, those in which rest is to be prescribed.

S E C.

S E C T I O N I.

EXPLANATION OF THE INDICATIONS WHICH ARE TO LEAD US IN PRESCRIBING MOTION FOR THE CURE OF SURGICAL DISEASES.

AMONG the several surgical diseases in which experience has established the necessity of motion, we find, that they are all produced by the inspissation of some of our fluids. The gout, the rheumatism, anchyloses beginning or formed, stiffnesses of the joint, all proceed from this cause. The gout indeed, that cruel and common disorder, which scarce ever visits the cottage of the poor man, but whose ordinary residence is in the midst of luxury and opulence, discovers, in all instances, an evident inspissation of the lymph. The kind of serum which circulates, being no longer able to preserve, in a state of dissolution, all the earthy particles it conveys through the lymphatic vessels of the ligaments and aponeuroses that surround the extremities, as the feet and the wrists, deposits there some of these materials. These, losing that globular form which they had in common with the fluid that served as their menstruum, become irritating bodies, the action of which, upon aponeurotic parts of extreme sensibility, occasions those acute pains that characterize

characterize this disease. Nature, it is true, generally succeeds in dissipating its paroxysms by a process of greater or less continuance; but this process is nothing more than an increase of motion, which manifests itself, first, in the part affected, by the swelling, pain, and inflammation we observe in it; then in the whole habit, by the fullness of the pulse, and the evident fever that often accompanies this disease. It is by means of a similar increase of motion, that nature, at length, prevails, in comminuting and attenuating the earthy materials that are deposited, so as to render them fit to be remixed with the fluids accumulated in great abundance about the seat of the pain, and thus to facilitate their expulsion through all the natural channels of excretion. Nothing can be more easily proved than that these disorders proceed from want of motion, nothing is more evident than that they are relieved by an increase of it; and I shall now proceed to shew that increase of motion will also prevent them.

The rich, over whom the gout more particularly exerts its dominion, living in the midst of idleness and luxury, seem to be affected with a demi-palsy; though they are in possession of the loco-motive faculty, they do not put this power into action; the law of labour seems not to have been imposed upon them, at least it is become a habit with them to elude it. These beings are therefore almost reduced to that radical kind of motion which is independent of the will; the other kind which is subject to its influence, and which ought to compleat the effects of the former, so as to give the repairing substances the necessary degree of elaboration to maintain health, is never sufficiently exerted by them to obtain this effect. The imperious call of want, which urges this second kind of motion, is never heard by them, and deprived of this salutary incitement, they live in a state of indolence, the sweets of which are deservedly embittered by their effects.

With these Sybarites, accustomed to high living, motion is, in general, not sufficiently exerted, to give to the quantity of crude materials constantly admitted into the course of the circulation, a degree of elaboration

tion perfect enough to form none but proper nutritive juices, and to expel the remains of those that have been spoiled by time and friction; from which, it necessarily follows, that there must be some depraved humours remaining. These being deposited upon certain parts, produce in them diseases more or less acute, and more or less dangerous, in proportion to the difference of the texture and sensibility of those parts. These deposits usually taking place in the feet, the wrists, and the knees, form the gout, which, as we see, is the evident consequence of motion not being sufficiently exerted to keep up that fluidity of the humours which constitutes health. If old people be more tormented with the gout, it is because gluttony and indolence usually increase in an advanced age, and that at a time when the suppleness of the parts and the diameter of the lymphatic vessels are diminished, circumstances which contribute to encourage those deposits of cretaceous matter that are the evident cause of this disease.

Young men, though rich and voluptuous, are exempt from the gout. For, besides the natural suppleness of the fibres in early life, the faculty of motion is excited in them by such a variety of passions, that it supplies that action which want renders necessary in less fortunate persons. The game of tennis, dancing, hunting, fencing, and riding, are exercises which prevent the bad effects of the want of motion among persons of this description; but, at the age of thirty, these wholesome exercises no longer make a part of their plan of amusement. On the contrary, their present games scarce require that they should speak or move their fingers; and accordingly the gout was never so general as at present, even at a time of life when it was formerly unknown. It is evident from what has been said, that want of motion is the principal cause of this disease; the work of nature, in relieving its paroxysms, allows us no room to doubt that the salutary crisis which dissipates them is owing to an increase of motion. This must therefore certainly be the best method of resisting or preventing the gout, and the indications which direct the employment of it in the cure of this disease, are too precise to be mistaken. Besides, experience has so frequently established

the efficacy of this method, that it would be almost useless to bring facts in support of the truth of this assertion; yet as these carry with them complete conviction, and as they are the touchstones of just or false reasoning, I shall produce some instances, in which this mode of relief has been employed with a success so pointed, that it is impossible we should not distinguish the views of nature in the use of it⁽¹⁰⁾.

A man who had led a very active life till he was thirty years of age, was, at that period, engaged in a sedentary employment. A few years after he felt some slight attacks of the gout which seized him every six months. These became afterwards so sharp and so lasting, that at fifty years of age he was cruelly tormented with it. The fits lasted five or six weeks, and returned three or four times in the year; neither had the remedies he had tried at different times procured him any sensible relief. The feet, the wrists, and the knees were the ordinary seats of the disease, which, at fifty five years of age, notwithstanding he led a very sober life, had reduced him to a very miserable state. Being strongly persuaded that the painful life he had experienced for twenty years past, was owing to the little exercise his employment admitted of, he purchased at that time a garden out of town, fully determined to be his own gardener. As he delighted in flowers, he employed himself in the cultivation of them, and laid a plan of hard work for himself during several hours every day. He kept his resolution, so that for a number of years there were few days in which he was not obliged to change his linen several times in the day, in consequence of the profuse sweats he was thrown into by his strong and continued exercise.

The first year he felt a change which encouraged him to proceed; and at the second year, sound and quiet sleep, a constant appetite, and an uncommon agility, the inseparable attendants on health, succeeded to all those infirmities he had before experienced. He arrived to the age of fourscore without bearing any marks of decrepitude, and still continued to work in his garden, even in winter time. But a fore leg, in consequence of a burn, having confined him for a long time to his room in
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the year 1776, he has since been attacked with a terrible jaundice, which has terminated in a herpes that may probably be still dissipated by motion and the labour he is beginning to resume.

A young man, very fond of tennis, and who frequently indulged in this exercise, having quitted it almost entirely for several years, to follow a profession which was rather inconsistent with this kind of dissipation, was seized at the age of thirty with pretty smart fits of the gout, and which returned at very short intervals. These fits became more and more continued and painful, notwithstanding he observed the most regular conduct and the strictest regimen. I advised him to play again at tennis, to the leaving off of which I attributed the appearance of this disease at an age when one is usually exempt from it. He contrived his business so as to be able, three or four times a week, to allot two or three hours to this exercise. This succeeded at first in lengthening the intervals of the fits, and diminishing their violence, and at last made them totally disappear; for during some years past he has not felt any return of them. It would be needless to alledge any other facts to prove the necessity of motion in the cure of the gout; the instances which establish the advantage of this method are too numerous and too well known to leave us any room to doubt of the propriety of employing it in this case⁽¹¹⁾.

The rheumatism differs from the gout merely in the seat of the obstruction, which takes place in the aponeuroses of the muscles in their sheaths, and in the strainers of those membranes that surround and connect them. This obstruction being, as in the gout, the effect of an evident inspissation of the lymph that is conveyed through the channels of these parts, motion must necessarily be also the proper agent in this case. It must therefore be employed to restore these inspissated humours to the degree of fluidity required for their free circulation. Accordingly we see, that if the persons who are attacked with the rheumatism, have resolution enough to bear the very sharp pains always occasioned upon first moving the part affected, they soon contrive to get rid of them en-

tirely by very powerful and long-continued exercise, which putting the part affected in action, produces in it a salutary agitation and attenuation of the humours forming the painful obstruction⁽¹²⁾. Even in those cases where the pains are too violent, and muscular action too much benumbed to admit of vigorous motion in the part affected, the best curative means are still to be chosen from among those that stimulate the solids and fluids of the part. These are, either warm or cold bathing, which, besides facilitating the attenuation of the humours by the introduction of aqueous particles that may possibly be conveyed so as to mix with them, do also excite motion in them; cold baths, by increasing the tone of the solids; warm ones, by the rarefaction they produce in the fluids. Stupes add to these effects, already so efficacious in themselves, the power of breaking mechanically the inspissated juices by the shocks and strokes they carry along with them. The juices are, as it were, kneaded by this agent, which from its soft, mild, and uniform method of acting, is much to be preferred to the other external methods employed to produce this effect; such, for instance, as dry frictions upon the part, flagellation with nettles, &c. — If these kinds of means are sometimes attended with success, it is evident this must happen by their conveying into the painful part a degree of motion fit to attenuate the humours that formed the obstruction, and induce them to a change of place. This reasoning may be extended to those large blisters successfully applied to limbs affected with the rheumatism; it is as much by the motion they excite in the part, as by the discharge of serum, and the suppuration they occasion, that they produce those salutary effects they are often attended with.

An anchylosis appears to be nothing more than a gradual inspissation of the synovia, by which, bones originally designed to move freely upon one another, become consolidated. The curative indication that presents itself here is to counteract this inspissation while it is forming, and to restore the synovia to its first state of fluidity, when it hath acquired a preternatural consistence which confines and even destroys the motions it was destined to facilitate: but what are the means by which this indication

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cation is to be fulfilled? Which is the kind of remedy that experience hath determined to be the most successful in these cases? It is the motion of the parts composing the joint, which by acting upon the thickened synovia, by rubbing and triturating it, restores to it that fluidity it had lost. The indications for the use of this method are indeed so pointed in this sort of anchylosis, that it cannot be supplied by any other; but there are other kinds of this disease in which there are evidently counter-indications that oppose themselves to the application of it; and in others again, there is as much precaution as skill necessary to direct the employment of it. A hasty review of the chief causes of this disease will be sufficient to direct the proper application of motion in its cure.

The anchylosis may be the effect of too long-continued rest, of too great inaction of the bones destined usually to move on one another, and then it will be sufficient to restore by degrees these bones to their ordinary motion, either by the action alone of the muscles that are inserted into them, supported with a degree of firmness necessary to overcome the painful sensation of the first motions, or by increasing that action by external powers. It seldom happens, however, that inaction alone, even though continued for a considerable length of time, can produce this disease. Its most usual causes are, the diseased state of the bones, either on their articular surfaces, or in the neighbourhood of the articulations, the inflammation and tension of the ligaments that strengthen them, and of the muscular aponeuroses that cover them. It may be observed indeed, that in the diseased state of the articular surfaces of the bones, the anchyloses may frequently be considered as the resource of nature for the preservation of a limb she is not willing to lose; and in these cases we ought to be so far from resisting the progress of this disease, that our art must be exerted in encouraging it by every possible means⁽¹³⁾. It may here well be presumed that motion is not to be employed to bring about this salutary end, as I shall shew hereafter, when I shall expose the indications which direct the use of rest in surgical complaints. But setting aside these circumstances in which an anchylosis may be considered as an advantage, motion must be the curative medium most to be depended upon

upon in these cases, if we employ it with all the precautions required by the difference of circumstances. We may even have recourse to it with confidence in those cases which seem more particularly to forbid the use of it.

Fractions of the joints, for instance, by occasioning an extravasation of bony matter into their cavity, seem at first sight to make an anchylosis unavoidable, and yet, in these cases, motion employed with skill may frequently prevent it. To be convinced of this from theory, we have only to trace the mechanism by which this extravasation is made in most circumstances. If the bones, fractured at their extremities in the joints, have not experienced any evident change of position, or if they have been replaced in their original situation by the Surgeon's art, the bony matter exuding from the surfaces of the solution of continuity, tends, as in other instances, to consolidate the divided parts, in order to restore them to their functions. It is true, indeed, that the bony matter, being extravasated, exceeds the level of the parts brought into contact, and that as it thickens, it forms a solid mass on the divided part, and that this mass, on the side of the cavity of the joint, must be so much the more considerable, as the bony matter must have met with less opposition in its growth; but it by no means follows that an anchylosis must be the necessary consequence of this. Motion may be employed with advantage to prevent this accident, and the bony projection which threatens the joint with it, indicates, by its very formation, the employment of this method, which can never act more effectually than while the callus is still soft. For this reason, when we may presume that the fractured pieces have begun to acquire a certain degree of coherence among themselves, by means of the bony matter that must consolidate them, it will be necessary to give gentle motions to the joint, and to repeat them as often as circumstances will permit. It is evident that the projection of the callus, which is still yielding, will be restrained, and that at length the play of the articulation will be perfectly restored. Supposing however that the projection had acquired a considerable degree of consistence, we must not, on that account, abandon the joint to the anchylosis that may threaten

threaten it. This circumstance can only render the use of motion more painful and more difficult; but by persevering in the use of it, and by combining it with that of diluting and relaxing applications, calculated to diminish the force of the pressure of the articular surfaces one against another, we shall at length succeed, if not in levelling entirely the bony projection, at least in rendering it so smooth and polished that the motion of the joint shall no longer be impeded by it.

What is thus dictated to us by reason, I have observed more than once confirmed in fractures of the olecranon, which is evidently adapted to the articulation of the arm with the fore-arm. If an anchylosis be frequently the consequence of this accident, this is less to be ascribed to the nature of the fracture, than to the want of skill in those who treat it. It is true, that if, in this case, we put the fore-arm in a bent situation, and in a sling, the olecranon being then fixed by the extensor muscles that are inserted into it, while the rest of the cubitus forms a right angle with the humerus, there will necessarily remain a considerable interval between the two fractured pieces. In these cases, the exudation from the fractured surfaces being discharged into the cavity of the articulation, and afterwards consolidated there, would, from this reason alone, destroy the power of its motion; but even if this exudation, without stretching into the cavity of the joint, should only fill up the space between the cubitus and its apophysis, and that simply by moulding itself on the correspondent part of the humerus, the anchylosis would no less be the necessary consequence of an addition that should have lengthened the natural unciform process formed by the olecranon; for the extremity of this process, resting then upon the bottom of the cavity that is found in the posterior part of the humerus, we never can hope to make any extension of the fore-arm, and it must therefore necessarily remain in the state of flexion in which it hath been placed (*f*); but if, instead of using this manœuvre, so opposite to all the rules of art and of common sense, we keep as much as possible the fractured parts in a state of approximation, by a constant and moderate extension of the fore-arm (*g*), and by a suitable bandage, then the exudation which proceeds from

the corresponding bony surfaces, as it condenses, does nothing more than unite the olecranon to the body of the ulna from whence it was separated, and that without any visible increase of length. In this case, the callus would only form a trifling projection on the side of the articulation, which might, however, confine the motion of the joint, if it were not kept under. But if we give the joint a little motion towards the twenty-fifth day⁽⁴⁾ after the accident, before the callus be completely hardened, and if we increase this motion by degrees, this projection will give way, and in a few months the joint will recover all its motions, as I have been convinced by some cases of this kind in which I have followed the practice here laid down.

It may, however, be observed, that after the olecranon has been united by the skilful methods required in fractures of that bone, any difficulty of motion that may exist, may proceed either from the mass of the callus on the side of the articulation, or from the projection of one of the pieces of the bone itself, by reason of the difficulty, not to say the impossibility, of keeping them on a level. But whether it be that these causes act separately, or in combination, to restrain the motion of the joint, we may readily conclude from what has been said, that motion is the only power that can be employed with advantage, in removing these inconveniences, and in restoring the joint to its original freedom. This is effected, at length, by polishing and wearing down, either the hardened callus itself, or the bony particles projecting in the cavity of the joint. The only circumstance to be attended to is, that in the last case, as the first motions must necessarily be more painful and difficult, it will be proper to be more careful in the employment of them, than in the other instance.

If motion be almost a certain remedy against an ankylosis threatening the joint in most of the fractures incident to it, we are not to expect less effect from this remedy, when a rigidity is likely to ensue from a compound fracture, with splintering of the bone, in the neighbourhood of an articulation. As the stiffness of the joint, in this case, can only proceed

ceed from an inspissation of the synovia, and from a rigidity, the ligaments and aponeuroses surrounding the joint may acquire, motion may be considered here too as the means to prevent an ankylosis. But if we consider that the state of the parts which leads us to apprehend this inconvenience, is the consequence of their tension, inflammation, and disposition to suppuration, as also of the long inactivity they must be kept in, in order to accomplish the first indication which is the cure of the fracture, we shall conclude that the ankylosis, in this case, is but a secondary accident which must not be attended to, at least, for some time. Motion is undoubtedly the proper remedy in this case too; but previous to our having recourse to it, it is necessary that the consolidation of the bony parts should be considerably advanced; and that the inflammation and irritation of the ligaments and aponeuroses should so far be overcome, that motion may not produce in them a painful extension which might tend to excite the inflammation afresh, and to form abscesses in the part. As soon as these chief indications are obtained, we must call in the assistance of motion to prevent the ankylosis with which the joint is menaced. If the articulation be still susceptible of an evident degree of mobility, its own motion alone excited and increased by degrees, will, in time, restore to the ligaments and aponeuroses their flexibility; and to the synovia its ordinary fluidity. But if the synovia have acquired too much consistence, and that the inspissation of the fluids which fill the canals of the ligaments and aponeuroses, should have made them too rigid to admit of being put in motion without causing very great pain, we must then avoid persisting too obstinately in the use of this method. I have seen considerable swellings and ecchymoses brought on after an inconsiderate use and exertion of motion under such circumstances; these have made it necessary to postpone for a long time the use of this efficacious method, which had failed only from the neglect of precautions proper to have insured its success. In these cases the motion of the joint must be prepared and preceded by oily and saponaceous embrocations⁽¹⁵⁾, by warm and emollient baths, and especially by stupes. These remedies, by transmitting a gentle motion among the inspissated juices, and even by beginning their liquefaction through means of the penetrating particles

they may convey to them, are capable of supplying the ligaments and aponeuroses, and are therefore excellent means to be employed previous to that motion which is to restore to the joint its free play, and get the better of the anchylosis.

Stiffnesses of the joint which continue for a long time after sprains, luxations, and fractures, even at a distance from the articulations, are also produced by an inspissation which is the effect either of the compelled stagnation of the fluids during the obstruction of the parts affected, or of the continued rest to which they have been confined in order to fulfil the most urgent indications which these disorders present. In these cases too, motion either alone, or combined with other auxiliary methods I have before mentioned, is the effectual remedy to remove these rigidities⁽¹⁶⁾. In a word, whatever may be the distant cause from which these accidents may be produced, their apparent cause consists always in inspissated juices, which cannot be restored to their first state of fluidity without the assistance of motion; either internal motion excited by remedies adapted to the cause of the inspissation, or external motion produced by muscular action.

From the facts already recited, which are well known to all the profession, we are sufficiently authorized to conclude, that wherever there is any diseased inspissation, we must have recourse to motion to correct it; but other facts will give the highest degree of evidence to this assertion. Every thing persuades us that the scrophula, for instance, one of those diseases in which this inspissation is most remarkable, is produced by want of motion in the persons who are affected with it.

Infancy, which is usually the season of this disease, is indeed the time when motion is most exerted in the machine; but it is not without necessity that this principle is carried so high at this period. The nature of the food of a new-born infant, the rapid growth he is to experience, the extent of surface he presents, in proportion to his size, to the fluid in which he lives; all these circumstances require in him a

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much greater degree of motion than at any other age. The only nourishment nature has provided for him, must be of an acescent quality, so that to keep the fibres in a state of suppleness favourable to their extension, a considerable degree of motion was required in this living machine, in order to animalize, as it were, this kind of food, and to extract from it the materials proper for the growth of the body. This same motion was not less necessary to supply a degree of heat that should enable the child effectually to support the freshness of the air with which he is surrounded. For these reasons, the contractions of the heart and arteries in earliest infancy are extremely frequent, and muscular motion very quick. At this period then, as at every other time of life, there exists no greater degree of motion than is requisite for the wants of the animal œconomy; and therefore this principle cannot be interrupted or exerted above its powers without producing an alteration in its effects.

While the child draws from his mother's breast the food nature has allotted to him, while he freely enjoys the faculty of moving as much as his muscular powers will allow, his fluids are neither altered by inspissation nor dissolution, and he remains in health. But if for this wholesome food we substitute one that is made with unfermented flour, and if this aliment, pernicious in itself, be also given to excess, the child will not then enjoy a degree of motion sufficient to give the nutritive juices, extracted from such glutinous food, the elaborations necessary to maintain health. Hence will at length result a fault of inspissation, the progress of which will be more rapid, as external or muscular motion shall have been more confined by swaddling cloaths, and therefore less able to second the effects of that motion which is primary and essential to life.

Under these circumstances nature seems indeed herself to have recourse to motion in order to restore the humours to their proper fluidity. Restlessness, agitations, pain, and fever, which bespeak an increase of motion, are so many means she often employs with success in children to resist the acescent property of their fluids, and the inspissation produced by it. But these means are far from being always effectual; there

are children who perish speedily after such exertions; others, after having languished a long time under obstructions of the mesaraic glands, die at last of the suppurations that are formed in them: others again, are seized with obstructions in the glands of the neck, or other external signs which indicate a scrophulous habit. This disease, as terrible from the difficulty of cure as from the accidents that attend it, seems, from the symptoms that manifest it, to be produced by too great a degree of acescency in the humours, which not being sufficiently agitated to correct this disposition, an inspissation of the lymph is produced, which forms the characteristic of the scrophula. Nature seems of herself to point out the remedy, by manifesting an increase of motion in all the efforts she makes to counteract this disease. It is therefore by consulting this wise directress, who never deceives us when we understand what she intends, that we may presume, that motion is one of the means, the efficacy of which is most to be depended upon in the cure of scrophulous complaints. Facts, far from invalidating our ideas upon this head, seem to add a fresh degree of probability to them. Do we not indeed observe, that all dissolvents of the lymph (such as *Rotron's*) composed of alkaline, absorbent, and gently irritating substances⁽¹⁷⁾; that repeated purgatives, that mineral and saponaceous waters, &c., which succeed best in the treatment of this disease; in a word, that all these remedies act no otherwise than by increasing the motion in the machine to a higher degree than before their use? Some of them too, it is evident, tend to subdue the acedent quality of the liquids, which is one of the principal causes of the inspissation of the lymph, as much by the motion they excite, as by the alkaline and absorbent particles they contain⁽¹⁸⁾.

The topics also applied with success upon scrophulous tumours, and distinguished by the name of dissolvents, such as the *Emplastrum de Vigo*, *Diabolanum*, &c.⁽¹⁹⁾, seem to act no otherwise than by increasing the power of motion in the obstructed part. Nature herself, when she cannot by her own powers, or with the assistance of art, dissipate these tumours in an insensible manner, doth she not effect the dissolution of them by calling in the aid of inflammation, and suppuration⁽²⁰⁾, which is the conse-

quence of it? These two agents which she employs to complete her purposes, are they any thing more than the produce of an increase of motion? But the circumstance which evidently demonstrates the efficacy of that principle in the cure of this disease, is, that the remedies adapted to it are never more successful, than when they are combined with strong and continued exertions of muscular motion. This is so true, that with the use alone of some common dissolvent, and a few purgatives administered now and then, joined to that of vigorous exercise taken in the country and in the open air, I have succeeded in curing several young persons affected with scrophulous tumours in the neck, feet, or fingers, some of which, in the latter instances, were attended with fistulous ulcers and caries of the bones. But these means must be continued for a sufficient length of time, to enable the lymph to be restored to its natural state of fluidity, and to be maintained in it; and during the employment of them, we must forbid the use of milk, and all kinds of acid food.

The venereal virus also, which, from every circumstance, seems to be a coagulator of the lymph, and which bears some analogy to the scrophula, since it frequently degenerates into this, appears to require no other remedy than a certain degree of motion excited and kept up for a sufficient length of time to destroy and annihilate the effects of this poison. Mercury used in frictions, the aquila alba, the panacea, the sublimate, and all the other preparations of this mineral internally taken, the sudorific woods, &c., do not exhibit in their effects any thing else but an increased degree of motion throughout the machine. Nor can the volatile alkalis, proposed by Mr. PERILHE⁽²¹⁾, be used upon any other principle in the cure of this complaint. Nature seems not to proceed any otherwise in her efforts to destroy the virus, and to prevent its being communicated to the general mass, when it hath originally been confined to some part. Inflammation, and pain that attends it, and suppuration, which is the effect, are the means she opposes to the propagation of this terrible disease.

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I have seen gonorrhœas cease of themselves, and venereal buboes, abandoned totally to nature, perfectly healed after a plentiful suppuration, and the persons affected with these complaints have not afterwards experienced the least venereal symptom, though they had not made use of any mercurial remedy. I have seen a man radically cured of the most dangerous venereal symptoms, for which he was intending to undergo a salivation, at the end of a putrid fever that lasted forty days, and the crisis of which was obtained by very copious and long-continued sweats.

Mercury and its preparations are not then the only antidote to the venereal virus; every thing that can exalt the motion of the machine to a certain pitch, and maintain it there for a sufficient time, may be used with effect in this case to resist the inspissation of the lymph, and the cause which produces it. Muscular motion, as it cannot be continual, is scarce able to have this effect; but though it may not, of itself, have power to destroy the virus, it is no less certain that it may assist in preventing the progress of it. It is from observing its good effects in venereal affections, that I scruple not to combine it with the use of mercurial medicines, which increase internal motion. I therefore always desire my patients to use a great deal of exercise, while I treat them with mercurial frictions. Though the weather may be rather cold, I do not confine them to their rooms, and have never had any reason to repent of this method. There have been some patients even, who though they went out every day, and took a long walk, morning and evening, have never had the mouth heated, notwithstanding they had used as much as eight ounces of ointment in the usual quantities.

The scurvy not being entirely a surgical disorder, ought not, perhaps, to be noticed here; yet let me be permitted to expose some of the phenomena this disease presents us with in its various stages; because they will form, in regard to what has been said concerning motion and its effects, an additional degree of probability by which it would be difficult not to be convinced. In the first and second periods of this disease, every thing indicates too great an inspissation in the fluids of the persons who
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are attacked with it. Lassitudes, languor, swelling and hardness of the lower extremities, are all symptoms that characterize such a state of the fluids; and cold and damp weather, inactivity, and the use of gross glutinous food, which are the distant causes of this disease, can scarce produce any other kind of vice in the habit. Accordingly in such a situation, what are the curative intentions, and by what means are they to be fulfilled? They consist evidently in exciting the tone of the solids, attenuating the fluids, and restoring them to their usual fluidity. Internal motion, increased by certain remedies that have the power of exciting it, and the exertion of external motion, seem to be the proper means of obtaining these ends.

Now, if we consult facts, we shall find that daily and moderate exercise, exerted so as to bring on a gentle perspiration, that the juice of plants which contain a volatile alkali already formed, that the Peruvian and Winter's bark, that wine and antiscorbutic syrups composed of these plants and of alkaline salts, that blisters, in a word, are all remedies of remarkable efficacy in the first and second stages of the scurvy. It hath even been observed that all the symptoms that denote this disease, have not unfrequently disappeared after a fever continued for a few days. It is evident then that motion is the means employed by nature and by art in opposing this disease; but to that state of inspissation which is the character of the first and second degree of the scurvy, there frequently succeeds a state of evident dissolution in all the fluids. In this case the curative intention and the means of accomplishing it must be adapted to the change the disease hath undergone. Hot antiscorbutic medicines, and blisters, so efficacious in the first and second stages of the scurvy, become prejudicial in this more advanced stage, in which dissolution hath succeeded to inspissation; and a fever is then the most dangerous accident that can happen to the patient; for a dissolution carried to its utmost height, and death which follows it, are the speedy consequences of such an event.

The remedies that succeed best, at this period, are derived from the class of substances which contain a mucilaginous principle, susceptible of a slightly acedent fermentation, calculated to give some degree of consistence to the liquids, and to restore the solids by degrees to their proper tone. Oranges, lemons, fresh vegetables slightly acidulated, new bread, ripe fruits, grapes, warm wine, honey, &c., are the remedies which seem more particularly to possess this property. Motion, so salutary in the first stages of the scurvy, becomes now very dangerous; for it hath been observed in the third, and more especially in the fourth, stage of this disease, that several patients have died of internal hæmorrhages, after having inconsiderately used exercise which, though moderate in itself, was still above their strength; after having made some sudden motion, or after having been only stirred with quickness, and moved incautiously from one place to another.

But this state of extreme dissolution that the scurvy offers at this period, is seldom found among persons who live upon land, except in prisons and dungeons, where inaction, cold, dampness, bad food, and affliction, often contribute to carry this disease to its highest period; for among the common people, even among those who live most poorly, the scurvy seldom shews us any thing more than a vice of inspissation, against which external motion, combined with warm antiscorbutics, may be employed with success. Accordingly in those obstructions of the legs, which have a purple cast, with hardness, and which are deemed scorbutic, so far from its being necessary to prescribe rest, as in other obstructions of these extremities; exercise, on the contrary, and walking in dry and warm weather, combined with the remedies suitable to the scurvy, have always appeared to me the most proper means of relief; and I have often observed that these obstructions were less considerable, and less shining towards the evening, after a good deal of walking, than two or three hours after the patients had got out of bed.

From what has been said, it appears, that the indications which lead us in the application of motion to the cure of surgical disorders are evident.

dent. If we must attenuate and divide the fluids, if their too great inspissation should produce a real disease, or form an obstacle to the cure of any one ; motion becomes one of the most certain curative methods, the efficacy of which is established by experience.

NOTION AND REASON

It we must acknowledge and divide the whole, at least the great in-
formation should produce a real whole, or form an object to the eye of
any one person because one of the most certain relative methods, the
theory of which is established by experiment.

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S E C T I O N II.

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LEAD US IN PRESCRIBING REST FOR THE CURE
OF SURGICAL DISORDERS.

THE effects of rest and motion being, as we have observed in the first part of this essay, as diametrically opposite as their causes, and the too great inspissation of our fluids affording us a precise indication for the employment of motion, we might immediately conclude from hence, that whenever it becomes necessary, in the cure of surgical complaints, to increase the thickness of these same fluids, or any of them, it will be proper to call in the assistance of rest. This is a very natural consequence which should seem to point out both the cases which require the use of this method, and the indications which are to lead us in prescribing it. But in order that this consequence may be admitted, it becomes necessary to support it by facts, which present themselves in great numbers. In all fractures, for instance, where the advantages of rest are so evident, nature seems to require nothing but an inspissation of some of

our liquids. Is it not by the gradual concretion of a juice originally fluid, that she unites in the most solid manner, the bony parts that have suffered a solution of continuity? Is not this desired effect chiefly brought about by rest, and doth not motion put the greatest impediment to it? This circumstance is universally known, and not contradicted by any fact; but there are many other cases, in which nature appears to have the same views as in fractures, and in which the indications for rest are as precise as in these accidents. These cases, though not unfrequent, require a degree of attention and penetration to distinguish them, and it is by taking a review of them, that we shall find rest to be frequently the most certain method that art can furnish to the surgeon who knows how to apply it.

In my first anatomical pursuits, I had seen some spines of crooked persons, that presented three or four dorsal vertebræ, the bodies of which were soldered and confounded together, without having paid any particular attention to this disease, and without having reflected on the accidents it might have produced during its continuance; but a patient whom I saw at the Hospital in 1766, fixed my observation upon this object. Having been violently beaten, at the age of thirteen, by his father, he felt, a few months after, a weakness in the spine, attended with pain and a difficulty of keeping an upright posture. He at first walked with great difficulty, and afterwards could not walk without leaning upon a stick, with his body bent forwards. These first symptoms which continued more than six months, were followed by a fever accompanied with difficulty of breathing, and pain in the middle of the back, without any very apparent swelling externally. These symptoms were relieved by bleeding and other remedies, and the patient seemed restored to his former state; but the difficulty of walking and of supporting himself increased by degrees, and, at length, a tumour was formed towards the lateral and posterior part of the last false ribs, the increase of which was very slow, and made no change in the colour of the skin. This tumour extending itself gained the region of the loins, and more than six months after its appearance, the skin became inflamed, grew thin, and
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by the assistance of maturing poultices applied to the tumour, a fistulous opening was made in it, from whence there issued, according to the patient's account, more than a quart of matter as white as milk. This discharge having continued very plentiful for three months without hopes of cure, the parents, tired with the length of the disease, took the resolution of sending this young lad to the Hospital. When he came there he had a fistulous opening on the right side of the lumbar region, which furnished an ichorous and plentiful discharge; a slow suppuratory fever accompanied, and every appearance seemed to shew that death would soon terminate this disorder. A pledgit of soft ointment only was put upon the fistulous orifice, and the disease was left to nature.

I frequently saw this patient, who being better fed, and more attended to than at home, began to recover a little from the deplorable state to which he had been reduced. He particularly kept very quiet in his bed, and his spine was then incurvated with an evident projection outwards, towards the last dorsal vertebræ. About two months after he came into the Hospital, the matter which oozed from the fistulous opening, grew thicker and less plentiful, the countenance appeared better, the pulse less frequent, and he began to give some hope of recovery. This hope was more confirmed six weeks after, for the discharge was still lessened, and the patient began to feel some degree of strength in the spine. Two months after this last period, the fistulous orifice was closed, and the patient began to walk with a stick; but he was crooked, and seemed to have lost much of his former height.

From the accidents this patient had undergone, and the deformity the spine had contracted during the course of his disease, I imagined that some of the dorsal vertebræ had been affected with caries; that the remains of them after being confounded together, and after having been in a state of granulation, had at length acquired a degree of solidity sufficient in some sort to supply the bodies of these bones. I could not but consider rest as having been the chief promoter of this salutary end; and

and subsequent facts appear to have completely confirmed my conjectures on this point.

First, the patient who had been the subject of the preceding observation, and whom I had always kept within my notice, having been seized in 1769 with a peripneumony of which he died, I was allowed to inspect the body, and my first care was to take notice of the disorders the spine had experienced three years before. I found, as I suspected, several vertebræ, the bodies of which were confounded with each other; these were the ninth, tenth, and eleventh, of the dorsal vertebræ, which had lost at least half of their longitudinal dimensions, while their spinal processes which had not suffered the least alteration, formed a projection and a remarkable convexity outwards. This first part of my conjectures being verified, I have neglected no opportunity of informing myself, what share rest might have had in these sort of cures. Accordingly I have questioned all deformed persons, whenever I could do it with propriety, and desired them to give me an account of the accidents that had happened to their spine previous to its deformity. Those who are become so, merely from a lateral projection of this column, without having had any collection of matter during the growth of this projection, or after it was formed, have scarce complained of any thing more than a gradual weakness of the part affected, and have never been obliged to keep from motion entirely. They have almost all been able to rise out of bed at all times, and even to walk with a stick without experiencing any very acute pains. But those in whom marks of former abscesses were to be observed, who in some small part of the spine have an evident projection and convexity outwards, have all been obliged to keep their bed for several months, sometimes for whole years; and it was never till after a long-continued rest, that the spine began to recover, at the part affected, a sufficient degree of solidity to allow them to support themselves and to walk.

If rest, such as it might be, without being subjected to any rule, hath produced good effects in these cases, we may readily conceive that it would

would have been attended with much greater advantage, had it been prescribed and employed with discernment ; still however this kind of disease presents us with precise indications to determine the use of it. It may even be presumed, that it would prove one of the most certain means that could be employed to prevent deformities of the spine⁽²²⁾, for it is not at the time this column discovers a tendency to projection, that we ought to leave it oppressed by the weight of the superior parts which it should naturally sustain. We should wait, till by rest and a horizontal position, the pieces that compose the column shall have lost, by the use of proper remedies, that morbid state of softness which had disposed them to be thrown out. These two means, of rest and a horizontal posture, are equally indicated whether the progress of the disorder be assisted by a weakness of the ligaments connecting the vertebræ, or by the action of the muscles. But these unions of the vertebræ, after a greater or less destruction of their bodies, which we have observed to happen in the dorsal vertebræ, may also take place in the lumbar vertebræ ; and might not rest contribute to effect this salutary purpose in cases of caries with which the vertebræ of the loins are so frequently affected ? Let us consult facts, that we may know how far this remedy is to be depended upon in the cure of so terrible a disease.

I have seen many of these carious vertebræ, and the death of all those who have been attacked with them, seems to proclaim that they are an incurable complaint. But before we lay down this dreadful prognostic, let us trace the disease throughout its progress, and let us consider the phenomena it presents to us during its long continuance ; these may suggest some ideas from whence a more comfortable prognostic may be deduced, and which future facts may perhaps justify. We frequently see, after a fall on the buttocks which shall have occasioned a concussion in the lumbar vertebræ, after a blow received on these parts, after a violent and painful effort made to raise too heavy a load &c., after such accidents, I say, we frequently see that the persons who have suffered them, complain, some time after, of a dull pain in the region of the loins, with a difficulty of walking, which increasing gradually, without ever
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causing any very acute pain, ends, at length, in so great a weakness of the spine, that they are no longer able to support themselves, and are obliged to keep in bed. At this period, which is often nine or ten months after the accident, we generally begin to perceive a tumour which makes its appearance either underneath Poupart's ligament, or on the side of the great ischiatic foramen, and which increases slowly without being painful to the touch. When the tumour hath acquired a certain size, and that the matter which forms it is sufficiently advanced towards the skin, a manifest fluctuation is observed in it, which seems to furnish a positive indication for the opening of it^(b).

The Surgeon who makes this opening, and who sees that he has given issue to a great quantity of matter, confined for a long time in swellings of this kind, congratulates himself upon an event which he thinks cannot but turn out for the good of his patient; but the patient, who for some months past had experienced no evident degree of fever, who suffered but little, who had perhaps preserved his appetite, who slept, and who had complained of no other symptom but that he could not keep his back upright, is far from being relieved by this operation, at least if he be, the relief is not of long continuance; for the matter forming the tumour, which at the time of the opening was white as milk and without smell, soon contracts a considerable stench, a fever comes on, the pulse becomes quick and small, and the patients pretty frequently die towards the thirteenth day^(c). The body is afterwards opened, when a caries of two or three of the lumbar vertebræ, and often of part of the os sacrum, presents itself to the view; and after this discovery, the Surgeon is far from imputing to his own management the speedy death of the patient.*

It is proper, however, to observe, that this patient had lived several months, without any considerable inconvenience, with this caries, and

* Many of these and subsequent observations have been adopted by Mr. JUSTAMOND, in his *essay on abscesses*, as containing that gentleman's entire sentiments on the subject. H.

with this tumour though it contained a large collection of matter: his state would not even have been changed so suddenly, if an opening had not been too precipitately made. We shall be convinced of this by attending to what happens when these tumours are left to nature; if they burst, the opening is made much later, and it is only at this period that patients are seized with any alarming symptoms, and that too in a much less degree than after the opening has been made by art^(k). The reason of this is certainly because nature procures no more than a very small issue to the matter. If the patients then die, they perish much later than in the other instance. This difference in the event teaches us at least that we must not meddle with these tumours, that we must apply nothing to them to hasten their opening, since nature appears to disapprove of their bursting, as a termination that is not usually according to her wishes. But here some one perhaps may say, that a disease of so terrible a kind is beyond the resources of art and the efforts of nature. Let us beware of deciding this matter so lightly; and of assigning limits to nature which she hath not prescribed to herself; for since we have instances of caries of the dorsal vertebræ cured by her assistance alone, why should not her power be extended to the cure of caries of the lumbar vertebræ, if her operations were not disturbed by improper measures? At least the following is a fact which seems to prove, that this disease is not beyond her power of relief.

A young woman of twenty-two years of age, after having fallen on the bottom of her back, down a staircase, felt, for a considerable while, a pain, more or less acute, in the region of the loins, and was seized with a gradual weakness in that part, which, in a short time, prevented her from walking, and even from supporting herself; at which period, she applied to me. Revolving in my mind these symptoms and the cause that had produced them, I imagined her case to be a disease of the lumbar vertebræ, and the best means of cure that could be prescribed were rest, and lying a bed. I explained to her the imminent danger of her situation, and engaged her punctually to follow my advice. This she did very exactly, by going to bed and remaining there constantly, taking

care to exert as little motion as possible, agreeable to what I had recommended. Notwithstanding these precautions the disease continued to advance; the weakness of the loins, and the pain she felt there upon motion, were accompanied with a tumour that began to make its appearance under Poupart's ligament, which became, in process of time, as large as ones fist, and which at length discovered an evident fluctuation. Warned by the melancholy end of all those in whom such tumours had been opened, I carefully avoided applying any thing that might hasten the bursting of it, and abstained still more religiously from opening it with a cutting instrument. This tumour, with fluctuation, after having acquired its full size, remained nearly in the same state during four months, and at that period began to be imperceptibly dissipated, so that in four months afterwards, there remained not the least vestige of it; the patient felt from one week to another, that the spine was recovering its former strength; she began to sit upright in her bed, while her back was supported; she then made a shift to walk with a stick, and was at length capable of walking alone and unsupported with as much firmness and confidence as ever; but the happy termination of this disease was owing to her persevering for near a twelvemonth in keeping her bed, and in a state of rest.

This is one of those surprizing cases that seem to be an open page presented to the practitioners of our art, in which nature invites them to meditate her walks, and teaches them to do nothing that may disturb her intentions. She shews us here a large collection of matter, to the evacuation of which, in conformity to the principles received, we should have proceeded as soon as the fluctuation had been evident, apprehending lest a longer confinement of it should produce mischief. And yet we see that this same matter, after having been collected for several months in a distinct cavity, has been received again into the course of the circulation without occasioning the least accident; and that the principal disease produced by it has been cured, without the concurrence of art, otherwise than in prescribing rest, already so loudly called for in this instance, by that same nature who has directed the cure⁽¹⁾. Instead of
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silently admiring such a phænomenon, it is the province of a man, intent upon the improvement of his art, to endeavour to give such an explanation of it as shall not be disavowed by nature, whose interpreter he is to be.

Let us consider what this disease exhibits to us in the first instance. A disturbance of the organization in the bodies of the lumbar vertebræ, by means of a shock conveyed to them, or a violent divulsion of the ligaments that unite them. The swelling of the parts being the consequence of these first accidents, and a slow inflammation coming on, this at length causes a suppuration and abscess, the seat of which is in the neighbourhood of the parts affected. The organization of the bodies of the vertebræ being depraved^(m), it follows, that small separations or scales must be thrown off from these bones, which is as much effected by the organic action of the inflamed parts, as by the matter they furnish. This matter itself after having been efficaciously employed in separating the corrupted from the sound parts, is also the medium to which nature intrusts the care of expelling and carrying them out; but this purpose is effected very slowly. These bony fragments, of greater or less dimensions, being detached by means of the matter, float in that liquid, to which they present a greater extent of surface in proportion as they are more divided. The pus itself in which they are steeped, becomes a menstruum proper to dissolve them, and its quantity increasing in proportion to the continuance and extent of the suppuration that separates the loose pieces of bone, it at length makes a passage for itself towards the depending parts which afford the least resistance. It is generally underneath Poupart's ligament that these tumours manifest themselves; but the matter is still sheltered from the external air, and undergoing no change, produces no mischief in the parts that surround it. The fragments of bone which float in this quantity of pus, may at length be totally dissolved in it, so as to form a homogeneous mass, which perhaps may not then in any wise differ from our most elaborate nutritive juices⁽ⁿ⁾. This being premised, we need not be astonished, if, at this period, nature, after having employed the pus as a menstruum to dissolve

the bony fragments to the separation of which it hath contributed, should resume it into the general course of the circulation, by taking it up from its cavity, through means of the several absorbents that open on the surface of that cavity. The return of the matter being then effected as slowly as its collection was formed, the parts which compose the cavity, must return to their proper state as gradually as they were disturbed from it, without accident and without inconvenience.

With respect to the bones that are primarily affected, and which have almost adopted the nature of flesh during the long and important process of exfoliation, no sooner are they disengaged from these loose pieces, than they begin to recover their solidity; and if several vertebræ, for instance, have partaken of the injury, they form among themselves a common mass of ossification that in some measure supplies their bodies, and terminates this important cure, which, as we may observe, can only be the work of nature, time, and rest (²³).

But however advantageous rest may be, however pointed may be the indication for it in the instances before mentioned, there are still other cases of caries in which this indication is more precise, and less liable to be mistaken, than in those of the dorsal and lumbar vertebræ; these are the caries affecting the joints. The ligaments, or the articulating surfaces of the bones, often suffer injuries in their organization, which cannot be removed by the usual remedies employed in the beginning, in cases of concussions, wounds, fractures, &c.; or where these injuries arise from a fault in the habit, they oftentimes will not yield to the remedies proper to resist the action of any acrid irritating principle that may have been fixed upon these parts. In these instances nature, who always tends towards a cure, hath a very great labour to perform, in the prosecution of which we must be careful not to disturb her by any indiscreet manœuvres; in order that this labour may turn to the advantage of the patient, nothing is required but time and rest. Here, as in the other cases, nature avails herself of the usual resources; she forms pus, by means of which fluid she separates from the whole, the bony, ligamentous, and cartilaginous

nous parts that are vitiated, from whatever cause; and the deposits, in the cavity of the joint, these fragments, together with the pus that has separated and conveyed them there. This pus, after having employed more or less time in melting down these fragments, might possibly, as in the instance above cited, be re-absorbed into the general mass without inconvenience. My practice has not furnished me with any instance in which nature hath followed this plan in such cases; but the following is the most ordinary way she chuses, and which she also frequently adopts in caries of the dorsal as well as of the lumbar vertebræ.

The pus, which till the time of the complete dissolution of these fragments, seemed to exert no sensible corroding power upon the texture of the skin that confines it, after coming nearer and nearer to this external covering, at length raises in it an inflammation of a very small extent, and by means of the suppuration set forward in it, a fistulous opening is made, which gives vent to a large collection of matter that hath often been from seven to eight months, and more, in forming. By this contrivance the pus being evacuated by degrees, and the air not having access to its cavity, it doth not acquire that state of decomposition which makes a destructive principle of it. The irritating faculty of the pus scarce shewing itself till all the fragments, as well bony, as ligamentous and cartilaginous, are completely melted down, it may reasonably be presumed, that the pus is as it were neutralized by the principles they impart to it, and that they are these fragments which maintain it in that mild and unctuous state we observe it to be in before this perfect dissolution. What I have said upon this point becomes so much the more probable from the circumstance of my having rarely found any bony fragments in the matter of those abscesses that have opened of themselves, and that I have always seen them in those collections which have been opened before the time intended by nature. It is plain however, that during a work so long continued, and so prudently directed, nature must have been in particular want of rest in the part where she was carrying on these operations, and that motion could only interrupt and trouble them. But if rest have been hitherto useful, it is no less necessary to conduct

conduct a cure, so happily and so wisely begun, to its end; for the bony and cartilaginous surfaces being now disengaged from all the fragments nature hath chosen to separate, presents us with lively and fleshy granulations, which are in that state of inflammation proper to contract an adhesion with contiguous granulations of the same kind. This adhesion consolidates itself by degrees, and forms at length a compleat union between two bony surfaces, destined originally to move one over the other. But in order to obtain this salutary ankylosis, nature requires rest, and rest continued with the greatest perseverance. In this great and admirable operation, she hath lost nothing but motion; and by this indispensable sacrifice, she has preserved a limb with part of its functions, and prevented the mutilation of the machine.

The description I have here given, is not a romantic idea of physiology and pathology; it is a truth founded on fact, of which I can myself give many instances. I have got a preparation by me in which the thigh bone is soldered with the os innominatum, and the polished ossified surface of which, together with the solidity of its union, leave me no room to doubt that the subject it had been taken from, had survived a long time the formation of this ankylosis. Not having known the person, nor been acquainted with the history of his case, I can only form conjectures upon this subject. But the neck of the thigh bone being extremely shortened, it is to be presumed, that its ankylosis with the os innominatum has been produced by a caries, which may have attacked the head of the bone and the cotyloide cavity in which it was lodged; and that this union has been preceded by abscesses, and other symptoms common to a caries of the joints. The following fact will contribute to support this opinion.

A poor beggar who has an ankylosis of this nature, and in whom I had frequently noticed scars at the upper part of the thigh, as well on the inside as on the outside, hath assured me, that after a fall upon the great trochanter, he had for a long time suffered extreme pains, which had been at length terminated by successive abscesses, that had kept him
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in hospitals for several years, and had frequently brought him into a very dangerous state. His thigh, which forms almost a right angle with the trunk, being evidently much shorter than the other, there is no reason to doubt that this effect has been produced by the destruction of the head of the thigh bone, by a caries which nature must have succeeded in the cure of, by following the track I have just been describing.

But what I have not had an opportunity of observing myself with respect to the articulation of the thigh with the os innominatum ⁽⁸⁾, I have observed in articulations of the thigh with the leg, and of the leg with the foot. I have seen in these joints, abscesses attended with caries, which after having made for themselves, in a long course of time, fistulous openings, and after having furnished, for years, a discharge more or less plentiful, have at length ceased to suppurate; and have left nothing more than a complete union of the articulating surfaces that had been destroyed. But these great cures have all been owing to nature, and art has concurred in them no farther than in preventing every kind of motion, every change of posture, which might keep up the irritation of the parts affected ⁽⁹⁾. Dressings seldom, very seldom renewed, and an attention to place the limbs at rest between junks, as in fractures, have been the only means employed ⁽¹⁰⁾.

I might possibly have obtained the same termination in a caries, with an abscess, in the articulation of the os humeri with the scapula, had I not yielded to the temptation of giving vent to a large collection of matter that began to shew itself by an evident fluctuation. But at that time I had not been sufficiently informed by my own mistakes. The event was fatal to the patient, who died of a suppuratory fever, after having fallen into a marasmus; and though on examining the part, I found a caries of the head of the os humeri, and of the glenoide cavity of the scapula, a disease hitherto deemed incurable, I have not been the less persuaded since, that the operation I had performed, if it had not immediately caused, had at least hastened the death of him whom it had been intended

intended to relieve. Some subsequent facts have entirely confirmed me in this opinion.

A man about fifty years of age applied to me in 1770, with the bones of the wrist so carious, that in two or three places one might pass a probe through them, by following some fistulous openings that presented themselves on the outside. The wrist and the hand, which were œdematous, considerably swelled, and of a dark blue colour, seemed to require amputation so much the more urgently, as the patient was tormented with a slow suppuratory fever; it was even the advice of a man very skilful in the profession, not to defer having recourse to this last resource. Notwithstanding this, I ventured to temporize, and after having applied the usual dressings for two days, I carefully closed all the fistulous openings with dressings that were not irritating, and the hand and wrist being covered with compresses dipt in a balsamic and spiritous embrocation, made with the yolk of an egg, oil of roses, and brandy, I placed them in junks. The parts being thus kept in a perfect and constant state of rest, I made no scruple of leaving the first dressings on for ten days without a renewal, more especially as neither the pain nor the discharge required them to be removed sooner; and at this time, it was curiosity, rather than any absolute necessity, that was the motive of my doing it. As I found the discharge less in quantity, thicker, and less fœtid than when the patient was dressed every day. I judged it proper to put off the removal of the second dressings for twenty days; and at this period the swelling of the hand and wrist were half reduced, and every thing seemed to bespeak, as much from the patient's countenance and pulse, as from the nature of the discharge, that hopes might already be entertained of a fortunate termination of this dreadful disease. In about two months and a half after this, these hopes were completely realized; for at this time all the fistulous orifices were perfectly cicatrized, and the cure was terminated, with no other inconvenience to the patient, except loss of motion in the wrist, which has not since prevented him from doing his usual work (r).

But

But what absolute rest and unfrequent dressings have effected in combination with nature in the instances just mentioned, they have also done under my inspection, in two cases of caries of the articulation of the arm with the fore arm. One of the patients in whom this disease had come on after fracture, with splinters and abscess in the joint, had even been sent to me in order that I might amputate the limb; the surgeon who had taken care of him for several months past, judging there was no other way of putting a stop to the symptoms which attended this caries. And indeed, a very considerable and œdematous swelling of the elbow joint and neighbouring parts, a plentiful and offensive discharge, a total loss of appetite, a slow and suppuratory fever, two fistulous openings that penetrated into the cavity of the joint, and through which a probe being introduced, discovered a very extensive caries, were all symptoms sufficient to justify the operation. Yet in this case, dangerous as it was, a few months of total rest, joined to long intervals between the dressings, having assisted the salutary formation of an ankylosis intended by nature, have made all the symptoms disappear, and have effected a perfect cure of this disease, with no other loss than that of the motion of the joint.

Here are already a number of facts brought in support of what I have advanced, that whenever the inspissation of any of our fluids is required in the cure of any surgical disease, rest must be called in for this purpose; but there are other facts, and of a very different kind from those I have here alledged, which confirm the truth of this assertion. Wounds and ulcers, for instance, in the cure of which rest is prescribed with so much efficacy, do they present any other indications for the employing of this method, than such as are derived from the necessity nature is under of giving the gelatinous liquid that oozes from their surface a sufficient degree of consistence? This consistence is not only necessary that it may be enabled to supply, in some sort, the place of the skin that is destroyed, by forming the external scar that completes the cure; but also, that in the part beneath this artificial covering, it may supply the want of the cellular substance, that natural connecting medium of our

parts, which has been destroyed by the suppuration. For we are not to imagine that the gelatinous concretion which we observe in scars, is confined to what we see of it outwardly. Motion, far from assisting in this good effect, cannot but prevent it, by destroying the adhesions already begun underneath the part where the scar is to be made, by putting an impediment to the necessary concretion of the gelatinous fluids that are to form it, and even by destroying it when it has not acquired its utmost degree of solidity, as we are taught by experience, particularly in the cure of ulcers of the legs. Here the indication for rest to the part affected is so positive, that they never can be firmly healed without the help of this method, and that excess of motion alone, without the concurrence of any other circumstance, often makes them burst out again after they have been completely healed.

From hence it may be concluded, that we must be careful to prescribe rest for the part affected, during the cure of wounds and ulcers (*D*). This attention must even be continued beyond the time of the complete formation of the scar, in cases where the muscular parts underneath it are exposed to frequent motion; and it must be carried still farther when these same parts have been affected by the disease, because the gluten, supplying the place of the cellular substance which connected the muscular fibres, may not have acquired at first a sufficient degree of consistence, to resist the efforts it must then be exposed to by a strong contraction of these parts. The following fact will evidently prove how useful such a precaution is in this last circumstance.

A Journeyman Taylor, after having had an abscess by congestion, came to me in 1776 with a fistulous opening, which was already of some continuance in the upper, external, and rather posterior part of the thigh, about two inches below the great trochanter. I passed a probe into the fistula, which furnished a large quantity of serous, and somewhat fœtid, discharge, and found that it passed under the external and anterior muscles of the thigh, pretty near the bone, and that it extended about six inches beyond its external opening, taking its course towards the joint.

joint. At first, I apprehended some caries of the bone, but having met with bony particles in the way of my probe, I thought it proper to treat this fistula by laying it open through its whole extent, by which I might be at liberty to act as circumstances should require, if, at the time of the operation, I should find that the disease was complicated with caries. The fistula being opened through its whole extent, and appearing confined to the fleshy parts, I should only have made a simple incision, had I not been assured from experience, that in two or three days, notwithstanding all my endeavours to the contrary, the bottom of the diseases would have been concealed from me by the distention, and even by the re-union of some of the sound divided parts. But foreseeing this inconvenience, which I had before experienced several times in similar cases, I removed some portions of the fleshy parts, and dressed the wound to the bottom and rather close. I continued this precaution during the whole of the cure, which went on as usual in other simple wounds. The fistula began to fill up, and to consolidate itself gradually, the edges of the divided parts sunk by degrees, and in two months, formed almost a complete cicatrix, which seemed to promise a certain and speedy cure. But at the time when the scar was just closing, the patient, who had constantly kept his bed, having risen and walked more than he ought to have done, felt, a few days after, some pain; a redness appeared through the whole length of the scar, with a small projecting blueish point in the middle, which having burst with my nail, a small opening presented itself, from whence there issued a kind of bloody and serous discharge. I thought at first that this opening was not deep, but having probed it, I had the chagrin to find, that all I had done was in vain, and that there was now a fistula almost as extensive as when I first undertook the case.

This discovery soon made me suppose, that the action of the muscles, at a time when the scar was yet recent, might possibly have destroyed the adhesions formed between the parts that answered to the channel of the old fistula. I proposed therefore to confine this action, and even to annihilate it in those parts, till they should have acquired a solid coherence

between themselves. To effect this, I placed on the channel of the fistula a thick roll of wetted lint, and applied over it, thick, graduated compresses, exactly maintained, and strongly bound on the part by means of a bandage carefully rolled on. This precaution, continued for some time, made me hope that I might cure this complaint without having recourse to a fresh operation; but the patient rising out of bed, instead of using a bed pan, and the motion he gave to the part loosening the bandage, I obtained only a partial success from it.

The fistula indeed closed itself, but this was frequently only for a few days, and though it was not so deep as before, yet still the little sinus that remained, made me always apprehend a return of the complaint. To get rid of this anxiety, I determined to pass, for two days, into the sinus, a piece of lint impregnated with some digestive ointment animated with precipitate. At the end of two days I omitted this tent, and renewed my bolstering and compression on the whole extent of the sinus as before, with the additional precaution of placing the limb in junks and other supporters, as I should have done for a fracture of the upper part of the thigh bone, or of its neck. By all these attentions, I at length succeeded in obtaining a perfect cicatrix; but that I might not be exposed to a relapse, I continued them perhaps beyond the time necessary to effect my purpose, chusing rather to use too much precaution in this case than to neglect any.

By judging from this fact, it should seem that nothing is required in the cure of sinusses, except the contact of the parts which form the channel, and a perfect state of rest for as long a time as is necessary, that they should contract solid adhesions between themselves. Are there not a variety of cures, effected in these complaints by exact and well-maintained compressions, which confirm this truth? Even the precautions by which I succeeded in the cure of the case above mentioned, do they not almost argue the inutility of the great operation I had at first attempted⁽¹⁾? At least they tell us very plainly, that we must not re-

fort to such an operation, till compression, employed with all the sagacity which different cases may require, has been found insufficient (^u).

Even fistulas of the anus present some precise indications for the employment of rest. The division of the nooze or bridge of flesh that lies between the two openings forming the fistula, does nothing more than protect the parts forming the nooze, from that habitual motion which prevented their re-union. When they are once divided, they enjoy, in comparison with their former state, a degree of rest sufficient to allow the cicatrix to be formed throughout the whole ulcerated extent that formed the sides of the fistula. We may even observe, that the healing of the wound is never more surely and more speedily effected, than when by means of a soft tent, we make our dressings press a little upon all the diseased part; for they are not the ointments with which these tents are covered that perform the cure, since I have often effected this without their assistance. Neither is it the passing of the excrements that puts an obstacle to the cure; since I have seen perfectly cicatrized in a short time, fistulas, in which the wound was constantly covered with fæces. But the use of the tent is so far from being an indifferent matter, that I have often observed the fistular canal to become ulcerated again, when this compression was left off too soon after the formation of the cicatrix.

From these observations, the propriety of which must be evident, it follows, that it might perhaps be possible to cure fistulas of the anus without either incision or ligature. A careful compression, made by means of a pretty firm tent, introduced much beyond the internal orifice of the fistula, might be the more likely to succeed in the cure of this disease, if by previous evacuations and a strict diet, the first discharge of excrement could be delayed till the sides of the fistula should have acquired an adhesion sufficiently strong and firm, not to be destroyed by the contraction of the sphincter. These are trials to be made, if they have not yet been attempted, and the effect of them I shall soon have an opportunity to determine.

But

But if rest of the parts concerned, be indicated in the cure of fistulas, of which there is no doubt, it seems not less so in the prevention of them. Abscesses which happen in the circumference of the chest, and which so frequently remain fistulous, whether they burst of themselves, or whether they be opened by small incisions, become so merely from the continual motion annexed to the parts in the extent of which they are formed. But there are means of restraining this motion, and of keeping these parts in a state of rest necessary to bring about their cohesion. A free incision, carried even across the muscles that cover these abscesses, openings extended according to the direction of the sinusses they present, compressions disposed with skill, &c., are the means by which we obtain this desirable effect, which is almost a certain warrant of a radical cure. It is indeed constant, that compressive dressings, so efficacious in the cure of most wounds and ulcers, are in these cases of still more remarkable advantage than in any other; and that the state of rest in which they maintain parts naturally moving on each other, by enabling nature to work with effect in uniting them, prevents fistulous ulcers, which would often have been the consequence of not attending to restrain the natural motion of the parts.

From what has already been said, it appears how numerous the indications are for the prescribing of rest in surgical disorders; though we have only mentioned those in which nature requires an inspissation of some of our juices. But the indications which call for the use of this principle are not limited here; they are applicable to so many surgical diseases, that we may consider it as the most extensive curative medium the art can employ. The cases we have already gone through will impress an idea of the truth of this assertion, and those which remain still to be explained, will give it the highest degree of evidence. But we shall go through them in a summary manner, because the indications which most of these cases present for the application of this method, are too positive to be mistaken; and the employment of it then becomes a precept of the art.

Is it not, in fact, an established rule, that we must have recourse to rest in all surgical disorders, where motion may impede any salutary cohesions, or may occasion pains, irritations, or frictions that may bring on disagreeable consequences, or may displace parts that should be kept in the situation they are, or may produce dangerous effusions of blood, &c. ? Therefore, in cases of recent wounds we wish to re-unite, in dislocations newly reduced, in ruptures attended with bad symptoms, and which have been just returned by the taxis, in losses of blood which come on during gestation, in cases of wrenches and forcible extensions of the ligaments, in ruptures of these parts, as of some muscles and tendons, in contusions of the joints ; in all these cases, it being evident that motion indiscreetly employed is liable to bring on great mischiefs, these mischiefs themselves are so many absolute indications which direct the prescribing of rest. Besides, experience has so fully proved the necessity and advantages of this method in all such cases, that it would be needless to insist any longer upon it.

We shall only observe, that in cases of shocks in the joints, and of divulsion, and contusion in the ligaments that surround and strengthen them, as motion necessarily produces pains which cannot but increase the irritation, tension, and inflammation which usually attend these accidents from the first, rest presents itself as the most efficacious method of cure that nature can furnish under such circumstances. We ought then to rely upon it the more, as it cannot be supplied by any thing else ; for all that art should attempt, is only to mitigate the pains, to assuage the irritation and tension of the parts, and to prevent inflammation and the fatal suppurations it may occasion. Now, amidst all the methods that art can suggest to counteract these effects, rest is the most powerful ; bleeding, diet, and external applications being only accessory helps, the efficacy of which is so much the more evident as they are combined with this principal agent^(w). But supposing that these means should have been neglected in the first instance, or that notwithstanding the application of them, abscesses should be formed in the cavities of the joints, and that the surface of the bones designed for their motion should be affected with

with caries; rest, at this period, and in the subsequent treatment of the disease, as we have before proved, is one of the chief methods of cure corresponding to the views of nature.

We cannot likewise but be sensible of the efficacy of rest in inflammatory tumours of the testicles, and in a falling down of the womb. Is it not also evident in cases of commotion, either of the spinal marrow, or of any of the important viscera that are contained in the abdomen, the thorax, and the cranium? The accidents which follow these commotions, being always the effect of a violent degree of motion communicated to these parts, do they not present us with positive indications for the prescription of rest ^(x)? I have seen a young lady of nineteen, who, after having by chance jumped some few steps off a staircase, remained senseless for several hours. She afterwards fell into swoonings every time she wanted to sit upright in her bed; and it was only by rest and a horizontal posture, persevered in for several months, that she was completely cured of this accident.

From what has been already said, therefore, we may be convinced that rest, as well as motion, is indicated on so many occasions, that we might strictly affirm these two means of cure to be universal and exclusive; and, what is more, there are infinite numbers of reasons that present themselves in support of this conclusion. The disorders which the animal œconomy may experience, are, in fact, nothing more than the produce of an excess or deficiency of motion ^(y); and nature and art cannot really succeed in repairing these disorders, but by increasing the power of motion when it is too weak, and diminishing it when it is too strong. Nature, indeed, in all her efforts to cure, clearly shews us these two points of view, to which all that medicine and surgery can prescribe, in the disorders belonging to their respective province, is obliged to conform itself. But amidst the several curative means, to be able to chuse those which can produce either of these effects, in the exact proportion required for the recovery of health, would be the utmost perfection of our art; to which human skill, however, can never expect
to

to attain. In endeavouring, therefore, to shew, in this essay, the advantages that may be derived from motion and rest in the cure of surgical affections, I have, indeed, only given a sketch of the subject. May the other competitors give complete satisfaction to the members of the academy upon this point, and present them with performances worthy of themselves!

E c

NOTES

MOTION AND REST.

to state. In examining the theories, to show the effect of the motion, it is evident that they are derived from motion and rest in the case of the motion. I have, indeed, only given a sketch of the theory. But the other considerations, and especially the application to the motion of the body upon the point, and the effect of the motion upon the point, are of the same nature.

THEORY OF MOTION AND REST.

N O T E S

BY THE AUTHOR.

(a) **T**O the observations contained in MONSIEUR QUESNAY'S *Memoir upon Wounds of the Brain*, (printed in the first volume of the Memoirs of the Academy of Surgery,) where this fact is established, may be added, the observation of a rod of iron having passed through the brain, without causing the death of the patient—*Journal de Medecine*,¹ August 1777.

(b) The ganglions of the cervical and intercostal nerves, and of those which are placed in the cavity of the abdomen, are they not, as Mr. LE CAT has asserted, with so much probability, in his dissertation on the nervous fluid, which obtained the premium at Berlin, in 1757; are they not particular organs, in which the fluid undergoes elaborations, and receives qualities relative to the functions of each of the viscera, to which the nervous filaments proceeding from these ganglions are distributed?

(c) I mean the fluid which forms the connection between the material and spiritual parts of our being.

(d) This medium comprehends a certain latitude, within the limits of which, health is included.

(e) By these bounds we are to understand the *quantity* of life, not the *duration* of it. A valetudinarian lives, but he enjoys a less degree of life than the man who is in full health.

(f) The following fact will prove, that however inconsiderate such a practice may be, there are still many persons who follow it.—A country surgeon, being called some years ago to reduce a fracture of the olecranon, did nothing more than place the fore-arm in a state of extension, and maintain it there by a bandage and some splints. Twenty days after the accident, the parents of the patient called in the assistance of two surgeons from a neighbouring episcopal city. They exclaimed openly against the practice that had been pursued, and decided, that as an anchylosis was the unavoidable consequence of such a fracture, the bent posture of the fore-arm should be preferred to its extension. Accordingly they exerted all their efforts to separate the union already begun, and placed the fore-arm in a sling. This fact was told me, a few months after, by one of the surgeons concerned, who related it as a proof of his own judgment, and of the unskilfulness of the first surgeon employed, who probably had not been directed in his practice by reflections drawn from the nature of the disease; otherwise he would not have suffered practices so repugnant to the good principles he would have adopted: for to place the fore-arm in a bent posture in a fracture of the olecranon, is the same thing as bending the leg upon the thigh in a fracture of the patella.

(g) I say a moderate extension, because a too strong one, especially if the olecranon were fractured near its origin, would push the cubitus too much forward, and prevent the fractured surfaces from being adapted to each other. This would occasion, after the union was completed, a
bony

bony projection on the side of the joint, which might totally impede its motion. If the fracture should have happened nearer to the extremity of the olecranon, the forcible extension of the fore arm would make a gap between the fractured pieces on the side of the cavity of the joint; the olecranon would consequently become somewhat lengthened, and thrown up, and the effect of this injudicious practice would at least be a difficulty and a decrease of motion.

(b) Upon this subject may be seen the second part of my Essay on Counter-strokes in other Parts of the Body besides the Head, which obtained the prize in 1771, under the the name of John Martin Bazille. *Prix de l'Académie*, VOL. IV.

(i) I have seen some persons attacked with this disease, in whom the symptoms, before the opening of these abscesses, had not been more intense than those here mentioned; and who, after the evacuation of the matter, have perished at the period I have marked.

(k) I have at present under my notice a very striking instance of what is here advanced. A young man of four-and-twenty years of age, who has an abscess in the loins after a disease of the spine, so evident, that it forms a pretty considerable projection, had experienced, during the formation of this abscess, no other symptoms than a debility of the spine, attended with a dull kind of pain, without any remarkable fever or loss of appetite, &c. But this abscess having at length burst itself, the patient was seized a few days after with a strong fever, and a total loss of appetite and rest, which gave reason to apprehend that the disorder would soon terminate fatally. But after he had continued a fortnight in this alarming state, he began to grow better; the discharge, from being ichorous and offensive as it was, loses daily its bad smell, and acquires a better consistence; the pulse becomes more regular, and every thing seems to promise, that with time and rest, the patient will escape with no other inconvenience than that of being a little deformed.

Such

Such was the state of this patient, when this essay was sent to the Academy; and it had been so much mended since that time, that the cure appeared certain. The patient had recovered his appetite, digested well, the matter which issued from the fistulous opening was thick, and less in quantity, the spine gathered strength daily, and the patient began to walk with a stick. But the spine being more crooked than I at first imagined, I thought that by bringing it gradually to a state of extension, while the intermediate substance which was to supply the place of the bodies of the vertebræ was still capable of yielding, the deformity might at least be partly corrected, or its farther progress prevented. With this view I ordered him to lie on his back, and placed a small bolster under the part of the spine that projected. The desire the patient had of being cured without deformity, induced him to bear the pain this brought on, without complaining. He no longer slept at night, and though I made him change his posture, and removed the bolster as soon as he had told me of the pain he suffered from it; yet I had the mortification of seeing, that the symptoms which had disappeared, immediately after this trial, returned. The discharge became more and more plentiful; a slow fever appeared and continued; a tumour even, but very deep seated, manifested itself on the loins opposite to the fistulous opening; and there came on at intervals, a loss of appetite, a diarrhœa, and after six months gradual decay, the patient died. Though I found, on opening him, the bodies of the two last dorsal vertebræ entirely destroyed, and an incomplete union between the bodies of those vertebræ that were in contact, I am not the less persuaded that the patient would have been cured, had it not been for that unseasonable extension of the spine, which brought on the return of the pain, and of the other symptoms. When nature, for the preservation of an individual, makes a sacrifice of the motion, or of the figure of any part, it is often necessary that art should not strive against her in attempting to restore what she gives up, but should only be the spectatress of what is going forward. This fact, and some others which will be recorded in a collection of observations I am preparing to give to the public, will furnish sufficient proof of this assertion; and in this respect I shall not
hesitate

hesitate to confess my mistakes. The history of these, oftentimes proves more instructive to others, than that of our successes.

(*l*) The impossibility of walking, and the necessity of keeping in bed, which attend this disease, are a proof of this.

(*m*) It is always the depraved organization of the bones that causes the caries and the desquamations; but this depravity may be produced, not only by the action of some power on the bones themselves, but also by injuries affecting either the cartilages that line, or unite them; or the ligaments which form and strengthen their union; or, lastly, the periosteum which covers them: for the affections of these parts which are essential to the bones, are often transmitted to them, and occasion the caries.

(*n*) I might alledge in support of this, the white colour, due consistence, and total inoffensiveness of smell, in the matter discharged from these abscesses at the time of their being opened. See the first part of my Essay on Counter-strokes, &c. already referred to in note (*b*).

(*o*) In saying this I have suppressed a fact which might have discovered me to be the author of this essay. For in the essay before referred to, may be found an instance of an ankylosis of the thigh with the os innominatum, after a caries. See page 590 of the fourth volume of the prizes of the Academy of Surgery ⁽²⁵⁾. I shall even observe here, that that patient experienced the last symptoms which brought him to the hospital, merely on account of a fresh fall on the part.

(*p*) I have at present under my care, a young man who has the joint of the ankle completely ankylosed, in consequence of a caries of the astragalus, the os calcis, and the articulating extremity of the tibia. This case promises a speedy cure, as there are now but a few fistulous orifices open, through which some few small exfoliations, still to be made, will pass.

(*q*) The

(*q*) The following are facts, supplied me by the practice of the hospital, since I sent this essay to the academy, and come very conclusively in support of the curative means, the efficacy of which I have established. Peter le Leu having fallen, on the 22d of December 1777, on his right knee, felt a sharp pain, but still took so little notice, that he continued his work the next day. Two days after, the pain increased so as to make it impossible for him to work; a considerable swelling, attended with much fever, came on, and an abscess was at last formed in the joint. A fluctuation, at a projecting point on the inside of the knee, became evident five weeks after the accident; and the pus collecting more and more, at length formed an external and very apparent tumour. The surgeon proposed opening it, but the patient not submitting, he was left to the care of nature alone. Towards the end of March, the matter made two openings for itself, from which there issued at first a matter without smell, and in very great quantity. But the pus soon changed its nature, becoming in a few days bloody and foetid, and the patient then found himself in a much worse state than before the vent of the matter, which had been encouraged by all kinds of maturing applications. Nevertheless, the patient, left totally to himself about this time, confining himself constantly to his bed, and avoiding all motion of the part to save himself from the pain that attended it, the discharge began to lose its foetid smell and to become less plentiful. The articulating surfaces of the thigh bone and the tibia were afterwards gradually folded together, so that when the patient came into the hospital on the 15th September, 1778, he had nothing more than a small fistulous opening at the upper and internal part of the leg, from which only a small quantity of pus was discharged, the good condition of which bespoke the speedy termination of this disease. It has ended in a complete ankylosis, with a projection of the tibia backwards, such as would be observed in a luxation of the bone towards that part, and which is probably as much owing to the destruction of the crucial ligaments at the time of the suppuration of the joint, as to the position the patient may have kept the part in during his long continuance in bed.

The following fact furnishes another instance in which nature seems to be preparing the same kind of termination. A soldier named Pecquigni, in the regiment of Touraine, having marched some days after he had received a wrench, has suffered all the accidents that can possibly follow so imprudent a step. A pain and inflammatory swelling came on, the suppuration of which being long delayed, it was resolved to remove him to another place. The tumour having at length suppurated and opened itself by five or six fistulous orifices, which, on being probed, evidently discovered a very extensive caries of the bones of the tarsus, and of the joint of the leg with the foot. The patient was sent back to the hospital at Rouen, where he came on the 14th of August. He had a slow suppuratory fever, which grew higher every night, and was attended with cough and a hoarseness. The foot and lower part of the leg were extremely swelled, and at the circumference of the tarsus and the joint, there were several fistulous openings which furnished a great quantity of ichorous, bloody, and very foetid pus. The state of stupidity in which I found the patient the next day and the day after, a colliquative fever, with a diarrhœa, an ash-coloured and emaciated countenance, made me consider amputation as a very uncertain method of preserving his life. This, joined to the aversion I have for these mutilations which are so often ineffectual, led me to entertain hopes, even in this case, critical as it was, of the effects of rest and infrequent dressings, which I had so effectually employed for three months in a caries of the wrist, which I shall mention hereafter. Accordingly I covered the fistulous openings with pledgits dipt in the commanders balsam ⁽²⁶⁾, and put over them large plaisters of diachylon, resolving to dress my patient only every five or six days, and putting the part between junks. Since five weeks that I have persisted in this method, the diarrhœa has stopped, the countenance and the pulse are infinitely mended, the discharge is thicker, less in quantity, and less foetid; the patient sleeps, and has recovered some appetite, so that we may already indulge in the hope of seeing this malady terminate by a salutary ankylosis.

(*r*) To this fact I can add another of the same nature, in which the mischiefs, though carried to a much higher degree than in the fore-mentioned observation, are evidently yielding to the method I have been describing.—Michael Davoux came into the hospital in May, 1778, with a compleat caries of the whole carpus, accompanied with three fistulous openings, communicating with each other on the inside and outside of the joint, the parts in the neighbourhood of the caries were œdematous, and swelled to so considerable a bulk, that most of the fingers measured more than five inches in circumference. If we add to these circumstances a slow colliquative fever, with a foetid and plentiful discharge, we shall have an idea of the disease. The amputation of the fore-arm seemed indeed the only resource of the art in this case; but before I determined on this operation, I was desirous at least of giving a trial to the methods that had succeeded so well to me in similar cases. Pledgits dipt in the commanders balsam, placed upon the fistulous openings, and confined by diachylon plaisters and compresses dipt in a balsamic embrocation, have been the only remedies used for this patient, since the time of his coming into the hospital, to the end of September. These have been assisted by intervals of ten, fifteen, and twenty days between each renewal of the dressings, and by maintaining the part in the most constant state of rest, by means of false junks. These means have brought this terrible disease into a state that enables us to prognosticate its cure; for at the time I am writing, all the fistulous orifices on the back part of the hand are closed; and of these, which answered to those on the inside, there now remains but one, which furnishes nothing but matter of a good consistence, and in small quantity. These circumstances, added to a very considerable diminution in the bulk of the parts affected, seem in fact to be the forerunners of an approaching cure.

(*/*) It is sufficiently known, that a whole limb may be put in motion, while the circumference of a wound or ulcer, upon some part of that limb, may be in a perfect state of rest. It is not therefore this sort of motion, that we mean to forbid here; it is that kind that should be exerted so as to bear upon the injured part itself, and so as to destroy in it, the
 arrange-

arrangement and adhesion of the nutritive particles nature has brought there for the formation of the scar.

(*t*) It is however to be presumed, that when fistulous openings extend underneath aponeuroses so strong and so tense, as the fascia lata, compressions can scarce ever be made, so powerful and so exact as to effect the proposed union throughout the whole extent of the sinus.

(*u*) If the fistulous opening be produced by a deep-seated caries, it will be readily conceived, that any compression which should re-unite the sinus, before the caries were cured, would prove both useless and pernicious.

(*w*) In the memoir referred to above, and which I had not quoted, lest I should have been discovered, it may be seen, how much I insist upon rest, as a mean of cure in most disorders that are the effect of counter-strokes in the joints, extension of the ligamentous parts, &c.

(*x*) The same memoir above quoted, in representing these different accidents as the natural consequence of counter-strokes in these parts, proves also, that rest is the method of cure chiefly pointed out in these cases. We may even conceive that the prescription of that, as well as of motion, is as much the province of the physician as of the surgeon; and that it would be rendering a very important service to the art of healing, to explain the indications which should lead us, either to prescribe or forbid the use of these two means, in diseases which are more properly belonging to medicine; for it must be acknowledged, they are too indiscriminately ordered in the cure of internal complaints. I have several facts by me which prove, that exercise, and pretty strong exertions of motion, have been very indiscreetly recommended in cases which, had they been properly distinguished, ought to have directed the exclusion of this kind of remedy, the effect of which could not but be, as it proved, very prejudicial; and I have other instances, in which rest has been prescribed from fallacious indications, which, if better understood, should have de-

terminated the employment of motion. But the conditions of this thesis, not allowing me to make any excursions foreign to my subject, I have only judged it right to mention this, as one of the most interesting questions that can be discussed.

(y) Every thing in nature is motion; it is the universal restorer and destroyer. Absolute rest, especially in animated beings, is an imaginary thing; for rest can only be relative, since it implies only a degree of motion reduced below a certain term of comparison.

NOTES

N O T E S

BY THE TRANSLATOR.

(1) **T**HE author has prefixed an advertisement to this essay, in which he mentions his reasons for publishing it himself. Though this detail is here omitted, as being in no wise essential to the point in question, or interesting to an English reader, yet I have judged it most proper to keep the performance in the form it was designed by the writer to appear.

(2) This supposes the nervous fluid, (if even there be such a thing existing) to be *fire*. I mean not to dispute *this* point with my friend. I would only observe, that this, as well as the rest of the introduction to this essay, is entirely conjectural. However ingenious it may appear to be, it cannot serve as the basis of those great truths, with which this valuable, though small performance, abounds, and which are founded on experience alone. This introduction therefore, might perhaps have been left out without any detriment to the subject. But as I hope it will be found entertaining, and full of new ideas, I should not have done justice

to my friend's public appearance in this country, had I altered his dress, or pared off any of its embroidery.

(3) The general opinion of anatomists is, that the Pons Varolii is formed, by the union of the peduncles of the brain, with those of the cerebellum. These peduncles seem evidently to be productions of the medullary substance of each of these parts.

(4) If the grayish or cineritious colour of the brain, be the distinguishing character of a secretory organ, it should seem, that the whole cortical substance of the brain should be the glandular part of it, or that part in which the fluid destined to be conveyed by the medullary substance is secreted. This, indeed, is generally supposed to be the case. Nature however seems to have placed the medullary substance more out of the reach of external injury, than the cineritious substance; for the former is deeper seated, and the latter, (from whence it is also called cortical,) is every where placed on the outside of the medullary substance, surrounding it on all sides, and seeming to protect it. Accordingly, in wounds of the brain, it is the cineritious substance which is first affected, and more of that is always necessarily destroyed than of the medullary substance. This last indeed has been considered, by all writers, as the most important part of the brain, and that chiefly from its more internal position. On the contrary, it may be urged in favour of our author's hypothesis, that the cortical substance of the brain, being only designed to secrete those fluids that are to put our loco-motive powers in action, it was not necessary that it should be so particular an object of nature's care. It should seem indeed, in general, that nature is more anxious to place the organ which conveys the secreted fluid, out of the way of danger, than that in which the secretion is performed. For the secretion may still be carried on in one part of that organ, though another part of it should be diseased, or even destroyed. The instances of this are so common, that it is unnecessary to mention them. But if the channel which conveys the fluid be cut off, and the fluid so secreted should be necessary to life, the communication between the secretory organ

gan and the vital principle, would be intercepted. If, for instance, one part of the intestinal canal, or some of the lacteal vessels, should be incapable of secreting and absorbing the chyle, this process may be carried on by the rest; but if the thoracic duct be injured, the animal must unavoidably perish, because no more nourishment can be conveyed into the machine*. Accordingly, the thoracic duct is placed with so much care, that it is almost impossible it should ever suffer from external injury. But this is all, as was before observed, the field of conjecture, in which, any man who wanders, must unavoidably lose himself.

(5) These tubercles seem to be entirely composed of the medullary substance of the brain. This does not appear to agree with our author's system.

(6) The lymphatic vessels, are not continuations of the arteries. They are a distinct set of vessels, whose origin is throughout the whole surface of the body, and from the surface of every cavity in it; and the termination of which is in the thoracic duct. They constitute the system of absorbents throughout the animal œconomy; and, as it appears from the late discoveries made concerning them, by anatomists who have been, and some of whom are happily still the light of the present age, their functions are as important, and as surprizing, as those of any other vessels in the body.

(7) We have a decisive proof of the possibility of nutrition without the aid of the thoracic duct, in the case related in Vol. LXX of the Philosophical Transactions, by Dr. CHESTON of GLOCESTER. In this instance the duct was rendered impervious by the accumulation of ossific matter within its cavity, so as to render the passage of any fluid from thence to the subclavian vein, a matter of absolute impossibility.

(8) As these two kinds of motion, described by our author, are very distinct, so do the effects they each of them produce, seem to be.

* In opposition to this opinion, see the case of an ossified and impervious thoracic duct, related in Vol. LXX of the Philosophical Transactions, by Dr. CHESTON. H.

The excess of intestine motion produces all those general diseases in the habit, which are the effect of any universally irritating cause whatsoever; such as inflammatory fevers, epileptic fits, universal spasm of all kinds, apoplexies, violent and sudden hæmorrhages, with many other disorders that fall chiefly under the province of the physician, and were therefore out of our author's discussion. A deficiency of intestine motion, on the contrary, produces all those complaints that are the effect of a general relaxation and debility, throughout the animal œconomy. Under this class may be ranged all putrid fevers, dropies, &c. There is another surgical disease which may likewise be referred to either or both of the above causes combined; I mean true or mixed aneurisms of the larger arteries, that are not the immediate effect of external injury. Although these complaints manifest themselves in some particular part, as in the thigh, leg, or arm, and therefore put on the appearance of local diseases, yet the fatal event that almost constantly follows any operation performed in these cases, seems to indicate a general disease of the whole arterial system. This may proceed either from the intestine motion of the heart and arteries being too strong for the resistance of the arterial coats, or from a want of intestine motion in the arterial coats themselves, which, preventing them from reacting properly on the fluid thrown into them by the force of the heart, occasions them to give way, and to swell out into aneurismal tumours; or, which is most probable, both those causes combined may produce this disease. However this may be, it is no less apparent, that this is some peculiar disease of the whole habit; for among the several instances of this kind that I have seen, I never saw one recover after amputation, which is generally the only operation that can be performed in these cases*. In one of them that was under my care at the Westminster Hospital, I had flattered myself with some hopes of success. It was a very large aneurism of the femoral artery, for which I was obliged to amputate the thigh, very near the groin, because the disease ran far up the limb. The wound, from the beginning of the suppuration,

* A case of popliteal aneurism, which was treated by amputation in the Gloucester Infirmary, proved successful. H.

appeared

appeared florid and well; the patient was in good health and spirits, and for more than three weeks, every appearance was as favourable as I could wish. This was a longer time than I had usually known patients to live after amputation in these cases; most of those I had seen, having expired within a fortnight. The stump was now nearly healed over, when, all on a sudden, a total languor came on, and a sphacelus of the stump, which carried off my patient in four-and-twenty hours after its first appearance. Must these deplorable cases then be left to themselves? or are the very rare instances of success, which some persons say they have seen in them, sufficient to justify us in running the immense risk we do in meddling with them? It must be owned, indeed, that these patients, if not relieved, will at length of themselves become victims to the disease; but, as we know not how long they might live under it with care and quiet, why should we venture to risk hastening the death of twenty persons, let us suppose, for the bare possibility of saving one? A dreadful alternative indeed! but let us hope that some method may hereafter be found out, to render the assistance of art less precarious in these cases. It may not be improper to add, as a farther proof of this disease being a general one of the whole habit, that in recent, and, as they usually are, spurious aneurisms of the arteries in the extremities, from bleeding or other external injury, the operation of tying up the artery as practised in these cases, is itself sometimes successful; and even when that fails, the subsequent amputation of the limb, which then becomes necessary, most commonly saves the life of the patient; but these are only local disorders, in which the rest of the arterial system is not in the least concerned*.

* The improvements suggested by Mr. Hunter in the treatment of aneurisms, were subsequent to the annotator's observations on the subject, as here set down. They afford proper matter for the reader's consideration, since the trials hitherto made, have, happily, tended to contradict the opinion, that the disease is a general one of the habit, and therefore not curable by any operation. Some valuable communications on this subject are to be found in the London Medical Journal; in the 7th volume of which, is a description of Mr. Hunter's operation, and an account of its success. H.

Such is the nature of the disorders proceeding from the excess or deficiency of intestine motion, or of that which is independent of the will, and essential to life. On the other hand, the excess of the loco-motive faculty, produces a great number of local diseases, such as external inflammation, abscesses, &c., and is one general cause of fractures, luxations, and sprains in the extremities; while the deficiency of it, occasions rigidities of all kinds in the limbs and joints, local obstructions, rheumatism, gout, &c. Thus we see, that disorders produced by the excess or deficiency of intestine motion, are general as their cause: those brought on by the same errors in the loco-motive faculty, are partial as their principle. I have considered fractures and luxations as being produced by excess of the loco-motive power, for it has always appeared to me, that most bones were broken by the strained action of the muscles upon them, rather than by the application of external force. In cases where the limb is quite passive at the time of receiving the accident, as where a coach or cart wheel passes over it, it is indeed evidently otherwise. But when the accident happens by some slip or sudden effort, the muscles, inserted in the bone, are then excited to their greatest power of action, in order that we may be kept, if possible, from falling. It is at this instant, I suppose, that the bone breaks. In fractures of the patella, this manifestly appears to be the case. This bone is so thick, and its texture so firm and compact, that any outward force applied that should be sufficient to break it, would infallibly shatter the joint, and, perhaps the whole limb, to pieces: for external force cannot be confined immediately to the spot on which it is exerted, but necessarily extends itself in proportion to the weight, velocity, and other advantages it may act with. We may conceive then, that fractures of the patella, always happen while the knee is bent, which it generally is, when the foot slips in any manner. The strong extensor muscles inserted into the patella, then exert all their power to bring the leg to the straight line, which would prevent the body from falling; but as they cannot overcome the sudden effort which determines the fall, all their force must necessarily be spent on the patella, which being then pressed across a fulcrum, formed in the state of genu-flexion, by the condyles of the thigh bone being pushed forward,

forward, must the more readily give way; and thus the knee pan is broken before the patient falls to the ground. That the cylindrical bones of the extremities may also be broken in this manner, is probable, from the great difference of fractures happening while the limb is in a passive, or in an active state. In the former case, there is generally a much greater comminution of the bones, the neighbouring parts are more injured, and the fractures for the most part are compound. In the latter case, or when the limb is broken by some sudden slip or effort, the mischief is frequently nothing more than a simple fracture of the bone. Both these causes, it is true, (to wit, a too strong exertion of muscular action, and a violent concussion from external force,) may concur in producing fractures, dislocations, and sprains. These must necessarily be of the worst kind; and accordingly we see, that in fractures from sudden leaps, in which the force of the muscles of the foot is exerted in its highest degree, and in which the part must also receive a very powerful external stroke, proportioned to the height and velocity of the fall, and to the nature of the bodies on which the foot may light; in these cases, I say, we generally find the ankle joint torn to pieces, and that a mortification, the consequence of this complicated injury, destroys the patient in a very short time, unless this fatal event be prevented by immediate amputation*.

These

* The following very remarkable accident happened to a traveller on the box of a stage coach. He was thrown on the ground with great violence, by the overturning of the carriage, and was soon afterwards taken to a neighbouring house, with his ankle in a very deformed state. Two gentlemen of the faculty, who were immediately called, finding a great degree of mischief done to that joint, and that, from a preternatural fullness of the posterior parts, some of the tarsal bones were displaced, took no small pains to restore to its proper situation, what was evidently much out of it. Their endeavours, however, were fruitless; so that after a considerable time spent in the attempt, (as well as at the desire of the patient himself,) they were obliged to desist. The joint was then poulticed, with a view to reduce the tension, which, by this time, was become very considerable. Three days afterwards, it appeared, that an extraneous body had been forced in, between the inferior part of the tibia, and the tendo Achillis. The violent pressure, which had been made use of to return this substance to its place, produced a mortification of the integuments, and these sloughing off in the course of a few days, afforded an opportunity of extracting, what was before suspected to be, a

These researches into the mode by which different accidents can be produced, may be thought more curious than useful; but it must be considered, that, in many surgical disorders, great stress is deservedly laid on the manner in which an injury happens, on the nature of the instrument it was made with, and even on the situation of the patient when he received it. In the present instance, these different accidents may suggest very different indications of cure. But this point cannot be discussed here, for I would not anticipate my friend in bringing forward observations, which are peculiar to him, and which will shortly come from himself*.

(9) A fat person might therefore subsist longer, with a less proportion of nourishment, than a lean one; for while there is any fat remaining in the cells of the cellular substance, it will necessarily be absorbed, for the nutrition of the animal.

(10) Vide Dr. CAVERHILL's treatise on the *gout*, relative to the cure of that disease by motion.

(11) The gentleman who is the subject of this remark, is my intimate friend. Just after this performance was printed, he had a pretty smart attack of the disease, in his foot. He attributed the return of this complaint, to his having again neglected his usual amusement of tennis, for two years past. When he was seized with this fit, which, from its first violence, seemed as if it would last some time, I advised him to rise constantly from his seat, notwithstanding it put him to great pain, and by degrees, to move his foot as much as possible. I also directed soft and dry friction, to be used frequently in the day. By these means, and by

portion of the astragalus, separated by the fracture of that bone. The patient, by proper care, afterwards recovered. An instance similar to this happened to a poor man's leg, owing to the falling in of a stone Quarry; by which accident it had been most terribly shattered, and a large fragment of the astragalus forced into the same situation with the above. H.

* This alludes to the Memoir on Counter-strokes, annexed to the present publication. H.

keeping him in a constant copious perspiration, the fit lasted no longer than three or four days. After it went off, he had a large boil formed on the upper and back part of the thigh, which suppurated very plentifully, and confined him for about a week longer.

(12) In support of this opinion, it may be added, that all persons subject to the rheumatism, are always more affected with the pain, in the morning, at their first rising, after they have remained for seven or eight hours in a complete state of rest. The pain is scarcely supportable at their first getting out of bed, but, with the exercise of the day, and gently using the part to motion, it always grows more tolerable. From this it should appear, that the advantage of warmth, however great it may be in this disease, cannot be comparable to that of motion; since the superior warmth of the bed and of a state of sleep, cannot compensate for the want of motion.

(13) Perhaps it is one of the greatest desiderata in surgery, to be able, either to assist nature in the formation of an ankylosis, or to form one artificially when nature does not seem to be disposed to it. Let me be permitted to observe here, that all the means which the ingenuity of surgeons has hitherto contrived, to effect this purpose, seem totally contrary to the method laid down, in the course of this essay, for bringing it about, by absolute rest and total inaction. It has been thought, indeed, that the exciting of inflammation, would be likely to procure adhesions between these solid parts. This reasoning has been founded on analogy, from considering the effects which inflammation frequently has on the fleshy parts. Injections, caustics, and setons passed through the joint, in cases of diseased articulations, have all been tried upon this principle. I must, indeed, confess, that I have tried them myself, and seen them often tried by others, without success. If the author's ideas of forming an ankylosis are just, as we may conclude they are from the facts he adduces hereafter in support of them, (some of which I have been witness to,) it will appear, that all the methods before proposed for this purpose, have rather impeded than forwarded it; so difficult is it to
know,

know, how to direct the operations of nature. If the method here proposed should hereafter prove generally successful, many limbs will probably be preserved, as will appear from that part of this essay which treats on the effects of rest in surgical disorders.

(14) The practice of using motion in fractures of the patella and olecranon, in order to prevent an anchylosis of the joint, which was almost always the consequence of the old method of treating these complaints, was first made use of, as I believe, by Mr. WATSON, *Surgeon to the Westminster Hospital*, though I know not that he has ever laid any claim to this very great improvement in the art of Surgery. So far I am certain, that I have seen him follow this practice above five and twenty years ago. Let me however be permitted to observe, that there is no necessity for waiting till the twenty fifth day, in order to begin moving the joint. Mr. Watson's method, in fractures of the patella, which I have always followed since I have been in practice, is to bring the fractured extremities as near as possible to each other, and to put on such a bandage as shall only allow of a very obscure degree of motion in the joint. But this obscure motion he permits his patients to exert on the third or fourth day after the accident, by directing them to rise out of bed, and walk gently about the room, with crutches, a little every day, till the union is sufficiently firm to allow them to bear on the ground. From following this method, I never saw the least inconvenience; but, on the contrary, the motion of the joint became perfectly free, after the consolidation of the fracture, even though there were a considerable interval between the fractured extremities. Let me be allowed to adduce a case, in confirmation of the utility of this practice. About two years ago, I attended the son of Sir Arch. Ed——, who had accidentally fractured the upper part of the olecranon; a case which does not occur near so often as the fracture of the patella, and that for obvious reasons. The fracture was attended with much swelling and contusion, which prevented me from discovering it till some days after the accident, though I suspected what had happened from the first. When the swelling and tension were removed, the bones, in this young habit, had already begun to shoot out
some

some callus, which prevented me from carrying the arm back to its full degree of extension. I brought it however, on the first time of applying the bandage, as near to a straight line as I could, and maintained it in that position, by supporting it close to the side of the body. In three days time, I took off the bandage, and found I could extend the arm much straighter than at first; I therefore gave the joint a very gentle degree of motion, for the space of a quarter of an hour, and then applied the bandage again. In this manner I proceeded every second or third day, renewing the bandage, and giving, each time, more and more motion to the joint, as the danger of displacing the fractured parts diminished. At length I succeeded in bringing the arm perfectly to the straight line, and when the young gentleman got well, which was in about six weeks after the application of the bandage, he had as free a motion and use of the joint as ever. I am apt to think the cure, in these cases, will be much more speedily performed, by adopting this method, than by waiting till the twenty-fifth day, before we begin moving the diseased joint.

(15) Spirituous liniments almost saturated with soap, and united to the active volatile alkaline spirit, have always succeeded best with me, in preventing or curing diseases of the joint. If camphor be united with them, it seems to make them infinitely more efficacious; for camphor, besides the great volatility of its particles, seems to possess a peculiar sedative quality, which renders it a very proper application in all inflammations, and in all cases where pain must be mitigated.—This method indeed, joined to fumigations, fomentations, and stupes, with vinegar, seems, as Dr. CHESTON has very well observed in his *PATHOLOGICAL OBSERVATIONS AND ENQUIRIES*, to be the most likely way to succeed in the cure of those dreadful disorders the knee joint is subject to, and which, when they are incipient, are termed white swellings. One circumstance may perhaps be added, which is, that friction itself, *gentle* friction I mean, may be as efficacious in bringing about the desired end, in these cases, as any of the other methods. This indeed is a circumstance very necessary to be attended to, for which reason, I always direct

rect the embrocations made use of, to be employed very freely, and the friction exerted with them to be continued for a long time, and very frequently renewed. It seems to be as necessary, in the practice of Surgery, to know for how long a time, and how frequently we should employ the means we may propose for the cure of any surgical complaints, under different circumstances, as it is in physic, to ascertain the proper doses of medicine, and their repetition, for the relief of internal disorders, in various constitutions. 'Tis much to be lamented, that both medicine and surgery are still very imperfect in this particular.

(16) In cases of rigidity also, most commonly remaining in the tendinous parts, after violent contusions or fractures, I cannot too much recommend the use of frictions, with oily, volatile, and saponaceous applications, and a steady perseverance in the use of them. I have frequently seen fractures and contusions about the wrist, which, after a long time, have left the flexor tendons of the fingers, in particular on the inside of the fore arm, in a state of considerable swelling, pain, and stiffness, insomuch, that after all the bones were firmly and evenly consolidated, there has appeared as great a degree of deformity as if a luxation or fracture subsisted still*. The embrocations before mentioned, are usually

* This deformity of the wrist does not seem to be properly understood. It is much more frequently met with, among people advancing in years, (particularly women) after falls, than in the earlier part of life, and seems to me to arise from a rupture of the ligaments, which, in a natural state, preserve the symmetry of this joint. Hence the radius drops inwards, while the carpal bones seem to be thrown outwards. Whoever has seen the true dislocation of this joint, which however is always to be reduced with the greatest ease, will readily distinguish the two cases. From repeated experience I have found, that the best method to prevent this deformity is, after making a moderate extension, and bending the hand inwards, so as to relax the palmaris muscle, &c., to pass a bandage, pretty tight, round the lower part of the arm and wrist, and then over the back of the hand, so as to put the latter into a declining state; by this means the radius, which causes the greatest part of the deformity, is raised to its proper place. If, afterwards, a splint of some strength be applied on the back of the arm, and extended about two inches over the joint of the wrist, it will serve as a fulcrum, by being inclosed in another roller, to keep the parts in a proper situation. It is frequently proper to include a compress, in this latter bandage, on the projecting part

usually ordered, to relieve these troublesome and disagreeable complaints, but I think, sufficient stress is not at the same time laid upon the free use of these liniments, and the long continuance, as well as frequent repetition, of the friction that is to be used with them. This I believe to be the reason why these complaints generally last so long, and are sometimes never removed. The patient, wearied out with the inefficacy of means, which seem to fail merely from being improperly used, grows importunate with the surgeon, to try something else. The surgeon, unwilling to see his art baffled, and not perhaps attending to the true reason of it, frequently changes his best methods for others infinitely less likely to succeed; but to which, report, and the experience of others, seem to have given a sanction. The officiousness of idle people, who are continually talking of the numberless fine cures they have seen effected by goose grease, steeping in bullocks' paunches, and other such methods, often induce patients to try them, in preference to a better method, ordered by a skilful surgeon, which, had they persevered in, or used it properly, would, in all probability, have had the desired effect. Time alone sometimes gradually brings about the recovery of the parts.

(17) ROTROU'S SOLVENT—The composition of ROTROU'S *solvent* is given as follows: "Crude antimony, mixed with three parts of nitre, and exposed to the fire in a crucible, loses all its phlogiston by the action of the nitre. The mixture enters into a paste like fusion, it is then poured on a marble, pulverised, and kept in a bottle." *Baumé's Manual of Chemistry*, p. 206*.

(18) Burnt

part of the radius, taking care, however, that it shall not press on the radial artery. The back of the hand, and the arm, above the bandage, in general, swell pretty much; but, to prevent inflammation, the bandage should be constantly moistened with Goulard water or some other topic. It should farther have been observed, that the radius is frequently fractured in this case, but not always in the same place. H.

* In the account of ROTROU'S *Medicines* given by ASTRUC, at the end of his fourth book, is the following combination of nitre and antimony, under the name of PULVIS LIQUANS:

H h

R Regulæ

(18) Burnt sponge is one of the remedies that seem to act in this manner, in the cure of this disease. If persevered in for a long time, and used very freely, I am inclined to think it one of the most useful alkaline and absorbent medicines against this complaint, and also against the bronchocele, in which latter instance, I have sometimes used it with success. But to do any good in these last cases, it must be used much more freely than it generally is. I have had patients who have taken more than an ounce of it every day.

(19) I find, in LIEUTAUD'S *Synopsis*, and WECKER'S *Antidotarium Speciale*, the following plasters of VIGO.

EMPLASTRUM DE RANIS, vel DE VIGO, *cum mercurio*, maxima rerum copia exurgit. Primo, coquuntur in vino & aceto ranæ & lumbrici, cum radicibus ebuli & enulæ, floribus chamæmeli, lavandulæ, &c. Dein seorsim liquantur cera & axungia, styrax & terebinthina, cum oleis ranarum, lumbricorum, liliorum, &c. Quibus fufis adduntur olibanum myrrha, euphorbium & crocus, cum oleo essentiali lavandulæ. Tum decocto & liquamini, simul mixtis, & ulterius coctis, adjicitur mercurius ope terebinthinæ & styracis extinctus ; ut ex omnibus notissimâ arte subactis emergat emplastrum, quod inter eximia resolventia & incidentia haud immerito decantatur. Ideo conducit in tumoribus cysticis & anomalis ; gummata venerea evincit ; glandulis scrophulosis opitulatur, &c. Postremo nonnunquam adhibetur amplitudine congruâ, ad movendam salivationem, vel oppugnandum virus venereum adhibetur, atque in hunc finem paratur cum duplicato vel quadruplicato mercurio, ut ad hoc opus efficacius evadat. LIEUTAUD, p. 897.

R. *Reguli antimonii optime preparati et in pulverem triti.*

Nitri purificati et in pulverem seorsim reducti ana libiss.

These two powders being mixed, throw a spoonful at a time into a red hot crucible, and let the whole calcine for six hours. This is afterwards to be pulverized and kept in a glass vessel. To complete the process, we are directed to add to each pound of the powder, warmed over the fire, six ounces of strong cinnamon water, drop by drop, stirring it continually till the whole is evaporated. H.

DIACHYLON

DIACHYLON CUM GUMMI VIGONIS.—℞ Rad. Althæ. ℔ss—Semin. Lini Fœnigræci ana ʒj, Violarum—Sem. Malvæ—Sem. Althæ—Sem. Cydoniorum ana, ʒss—Sem. Pŷyllii ʒij—Rad. Ireos ʒij—Olei Chamæmelini—Olei Anethini—Olei Liliorum—Olei Lini—Olei Irini ana ʒiij—Pingued. Gallinæ—Pingued. Anatis—Pingued. Anferis ana ʒiij—Olei Amygd. dulc.—Oefyp̃i humidi—Succi Glycerrhizæ ana ʒx—Terebinthinæ ʒiss—Sevi vituli ℔ss—Lithargyri auri ʒx—Bulliant omnia simul baculo agitando, usque ad consumptionem mucilaginis. Deinde cum cera alba, quantum sufficit, fiat ceratum molle addendo Sagapeni—Opoponaci—Bdellii mollis—Galbani ana ʒiij—Hammoniacy ʒv dissoluta in aceto, fiat Emplastrum.

EMPLASTRUM DE MINIO VIGONIS.—℞ Olei rosati adorati ℔ss—Olei Myrtini—Unguenti Populeonis ana ʒiv—Pinguedinis Gallinæ ʒii—Sevi Castrati—Sevi vaccini ana ℔ss—Pingued. Porcinæ ʒvij—Lithargiri auri—Lythargiri argenti ana ʒiiiss—Minii ʒiij—Cerussæ ʒiv—Terebinthinæ ʒx Cerae q. s. Fiat emplastrum secundum artem, tendens ad nigredinem. WECKER, *Antid. Spec.* Lib. II.

EMPLASTRUM DIABOTANUM.—Forte plus æquo celebratum, nomen fortitur ab ingenti plantarum copiâ, quæ ejus compositionem ingrediuntur; inter quas notandæ veniunt; cicuta, valeriana, chamæpithis, angelica, raphanus rusticanus, cucumis, schrophularia; chelidonium, gratiola, &c. quorum decoctum, addito nonnullarum succo, evaporationi committitur; ut adjiciatur gummi ammoniaci, galbani &c. in aceto scilicito solutio. Dein admiscantur lythargyrus; olea lumbricorum, catellorum, &c. in aqua cocta. Quæ omnia mixta postea recipiunt sulphur, ceram, styracem & picem; non secus ac pulverem radicum ireos, cyclaminis, serpentariæ, hellebori, ari, aristolochiæ, &c. baccarum lauri & nonnullorum seminum; varia gummata, camphoram, oleum caryophyllorum, &c. Quid emergat e tanta rerum farragine vix definiri potest. Huicce tamen emplastro insulæ compositionis, tribuuntur vires resolventes, emollientes & demulcentes; nec refragatur experientia: præcipuè deprecatur adversus tumores cysticos, glandulas induratas, ganglia, &c. LIEUTAUD, p. 810.

(20) In scrophulous ulcers attended with caries, I have used, with good success, a small portion of the magnes arsenicalis, which I have applied to the foul ulcers and carious bones. The idea of using this medicine in scrophulous ulcers, was suggested to me, from a surgical manuscript I found at the British Museum, which advised it, as a specific in those cases. But though apparently a very useful application, and indeed more so than any other topic I have ever tried, yet I cannot take upon me to say, that it deserves this appellation. There were also some other curious matters I extracted from manuscripts in that collection, and of which a full account has appeared, in the work which I have published, on the treatment of cancerous diseases.

(21) I knew not, till I read this pamphlet, that volatile alkalis had been proposed by Mr. Perilhe in the cure of this disease; but, for some years past, it has been my constant practice, both in private, and at the Westminster Hospital to give strong volatile medicines in the cure of the venereal disease. The volatile I used formerly to prescribe, was the volatile tincture of guaiacum; and this I did with a view to assist the action of mercury; for I have always held, that in order to render mercury more efficacious in the cure of the venereal disease, it was necessary to excite the powers of it by warm and stimulating medicines. By this combination, I have succeeded in curing several venereal complaints, which subsisted after the patients had been salivated, and had persevered in a course of mercurial medicines for a very considerable length of time, I consider salivation, indeed, merely as an overdose of mercury, and cannot think it contributes the least, in itself, to the expulsion of the virus. But these, and several other observations, which reading and a careful practice has supplied me with, on the venereal disease, would lead me too far here. I shall only hint at one particular case, of a terrible venereal cancer, that had eaten away the greater part of the penis, and the cure of which seemed to prove, that the cancerous ulcer, sometimes succeeding to this disease, requires a different treatment from the venereal virus itself; and that, although the cancer should be cured, the virus still remains in the body. The patient I allude to, had taken

a prodigious quantity of mercury before I saw him. He had had many universal symptoms of the disease, which had all yielded to this treatment; and there remained only, when he applied to me, this terrible cancerous ulcer before mentioned, which had already eaten away one half of the penis, and was spreading very fast on the prepuce towards the integuments of the abdomen. With great difficulty, I succeeded in putting a stop to this cancer, without a grain of mercury, by methods which I shall give a full account of on another occasion. To my great surprize, however, no sooner was the cancer healed, than my patient was seized with venereal symptoms all over the body, viz. ulcers in the throat, universal pains, swelled legs, and nodes upon the bones. All these, however, yielded readily to a prudent administration of mercury, joined to active volatile stimulating medicines and the warm bath; and the patient, at this day, three years from the time of his being under my care, enjoys a perfect state of health.

(22) The best instrument ever invented for these cases, is that published in the Memoirs of the Academy of Surgery, under the name of Mr. VACHER, and it seems to act entirely upon these principles; for, by keeping the spine, as much as possible, in one continued state of extension, it not only prevents the vertebræ from pressing upon each other, but likewise hinders them from moving one upon the other, and consequently in some measure maintains them in a state of rest.

(23) It is needless to expatiate upon the novelty and excellence of all these observations respecting abscesses proceeding from carious vertebræ of the back or loins, or, in other words, of what we familiarly call *psoas cases*, which destroy so many patients at all periods of life. But these call to my remembrance a remarkable case, which fell under my care in the *Westminster Hospital*, and the event of which I could never satisfactorily account for. This case is related at large in my *Essay on Abscesses*, page 128.

(24) From

(24) From this observation of the possibility of a limb being in motion, while the circumference of an ulcer or sore in it, may be at rest, we may account for the utility of bandage, in the cure of ulcers of the legs. Proper bandage answers the very purpose of keeping the ulcer, and the parts about it, steady and at rest, notwithstanding the motion that may be given to the limb. But we must observe, that an upright posture, by forcing the lower extremities to support the whole weight of the trunk, counteracts the good effects of bandage; so that whatever lateral motions of the limb we may allow our patients, in ulcers of the lower extremities, we must take great care to confine them to a horizontal posture. It is evident this cannot extend to sores in the upper extremities, for the weight of the body not pressing upon them in an upright posture, the rest of the part is only to be attended to in these cases.

(25) The reader will find in the annexed *Memoir on Counter-Stroke*, all the different cases to which the author alludes.

(26) BALSAMUM COMMENDATORIS, *Beaume du Chevalier*, vel, a nonnullis, *Beaume universel*, est tinctura spirituosæ radicis angelicæ & florum hyperici; in qua peracta digeruntur primò myrrha & olibanum; dein styrax, benzoinum, balsamum tolutanum, aloë & ambra cineritia. Crebrius in usum venit illud balsamum; ac pro exquisitiore stomachico & carminante habetur; roborantium, & præsertim cephalicorum classem subit. Idcirco confert in cardialgiâ; dolores a flatulentia compescit; somnolentiam arcet; diuresim movet, &c. Dosis a guttis quatuor, ad viginti, in jasculo, vino, syrupo, aliove haustu. Insuper eximium vulnerarium & anteputridum externum censetur; nec infimum locum tenet inter resolventia: ideò faustè admovetur vulneribus recentibus, contusioni & gangrænæ: nec minus auxiliatur partibus paralyticis. LIEUTAUD, p. 673.

IV.

ON THE

E F F E C T S

OF

C O U N T E R - S T R O K E S.

IV

W. E. C. S.

COUNTY OF KENT

AN ESSAY

ON THE FOLLOWING

PROPOSITION.

TO EXPLAIN THE EFFECTS OF COUNTER-STROKES
ON THE SEVERAL PARTS OF THE BODY, EXCLUSIVE
OF THE HEAD, AND THE METHODS OF RELIEVING
THEM.

A THEME so interesting, could only be proposed by the ACADEMY OF SURGERY: and it required the sagacity of that celebrated body, to perceive, in the discussion of a question, which to ordinary surgeons may possibly appear barren of matter, a series of facts and practical inferences, well calculated to extend the boundaries of an art, the improvement of which is their sole object, and the rational exercise of which, tends greatly to relieve the sufferings of mankind. Powerful motives these, to excite emulation among competitors for a prize, to be awarded by the hand of Science!

To ask an explanation of the effects of counter-strokes on the several parts of the body, exclusive of the head, is to beg the question concerning the existence of these counter-strokes, and of the mischiefs that ensue from them. To demand an exposition of the means of relieving them, is to require of those who may attempt to solve this important question, a methodical and considerate application of the means which the art may suggest to a man of knowledge, who, in the effects of counter-strokes, perceives at once, both the connection between the cause and the effect, and the mechanism by which the injuries he sees have been produced.

If it be a matter of surprize, that the existence of counter-strokes in the head, should have appeared problematical, even at a time when supported by reason and experience, it is still infinitely more astonishing, that the efforts of counter-strokes on other parts should have been in some sort overlooked, and that no writer should refer, at least explicitly, to this kind of cause, numbers of accidents which he must have seen (^a). Although it must be acknowledged, that practice is not so much affected by this omission, as might be imagined, on account of the number of cases in which a knowledge of the mechanism by which the accident was occasioned, could have little influence on the mode of cure to be pursued, yet there are cases in which a knowledge of this mechanism can only suggest, with propriety, the curative means to be employed. This is sufficient to render a solution of the proposed question very interesting, although it should not even convey to the mind that degree of satisfaction, which we always experience, when we are convinced of having discovered the immediate relation of the cause to the effect.

Counter-strokes, in the several parts of the body, exclusive of the head, are so frequent, that diseases of the utmost importance in surgery, may be considered as being produced by them. I shall endeavour to prove this proposition by facts, rather than by argument. Besides those which I have collected from the experience of some great masters in the art, whom I have attended, there are no inconsiderable number which have occurred in my own practice, and which all contribute in the most palpable manner

ner to evince the pernicious effects of these counter-strokes. If therefore, I can only give a rational analysis of these facts, accompanied with a mode of cure, adapted to the nature of these accidents and their cause, I flatter myself that I shall answer the two requisites of the proposition ; but, sensible as I am of the difficulty of the undertaking, of my own insufficiency, and of the discernment of those who are to decide upon the subject, I am excited to engage in the attempt, rather by a desire of shewing my zeal for the improvement of the art, than by any hope of success in the enterprize.

A counter-stroke, taken in the most extensive sense, is a shock, which, from the part immediately stricken, is transmitted to a greater or less distance, and which produces, in its progression, mischiefs more or less evident ; while the part which first received the shock, often remains uninjured.

In a more confined sense, as we generally consider it in the first instance, a counter-stroke is a shock which is conveyed from the part immediately stricken, to other parts, and produces in them the same mischiefs, which the body giving the shock would have occasioned, if these parts had been immediately exposed to its action ^(b).

When we are once acquainted with the laws, according to which, motion communicates itself and is lost, and with the circumstances necessary to occasion a congeries of solid fibres, to yield more easily in one place than in another, we may form a sufficiently exact theory of the effects of counter-strokes on the hard parts. Several facts will afford me the opportunity of elucidating the mechanism of these counter-strokes ; which will be better understood, when it shall only be an explanation of the manner in which such and such mischief may have been produced, in a part distant from that which has received the first shock. Thus, after having pointed out the effects of counter-strokes on the different parts of the body, exclusive of the head, I shall speak of the proper mode of treating them, according to the nature of the mischief

which may have been occasioned ; and that I may proceed with order, this essay shall be divided into two parts.

In the first, I shall explain the effects of counter-strokes on the several external parts subject to the action of this cause, and shall point out a method of cure adapted to the cause, to its effects, and to the accidents which are, or may be, the consequence of it.

In the second part, I shall treat of the effects of counter-strokes upon several of the viscera contained in the cavities of the human body, beside that of the cranium ; and shall indicate the mode of treatment that may be used, with the greatest probability of success, against the injuries that are occasioned by them.

PART

P A R T I.

IT is evident from facts, that the principal pieces which enter into the composition of the trunk, and of the extremities of the human body, are subject to the effects of counter-strokes. Those especially which constitute the lower extremities, are the most liable to them, for which reason, we are naturally led to begin with examining the mischiefs that may be produced in them by such a cause, and the mode of relieving them. But before we proceed to this part of the question, it may be proper to notice some preliminary facts, calculated to explain, almost intuitively, the mechanism of counter-strokes, and the connection between their effects and the cause that produced them. Any part of the machine may sustain a shock, whether a body put in motion shall strike against the part, or whether the part itself shall strike, with a certain velocity, against a body at rest. This being premised, let us observe,

1st. That the feet, at every step of progressive motion, receive shocks which are conveyed, without any sensible effects, along the inferior extremities, the spine, &c.

2dly. That these small shocks, which are nothing in the instance of habit we have been mentioning, are more sensibly felt in leaps, and may be

be attended with many mischiefs in passing through the parts to which the shock is conveyed.

3dly. That in falls on the feet, it often happens, that the shock is sufficient to produce accidents, which require the assistance of art; but in this respect, the accident is always in proportion to the height of the fall, and to the state of the parts which receive the motion, as we shall make it appear in a future discussion.

Man is destined to walk upright, to run, to leap; and is therefore exposed to all the bad effects that may result from the kind of shock we have been speaking of. Accordingly, we cannot behold, without admiration, the precautions which nature has employed, in the manner by which the pieces that compose the lower extremities and the trunk, are articulated with each other, in order to prevent the invincible resistance which the feet meet with on the ground, from producing (at least in ordinary instances) any mischief in the bony parts constituting either these extremities or the trunk; and also in order that the important viscus contained in the cavity of the cranium should be preserved from any shock sufficient to disturb its organization. A cursory review of these objects will enable us the better to understand all the contrivances of nature to elude the effects of counter-strokes that may be transmitted through this channel.

The bones of the tarsus and metatarsus, are formed and articulated in such a manner, as to leave a hollow of a certain depth in the sole of the foot; a cavity from which nature derives other advantages beside that of making a passage for tendons, blood-vessels, and nerves; for this hollow forms a kind of arch, the parts of which being moveable upon each other, may give way a little in yielding to the motion of the upper parts that press upon them; the motion, therefore of these parts being in some measure destroyed here, they retain the less of it.

The

The cartilages with which the articulating surfaces of the bones of the foot and leg are covered, destroy also a part of this motion, so that it is much weakened when sent away from thence, or when we consider it at the articulation of the leg with the thigh; where the cartilages covering the extremities of these bones, and the intermediate femilunar cartilages, evidently concur in the same effect. Hence it may be concluded, that the motion communicated to the upper parts resting upon the thigh, hath already lost much of its force, when we consider it in the articulation of the thigh with the os innominatum, where we meet with fresh cartilages, which absorb still more of the motion. But the circumstance which absorbs the most of it in this place, is the obliquity with which the head of the thigh bone bears upon its neck; for by means of this disposition, the two ossa innominata, by the quantity of motion still remaining in the upper parts, press upon each other forwards at the symphysis of the pubis, and laterally upon the os sacrum, at the point of their articulation with this bone. Now, we know, that at these points of union, there are some very thick cartilages; and by tracing the motion along the spinal column, we observe with what art nature hath articulated and arranged the pieces which compose it, to diminish the violence of this motion; so that we are no longer surprized, that the motion of so large a mass as the human body, accelerated even during the time of a fall from a considerable height, should be reduced almost to nothing, when transmitted to the brain, by the resistance which the feet have met with.

We are not to suppose, however, that the cartilages of the joints, the ligaments that surround them, and the motion of the bones over each other, are the only circumstances that concur in this matter; the muscles have also their share in destroying the motion of the upper parts over the lower ones, striking against the ground: for notwithstanding the admirable arrangement of the pieces that compose the spine, the brain would receive, in the most common leaps, a commotion sufficient to disturb its organization, if, at the instant of the shock, the motion were conveyed in such a direction, as that the trunk and extremities should be in a straight line; but fortunately this is a circumstance
which

which cannot often happen. The lower end of the thigh bone, is generally forced to make an angle, more or less obtuse, with the tibia, according to the violence of the fall; which angle would even become so far acute, as that the buttocks would come to the ground, unless the muscles, known by the name of extensors of the leg, exerted themselves to oppose this, or rather, unless they gave way only by degrees, and to a certain point^(c).

This first flexion necessarily brings on another, that of the trunk forwards on the thigh; a flexion which is moderated by all the muscles fixed in the tuberosity of the ischium, otherwise the head would strike against the knees.

It is sufficiently evident from what has been said, that in all instances of leaps or falls upon the feet, the spinal column must be bent forwards, and that the head then tends to fall downwards and forwards, by describing a curve; but the muscles which serve to extend the head, the back, and the neck, are at this instant thrown forcibly into action, and retain the trunk and head in such a manner, that the motion remaining in them can only (except in falls from a very great height) bend the head and trunk forwards to a certain degree; from whence it is evident, that in cases of leaps or falls upon the feet, most of the muscles of the human body are employed in destroying the greatest part of the motion, by allowing the bones to which they are attached, to yield only by degrees, and successively, to the impulse, or action of the weight.

Notwithstanding this admirable arrangement, nature is still frequently in default. The direction of the shock, though a moderate one, is sometimes such as to elude the action of most of the agents which have been prudently employed to lessen it; or else the motion is too violent to allow these agents to absorb a sufficient quantity of it to prevent mischief in some of the part through which it is transmitted. This fatal truth is

but too well evinced by numbers of facts ; but as, in the instances above mentioned, the lower extremities are the parts that receive the first shock, which is conveyed by them to the trunk, we shall first examine the effects of counter-strokes on the several pieces which compose them. We shall then trace the effects of a similar cause upon the bones which concur in forming the trunk ; and lastly, we shall explain the mischiefs that may be produced from counter-strokes on the several parts that constitute the upper extremities. In treating each of these points separately, we shall point out the method of cure adapted to the nature of the mischief produced by the counter-stroke, and to the accidental circumstances attending it. This mode of proceeding presents us with a very natural division of the first part of our essay.

S E C T I O N I.

TO EXPLAIN THE EFFECTS OF COUNTER-STROKES
ON THE SEVERAL PIECES CONSTITUTING THE LOWER
EXTREMITIES, AND THE MODE OF CURE ADAPTED
TO THEM.

FALLS upon the feet, and leaps, being the most ordinary causes of the violent counter-strokes which the lower extremities sometimes suffer, it is natural that the effects which this cause may produce upon the parts most contiguous to those which receive the shock, should first engage our attention ; such as those which concur in the formation of the ancle joint.

The manner in which the lower extremities of the bones of the leg are articulated laterally with the astragalus, the extent of surface which this bone presents to the articulating cavity which receives its upper part, the motion of the other bones of the tarsus with which it is articulated, the great number of ligaments which unite these bones to each other, every circumstance shews us, on the part of nature, a multiplicity of contrivances employed to elude, in the best manner, the effects of counter-strokes in the articulation of the leg with the tarsus ; insomuch, that although, in leaps or falls upon the feet, it be the joint nearest to the
part

part receiving the shock, it seldom suffers any injury from it, this joint hath sometimes, however, experienced mischiefs originating from such a cause.

A young man, in leaping from about eight feet high, having rested much more on the left, than on the right foot, felt, at the instant, a pain, which though not violent, was succeeded by a numbness, and a little difficulty in motion. The vivacity of youth made him pay little attention to these symptoms which were at first slight; but the pain, as well as the difficulty of motion afterwards increasing, and the foot being much swelled about the joint, he applied to a surgeon, though not till about two months after the accident. Every mode of relief supposed to be best adapted to the case was tried in vain for four months; the mischief increased. Several abscesses were formed in the vicinity of the joint, which being opened, were found to communicate with the inside of the articular cavity, into which the probe might be easily passed. The remedies most proper for the patient in his present state, having been tried without effect, and the fever increasing, it was resolved to amputate his leg. Upon examining the joint, I found the astragalus, and the articulating surfaces of the bones of the leg, affected with caries.

A few bleedings in the first instance, above all things rest, and the application of resolute spirituous topics to the part, would certainly have prevented those symptoms which led to the amputation of the limb; these are the means at least, which I have always employed, with the greatest success, in similar cases. It must, however, be acknowledged, that spirituous resolute topics are not always proper. They should be laid aside whenever the pain is considerable, and cataplasms made of the pulp of emollient plants should be substituted for them; and when the pain is assuaged, embrocations with the saturnine soap may be used, or compresses dipt in water quickened with sea salt, and with salt ammoniac, to which a little brandy being added, may be applied to the part. It is very unfrequent in leaps or falls on the feet, attended with bad symptoms, that the foot should have borne perpendicularly enough on the ground, to occasion these symptoms always to arise from the effects of counter-

counter-strokes in the joint: if the foot be twisted ever so little to one side, there will be, an extension of the ligaments on the opposite side; there will be, what is called a wrench, and this accident can at most only be reckoned an effect of the counter-stroke taken in its most extensive sense: the curative indications are, however, the same as those which have been just mentioned.

I shall only observe, that whenever, notwithstanding the use of these means, there shall remain, after the shock in the joint with extension and bruise of the ligaments, a permanent stiffness and swelling of the surrounding parts, oily and mucilaginous liniments, such as those of the unguentum althææ, animated however with a small quantity of brandy, may be tried with effect; or liniments made with the marrow of animals, quickened also with the addition of some spirituous topic. The part may likewise be bathed in tripe liquor, or in warm animal blood; and if all these remedies should prove insufficient to restore the joint to its suppleness, and to dissipate the swelling of the ligamentous and tendinous parts that surround it, no delay must be used in pumping artificially upon the part with hot water animated with sea salt and salt ammoniac; or in sending the patient to the waters of Aix-la-chappelle, Bourbon, Bourbonne, or any other of the same kind. In cases of relaxation of the ligaments, and habitual pain in the parts about the joint, with a partial anchylosis, complaints which are also often the consequence of counter-strokes, I have likewise used the following remedy with much success. Let the joint be surrounded with a bag full of plaister of Paris in powder, to which a fourth part of sea salt and of salt ammoniac must be added, taking care to heat the bag before its application, which must be frequently renewed. I have also employed with effect, a cataplasm made with the pulp of the roots of the consolida major, mixt up with honey, in equal parts, and spread upon tow. What is here prescribed for the ankle joint, is equally proper for the other parts of the body, whenever the effects of counter-strokes shall leave symptoms behind them which may require the use of such means. I shall therefore avoid repeating them, and shall only hereafter indicate those remedies that are the best calculated to relieve the urgent symptoms,

symptoms, taking it for granted, that the cases, in which the application of any of the different topics here proposed may be of advantage, will not be overlooked.

The counter-stroke in the ankle joint, may also give rise to a fracture of the fibula, the lower extremity of which, being forced a little to one side in an oblique fall on the feet, resists, while the weaker part of the bone gives way and is fractured, without however occasioning a luxation of the foot sideways. I have met with more than one instance of such fractures; for which reason, in all accidents of a fall upon the feet from any height, or even of a wrench, we must always examine whether the injury we perceive about the joint, be not complicated with a fracture of the fibula. It is rather difficult to discover this accident, when the lower part of the leg has begun to swell; the turning of the sole of the foot a little inwards, may be the effect of the extension of the ligaments, or of a diastasis, and not be an indication of the fracture of the fibula, which we must endeavour to find out by some more certain signs. The best way of doing this, is to grasp the lower part of the leg with one hand, while, with the other, we move the tarsus to each side; and with a little patience and habit, we shall distinguish the crepitation of the bone, which is the pathognomic sign of the fracture. The following fact will shew how necessary it is to make this discovery. A mason, having made a false step, felt an acute pain about the external ankle, which he thought to be merely the consequence of a slight sprain, and paid no great attention to it; he even continued to work, notwithstanding the swelling which came on the part, and the increase of the pain, which however became at length so violent, that he was forced to give over work on the third day after the accident; but not having recourse to any surgical assistance, he abstained only partially from motion, and applied, merely according to his own ideas, different poultices upon the part. At length being obliged to come to the hospital, he met with every assistance which his case required; but it was no longer time to think of discovering the fracture, the swelling was considerable, and already announced a suppuration formed about the joint, which soon manifested itself on the application of remedies proper

per to forward it. The abscess was properly opened, and the surgeon, examining with his finger the bottom of it, found that the external angle was broken off. Notwithstanding the good constitution of the patient, the free openings that were made, and the careful use of all the means that were the best calculated for his relief, yet he went through a series of accidents, which obliged him, about two months after, to submit to the amputation of his leg, as the only way to save his life.

But let us suppose that we should be called in time, and that the fracture of the fibula should be discovered, the treatment proper for such an accident is too well known for me to dwell upon it here. Let me only be allowed to observe, that in the first instance, we must carefully avoid applying a circular bandage on the fractured part. It is, indeed, evident that such a mode of proceeding tends only to push the fractured parts of the fibula inwards against the tibia, which is by no means the intention we should have in view: on the contrary, we must endeavour to keep them in apposition to each other, by preserving the natural distance between the two bones; and in order to effect this, we must first place, both on the outside and on the inside, on the spot that answers to the interosseous space, a slip of linen of a certain thickness, or a narrow splint well covered, in order that the circular bandage to be applied immediately over, may press a sufficient quantity of flesh between the tibia and fibula, to keep the fractured parts of the latter in exact apposition, and at a proper distance from the tibia. This mode of binding up the limb, answers nearly the same purpose, as if the circular bandage were put round the single bone fractured, which cannot be done. It is from having been witness, both to the accidents which have sometimes succeeded the immediate application of the circular rollers in fractures of the fibula^(d), and to the good effects of splints first applied, that I insist upon this precaution, which is also indicated in compound fractures of the leg, which are themselves often the result of counter-strokes.

A man carrying a load, upon a sloping ground, made a hasty step, or rather a kind of spring, in which the whole weight of his body bore almost

almost entirely upon the right leg; the motion, losing itself in the ankle-joint, produced no apparent mischief there; but the tibia, the fibres of which are naturally rather arched forwards, gave way, and was broken just below its middle. The upper end of the fractured bone pierced the integuments, and pursuing the oblique direction of its motion, fixed itself in the ground.

This was a kind of counter-stroke, the mechanism of which is very evident, and for which it is easy to point out the means of cure; they are the same as those that are proper for every compound fracture of the leg, though arising from another cause. Accordingly, without considering the mechanism or cause of the fracture, I only attended to the circumstance of reducing it properly; this was done very exactly, after having previously set the integuments free, which were much upon the stretch. After this, the eighteen-tailed bandage was applied according to the rules of art; the patient was blooded, and restrained to a proper diet. At the usual period the suppuration came on, which from the fourth to the eleventh day, was plentiful. The portion of the tibia that was bare, had no unfavourable aspect; the patient's pulse and countenance were good; notwithstanding which he began to experience some shiverings; on the eleventh day he grew delirious; and on the twelfth, he had some convulsive motions in the lower jaw; a fever came on; a change took place in the limb; the symptoms were all aggravated, and he died on the fourteenth day from his accident (c).

A student of sixteen years of age, in leaping a ditch, fractured his leg by the same mechanism as the man who was the subject of the preceding observation. The bones had also pierced the skin, and the youth being carried home to his parents, the fracture was very exactly reduced; he was blooded, and confined to a proper diet. He was attended very assiduously by one of my brethren in the profession, and myself; on the twelfth day, he was again seized with convulsive spasms in the lower jaw, accompanied with an obscure delirium; and on the thirteenth, he died. He is one of the three patients spoken of in the preceding note.

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The tibia, in particular, may experience, from the effects of a counter-stroke, another kind of fracture, of which the other bones are certainly but little susceptible. At least it does not appear impossible to me, but that, in a violent shock on the tibia, the compact substance of this bone may resist, while there may be a fracture in the transverse bony fibres, which compose either the spongy or the reticular substance. May not a rupture of some of the fibres of this last substance be occasioned by a fall on the feet, or by leaping from a certain height, while the body of the bone shall remain entire? May not an injury of this kind give rise to an abscess in the cavity of the bone, and to all the mischiefs which must attend such a complaint? The following fact seems to speak in favour of what is here advanced.

A young man, of five and twenty years of age, having received a violent blow on the broad surface of the left tibia, had nothing more than a contusion externally without fracture, which soon gave way to spirituous topics that were applied to it. He still continued, however, to feel an obtuse kind of pain, which seemed to come from the inside of the bone. He paid little attention to it for four or five months; but the pain, which then became more acute, was accompanied with a swelling of the bone, which increasing gradually, produced an inflammation of the periosteum and integuments, the matter of which bursting of itself, left a fistulous opening externally (*f*). By passing a probe into this opening, it was found to penetrate into the cavity of the bone. The patient being properly prepared, the exostosed part of the tibia was laid bare throughout its whole extent; the crown of a trepan was applied over the fistulous orifice in the bone, and the parts surrounding the exostosis, were removed by the gouge, chisel, and mallet. By these different proceedings, an opening was made through the bone, (which, though exostosed, was very hard) sufficiently large, to enable the operator to extract a piece of bone, eighteen lines in length, which being insulated in the medullary cavity, afforded us an instance of a true internal exfoliation (*g*).

With respect to simple and compound fractures of the leg, they are most commonly the effect of counter-strokes, since all those which happen in the instance of falls, are seldom the result of a blow immediately applied to the part of the bone that gives way. But as they require no other treatment than that which is equally applicable to fractures in general, I shall proceed immediately to consider the effects of counter-strokes on the joint of the knee.

Although this joint may sometimes be exposed to the effects of counter-strokes, it must however be acknowledged, that, in cases of falls on the feet, the great surface by which the os femoris and the tibia are in contact with each other, and the intervening cartilage which is met with in the joint between these two bones, are contrivances well calculated to elude the effects of counter-strokes which the joint might suffer. The circumstance which renders these effects less frequent, and less to be apprehended, is, that the shock must be very violent in order to produce any mischief; and this could not be in the instance of leaps, or falls on the feet, unless the whole weight of the trunk bore directly upon the articulating surfaces of the tibia; that is to say, unless the thighs and the trunk, at the instant of the shock, should maintain that rectilinear position which would make the line of gravity of the upper parts bear upon the articulating surfaces of that bone. It is evident that such a position must be very difficult in a part which has so many joints and bendings as the trunk, and the inflections of which depend upon such an infinite number of muscles. But supposing even this position to exist, the effects of it would not be felt in the knee joint; they would rather take place in the articulation of the thigh with the os innominatum: the head of the thigh bone might be separated, and its neck fractured, on account of the oblique direction with which the weight of the body bears upon these parts; or if the shock were not violent enough to produce such effects, it might occasion a contusion in this joint. It might even happen, from the position above supposed, that the motion of the head upon the spinal column being suddenly stopped, might occasion a mortal commotion in the brain, even in those cases where the shock of
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the os femoris upon the tibia would not be sufficient to produce the least mischief at the part where these bones are connected. Notwithstanding this, the knee joint is much exposed to the effects of counter-strokes ; but they are chiefly occasioned by falls upon the knee, or blows upon the patella.

Reason admits the possibility of counter-strokes with bad consequences, in this part, and facts confirm it.

A lad, of thirteen or fourteen years of age, having received a blow with a wooden shoe on the knee, while the leg was half bent, the contusion was scarce felt externally, notwithstanding which, he experienced at the instant, a sharp pain, which seemed to come from the inside of the joint. This pain was soon relieved ; but he still continued to feel it in some degree, and a tumour appeared, which increased gradually, with a difficulty of walking. A fever came on, and the pain grew more violent about a month after the accident. It was at this period that the patient, who had hitherto received scarce any assistance, came into the Hospital, and was under my care. A few days after, the fluctuation being evident in a certain extent of the tumour, it was opened, and a considerable quantity of very fluid matter was discharged. It was thought at first, that it came only from under the integuments ; but becoming more and more ferous afterwards, and the wound not healing, mischief was suspected within the joint ; and in order to determine the point, the bottom of the abscess was completely laid open ; upon which a small sinus, leading into the joint, manifested itself. In vain, after this discovery, were all possible means tried to cure this young man ; deterfive injections, a proper position of the limb, dilatation and opening of the capsular ligament, every thing proved unsuccessful. It being no longer possible to preserve the patient's life without amputating the thigh, which his parents would not consent to, he died some time after. The joint being opened, manifested a very advanced caries of the articulating condyles of the leg and thigh, with an almost total destruction of the crucial ligaments. The internal surface of the patella was affected only with a su-

perforial caries; and its external surface, which had received the stroke, had experienced no kind of alteration.

Effects similar, or nearly so, of counter-strokes in the knee joint, would undoubtedly occur more frequently, after violent falls on the knees, or sharp strokes on the patella, if proper means, which readily present themselves to the surgeon, were not used to prevent these consequences. Rest is the first of the remedies which it is proper to have recourse to in these cases; and the single precaution of avoiding, for a few days, every kind of motion of the knee joint, assisted with two or three bleedings, and the use of some emollient and anodine embrocations, such, for instance, as the balsamum tranquillum, or the application of some resolute cataplasms, would probably have prevented the mischiefs which I have just been giving an account of.

But the following case, is one, which more particularly proves, that falls upon the knees, do not always confine their effects to injuries within side the joint.

A woman, about fifty years of age, was brought to the Hospital after a fall upon the right knee; the patella was not fractured, but the parts surrounding it were much swelled; and the pain she felt in the motions of flexion and extension (^b), might have been supposed to arise only from the violent contusion which the external parts had suffered. By careful examination, however, and repeated trials, I discovered an evident fracture of the lower part of the thigh bone, or rather a separation of its condyles. Fractures of the thigh very often arise from a similar cause; the kind of arch formed by the thigh bone, renders it, notwithstanding its strength, very liable to fracture, when in falling from a certain height, the inferior extremity of this bone is suddenly checked, while its upper part is still pressed upon by the weight of the whole body in motion. The mechanism of the fracture which then takes place, is easily understood; and the method of cure which it requires. It is exactly the same as if the fracture had been produced by a blow applied immediately to the

the broken part. The treatment proper for these accidents is too well known, to make it necessary for me to enter into any details upon the subject. There is one observation, however, to be made; which is, that in a fracture from a counter-stroke, the bone being broken at the instant that the force which occasions the fracture, is superior to the resistance of the bone, the rest of the motion may be spent on other parts; while there are cases, where the shock, being applied immediately to the part where the fracture happens, continues to exert all its action upon the spot itself, after having produced the principal injury we have been mentioning. This circumstance may deserve some consideration respecting the cure of these accidents.

Although most of the fractures happening to the body of the thigh bone may be the effect of counter-strokes, they are not, however, always owing to this cause. But the same cannot be said of fractures which happen to the neck of this bone, since these are never the consequence of a blow received immediately upon the part. The circumstances under which this fracture usually occurs, demonstrate sufficiently that it must always be the effect of a counter-stroke. It hath often been produced by a fall upon the great trochanter; and it is sometimes occasioned by a fall on the feet, or on the knees. It may be observed however, in this respect, that the fracture of the neck of the thigh bone will scarcely happen, if the two knees, or the two feet, bear at once and equally upon the ground, even supposing the body to be maintained in that straight line which would make the whole weight of the upper parts press upon the heads of the thigh bones; and this, 1st, because the effect being divided between the two thigh bones, would be lessened; and 2dly, because this effort being conveyed obliquely over each of the heads of these bones, the ossa innominata may, in some measure, glide over them⁽ⁱ⁾; a circumstance which will render the fracture of the neck of the thigh-bone more difficult. But when the weight of the body bears only upon one extremity, although the fall be not even from any great height, yet the motion of the upper parts being entirely spent upon the neck of the thigh bone, which is in an oblique direction to the line of gravity passing through

through the head of that bone ; and the os innominatum not being able to glide over that head, because it presses upon it perpendicularly, this gives us the reason, why the neck of the thigh bone is more readily broken, under this circumstance than under the former. Suppose the quantity of motion to be absorbed were the same in both instances, a fall, or a violent blow on the great trochanter, may likewise, and in fact often doth produce this fracture. In the accident of falling on the feet or on the knees, the inferior extremity of the thigh bone being stopt, while the head of it is greatly pressed by the upper parts in motion, tends more and more to form the arch, and breaks the bone at its neck, where the arch is already begun. In the instance of a fall on the great trochanter, on the contrary, the head of the bone resisting in its cavity, while the most prominent part is stricken externally, the intermediate piece, which is the neck, tends to resume the straight line, and is fractured by a mechanism the reverse of the former. But still the accident is the same in both cases, and requires the same treatment. The proper modes of reducing this kind of fracture, and those which can best maintain the reduced pieces in their situation, are then to be adopted. These are fully discussed in Mr. SABATIER's paper in the fourth volume of the Memoirs of the Royal Academy of Surgery, at Paris. I shall only add to the wise precepts contained in this paper, that besides the junk placed on the internal part of the thigh, it will be proper to place two other junks on the outside, which extending from beyond the feet, proceed far above the hips, passing one above, the other below the great trochanter. The upper extremity of these junks being fastened by a bandage passed round the body and the hips, the motions of the thigh are by this contrivance admirably well confined. By this additional precaution, accompanied with the most absolute rest, I have succeeded in curing, with tolerable ease, some fractures of the neck of the thigh bone, which have left only a very slight degree of lameness after them. It will be proper also to recollect, that this fracture may be complicated with contusion in the joint, or on the great trochanter ; and that this complication requires attentions which I shall have occasion to speak of hereafter,

It must not however be supposed, that a fall, or even a considerable shock on the great trochanter, are always capable of producing a fracture of the neck of the thigh bone. In order to accomplish this, it is necessary that the direction of the shock should coincide with the force of the motion impressed upon the part, if this motion be made in the direction of the fibres of the neck of the thigh bone; otherwise, the head of this bone would sooner be crushed against its cavity, or the cavity itself would be broken, rather than the neck of the bone. But if the direction or sum total of the motion be such, that the fracture cannot be the result, then the counter-stroke produces another kind of injury, frequently more dangerous than the fracture; that is, the contusion of the joint, and particularly the squeezing or bruising of some of the parts that are contained in it. The round or inter-articular ligament, which, in progressive motion, is never squeezed, may become so in a fall, or in a shock upon the great trochanter, when the direction of the motion tends forcibly to push the head of the femur immediately upon the part from whence this ligament proceeds. The synovial glands, which form a considerable mass in this joint, may also be roughly squeezed, between that part of the cavity which they occupy, and the head of the bone driven with force against them; hence will arise accidents proportioned to the nature of the injury done to the joint.

In the first instance, pain, swelling and inflammation of the parts contained within the joint, always manifest themselves, accompanied with a difficulty of motion in the limb; and the intenseness of the symptoms is proportioned to the violence of the shock, and to the greater or less irritable state of the patient. The pain is often acute in the beginning, and is attended with a total inability to move the limb. At other times, the pain is dull, so as, at first, scarcely to engage the attention of patients: they continue to walk, though with some difficulty; yet still they keep upon their feet, and sometimes persist in hard labour. This difference may arise from the nature of the parts bruised. I should imagine, that when the ligament is bruised, the pain and other symptoms are more violent, and that the contrary happens when the synovial glands have

have partaken of the injury. The complaint which is the consequence of this last accident, may be ranked in the class of chronic disorders. The glands tumefy, and sometimes secrete a synovia, which partaking of the distempered state of the organs that supply it, is not entirely absorbed, and may produce a dropsy of the joint, a partial ankylosis, or a luxation from relaxation^(k); or else this liquor degenerating, becomes acrimonious, destroys the cartilage lining the surface of the joint, and the head of the bone; the articular and capsular ligaments are corroded with caries, and in process of time, an abscess is formed externally, the opening of which serves only to hasten the death of those who are affected with it.

It may also be presumed, that the contusion of the cartilages themselves, and that of the bones, which may very possibly be the consequence of a violent shock in the joint, may sometimes be the cause of all the mischiefs within. Those cases, undoubtedly, in which the progress of the symptoms is very slow, afford us instances of similar contusions. The following fact seems to corroborate the preceding observations.

A woman, about eight and twenty years of age, laden with a basket full of bottles, having jumped down a few stairs in going into a cellar, preserved the center of gravity of the upper parts upon the left thigh and leg so well, that she kept herself from falling; but she experienced, in the inside of the joint of the hip, a violent shock, which was, however, attended only with a very bearable degree of pain, since she was able to continue her ordinary work for more than a fortnight, without complaining. But she still felt, in walking, a pain which gradually increased, from the continual exercise she was obliged to use in her capacity of servant: the difficulty of motion increased with the pain; and both the one and the other, three months after the accident, were grown so much worse, that the woman was no longer able to support herself upon that limb. At this period she came into the hospital where I attended; different embrocations were used to the upper part of the thigh, but without any effect; resolute, anodyne, and maturing cataplasms were then applied, because a tumour manifested itself at the upper posterior, and

external part of the thigh, which seemed tending to suppuration. A fever came on; and when the abscess became evident, all the openings and counter-openings were made, which the sinusses the pus had formed, required; the matter which came out, had no kind of offensive smell: it brought away along with it some small bony particles, and an oleaginous fluid floated on the surface; the incisions were lengthened as much as it was thought necessary, setons were passed, and during the course of the treatment, vulnerary and deterfive injections were tried, such as were imagined to be best suited to the state of the parts. At different intervals, small portions of bone came away, separated either from the head of the thigh bone, or from the cavity of the joint, into which several of the sinusses penetrated. A slow fever, and a marasmus, which is its usual attendant, destroyed the patient, between three and four months after her admission into the hospital. Upon examining the seat of the disease, I found the capsular ligament almost destroyed, the round ligament totally consumed, the head of the thigh bone carious in all its surface, and even to a considerable depth in its center; the cavity of the joint was also attacked with caries throughout its whole extent; and lastly, its cartilaginous border was completely destroyed. The following is an instance of mischiefs nearly similar, produced by a fall upon the great trochanter.

A man about forty years of age, having slipped down upon the great trochanter, felt a sharp pain which obliged him to stay at home for a few days; but the pain being relieved, he chose to return to his business, and walk about, which however he could not do without pain, or without some kind of difficulty, which he endeavoured to strive against for about a fortnight; but the pain encreasing, he was obliged to take to his bed, and to apply for relief in the country where he was. All the means employed during three months, were ineffectual; the upper, posterior, lateral, and external part of the thigh was much swollen; and every motion attempted to be given to this extremity, was very painful to him. When he was brought into the hospital, it was soon perceived that there was matter formed in the vicinity of the joint; so that the surgeon formed a very unfavourable prognostic of the case. Several instances having shewn

him, that these diseases were incurable, in which ever way they were treated, he had almost resolved to leave this case to the efforts of nature alone. The fluctuation of the pus being, however, manifest, he determined to give vent to it by a suitable opening; the pus which came out at first, had no sort of bad smell, as in the preceding observation; but that which flowed at the subsequent dressings, was both great in quantity, and offensive; several sinusses led to the head of the thigh bone, and into the inside of the joint. The patient did not long survive this opening; the fever increased, the discharge became serous and very foetid, and he died three weeks after the operation. Upon examining the joint, the same mischiefs nearly were found as in the preceding observation; only the capsular ligament still existed entire, at the internal part of the thigh; but it was much thickened and inflamed there.

In 1762, a man, of forty-five years of age, having fallen upon his right knee, at the time that he was heavy laden, could neither rise up again, nor support himself upon his thigh. Being carried home, some means were tried for his relief, notwithstanding which, the pain, with the inability of walking, still subsisted. After he had kept his bed about a month, he began to walk with crutches; a swelling came on in the neighbourhood of the joint, which terminated in an abscess that burst of itself, about a year after, and left two fistulous openings, which gave vent to a greater or less quantity of matter; frequently these orifices were even closed, and only burst open again, when there was a certain quantity of the pus collected. Three years having elapsed in this state, without his having been able to make any use of his limb, he came to the Hospital, having at the upper and back part of the thigh, a very considerable collection of matter, which not finding an issue through the openings already mentioned, was let out by a simple puncture with a lancet, that the patient might, if possible, avoid the melancholy fate of those who had been treated in a contrary manner. The matter, which flowed in great quantity, brought away with it, several fragments of bone; and the new opening added to the former, another fistulous orifice, which favoured the habitual discharge of the matter. The patient survived

wived the operation ten months; and upon examining the part, the head of the thigh bone was found completely foldered with its articular cavity; each of them presenting alternate asperities and cavities, which formed reciprocal indentations, as was evident, in separating this connection by force. I shall farther observe, in this respect, that the thigh bone was ankylosed at a right angle with the trunk; a circumstance which had undoubtedly proceeded from the situation of the patient, whose head and trunk had been always much raised. I could adduce several other instances of similar diseases of the joint of the thigh with the os innominatum, which had been the consequence of falls, either on the feet, or on the great trochanter, if these instances could give us any better information respecting the treatment necessary to be followed in such cases: the account of mischiefs that have been observed, is undoubtedly useful, inasmuch as it may suggest a rational and more certain plan of cure. But there is no need here of a greater number of facts, to determine the curative method to be pursued, in all circumstances analogous to those which I have just submitted to the consideration of the Academy.

When once we are acquainted with the mechanism of the counter-strokes which the inside of the cotyloide cavity may experience; when we know the direction of the motion which has been impressed on the parts by the body producing the shock, and can estimate nearly the quantity of this motion; and when we are conversant with the nature of the different parts which may be injured, contused, and squeezed by the shock; we are then able to determine, for the case that presents, a method of cure founded on rational principles. Besides, the accidents which the three patients have suffered, of whose disease I have given a succinct account, are fully sufficient to explain the curative indications to be pursued in all cases of a similar nature.

All the mischiefs consecutive to the counter-stroke in the joint, whenever it doth not produce fracture, can only proceed from the contusion and collision of the parts contained in it; but this collision and contusion can only give rise to a pain more or less acute, to a swelling and an in-

flammation more or less considerable. The methods of cure to be employed in such circumstances, will be every thing that can alleviate the pain, and prevent the swelling and inflammation of the injured and bruised parts. Bleeding, rest, and a regimen, are very proper to fulfill this double indication ; but the bleeding must be repeated several times, and even at short intervals, if the pain should be violent. Rest must be absolute, that is to say, that all kind of motion of the thigh upon the trunk, or of the trunk upon the thigh, must be prohibited till the time for the coming on of the bad symptoms be past ; because however slight may be the friction of the contused and inflamed parts upon each other, it cannot but be extremely painful. With respect to the diet, that must be very strictly observed.

It is undoubtedly for want of having taken these precautions in the first period of counter-strokes in the joint of the thigh, that several patients have experienced that long series of accidents that has brought them to the grave. Nothing is therefore more essential than to recommend lying in bed to those who have received, by counter-stroke, violent shocks in the joint of the hip, and to confine the limb in such a manner, that the head of the bone shall not be able to play in its cavity, more especially when motion is extremely painful. This precaution, however, will not prevent us from having recourse to repeated bleedings, to a diet more or less rigid, and to resolute topics applied round the joint. Although we can have no great dependence upon these topics, on account of the depth of the parts on which they are to act, yet they are not to be neglected. Spirituous, resolute applications, for instance, may perhaps convey their effects farther than we suppose. It is by pursuing this kind of treatment, which is that of all well-informed practitioners, that I have seen many of these shocks, though violent, unattended with any serious consequence ; while others, which in the first instance seemed to require no attention, have produced the greatest mischiefs, for want of having taken the above-mentioned precautions in time. Rest, above all, is the first of remedies ; and we cannot be too attentive in fulfilling this curative indication.

Supposing

Supposing however, that these means of cure should not have been employed in time, or that they should have been ineffectual, and that, to the primary accidents of contusion in the hip joint, there should succeed an abscess in the cavity, with destruction of the ligaments, caries of the articular surfaces, &c., how are we to proceed in this case? Must the patient be left to his deplorable fate, and must art remain inactive under such circumstances? We should be almost tempted to answer in the affirmative, from what we have seen of the inefficacy of its efforts in several of these cases. Art here consists less in doing, than in avoiding to do what may be done; for a cure of this kind can only be the work of nature.

The instance we have given of the folding of the thigh-bone with the os innominatum, serves at least to shew us one of the resources which nature reserves to herself in desperate cases. Suppuration having once taken place in the inside of the joint, the soft and flexible parts which border it and maintain the bones in their situation, having been destroyed, nature hath no means of preservation left, but to form, by a complete anchylosis, one continued bone between the trunk and the thigh; and she tends to this end by the very mechanism, by which the destruction of the injured parts is effected. In consequence of inflammations and suppurations formed in the joints, the ligamentous parts are insensibly consumed, the bony and cartilaginous parts grow carious, and exfoliate in the same manner, and the fragments of them are drenched in the pus which is daily forming in the neighbouring parts attacked with suppuration. This pus, while it is not susceptible of spontaneous alteration, from the access of the air into the cavities where it is collected, is for the most part a mild and beneficial fluid, which, far from re-acting upon the bony and cartilaginous parts, takes charge, on the contrary, of their fragments, and serves as a vehicle to carry them out, after having, undoubtedly, contributed to detach them from the mass that supplied them.

Now

Now we know, that when the organic action of the vessels of the sound bone hath accomplished, either in one piece, or in detached portions, the exfoliation of the bony parts that were diseased, and that this exfoliation has been removed by art, or carried away by the powers of nature alone; we know, I say, that the sound bony texture remaining, endeavours to unite itself, either to the neighbouring flesh, the nature of which it hath almost adopted, or to other bony portions which may have undergone the same changes. It is therefore no way surprizing, according to the preceding observation, that the whole surface of the head of the thigh bone, and of the cavity which received it, having exfoliated by degrees, and the fragments of this exfoliation having been continually carried away by the discharge, these surfaces should have been foldered together, so as to make but one common bone. Would it have been more surprizing if this great effect had been accomplished without the destruction of the patient? Can we be certain that the patient, from his constitution, was in circumstances the most favourable for the success of the event? Can we be certain, in a word, that the operations of nature, as well as those of art, had not been counteracted by imprudent motions, as much during the three years that this man, who was very poor, languished at home, as during the ten months he lived in the Hospital?

Diseases of this nature do not therefore seem to me entirely beyond the reach of art. The long space of time the patient lived after the evacuation of the pus by the fistulous openings, compared to the time those patients lived, in whom large incisions were made to procure this evacuation, seems, in some measure, to indicate the proper mode of proceeding in such cases. From this instance, and others, which I cannot quote upon this occasion, because they have no connection with the question of counter-strokes, I should imagine, that when the original accidents have unfortunately failed of effectual relief, and that an abscess has been formed in the joint, which shall have manifested itself externally by evident signs; I should imagine, I say, that we should not be in haste to give vent to it; and if it should be thought indispensably necessary to let out the pus, this should only be done by puncture with a trocar. The pus,

in these cases, seems to be a kind of bath for the bone, to which it owes all the advantages we have been describing. So little should we consider the pus as a noxious fluid, that, in these instances, I have never found it tainted with the least smell, even when I have let it out after the collection had been formed several months, and in quantities so considerable as to amount to two or three pints, among which several fragments of bone have been found floating. But it is necessary to repeat, because it is an instructive observation, that in less than three days, when these abscesses have been largely opened, the matter, which at the time of opening was always of a proper consistence and perfectly devoid of smell, has become thin and very foetid. Perhaps by adopting the method I have proposed, with respect to the time and manner of opening these immense abscesses which are formed in consequence of violent contusions in the joint of the hip ⁽¹⁾, and by making the patient abstain from all motion which might impede the operations of nature and those of art, the complete ankylosis of the articulating surfaces might be obtained, which, in the desperate cases we are speaking of, is the only resource we have to look up to. To what has been said upon this subject, I shall add, that it would be proper to endeavour to put the lower extremity and the trunk in such a position with respect to each other, that after the formation of the ankylosis, the latter should preserve, as much as possible, a vertical direction with the limb.

SECTION

S E C T I O N II.

THE EFFECTS OF COUNTER-STROKES ON THE SEVERAL
PIECES THAT COMPOSE THE TRUNK, AND THE TREAT-
MENT PROPER FOR THEM.

WHAT has just been said of the mischiefs not unfrequently produced on the lower extremities by counter-strokes, leads us the more naturally to examine what may be the effect of counter-strokes on some parts of the trunk, inasmuch as these extremities themselves are the medium through which the shock is transmitted to those parts. It may, indeed, happen, that in falling upon the feet, the thigh bone may resist, and yet that some of the lower pieces of the trunk may receive a counter-stroke capable of being injurious to them. The os innominatum, the os sacrum, and the last of the lumbar vertebræ, are the parts that are most liable to this accident. If it be impossible that the os innominatum should be fractured over the head of the thigh bone, as it may be presumed, yet that bone may, at least, sometimes experience contusions in its cavity; but

this accident is included in what I have said of the mischiefs that are done to the hip joint, when there is a violent counter-stroke felt in the cotyloide cavity of the os innominatum.

With respect to the os sacrum, though articulated by large lateral surfaces with the ossa innominata; and though firmly attached to these bones by intermediate cartilages, and by very strong ligaments, it is nevertheless liable to at least partial disjunctions, from the violent counter-strokes it sometimes suffers. We have too many instances of this to call the matter in question; besides that, it is sufficient to examine what happens in some falls on the feet, to be convinced of the possibility of a kind of disjunction of the os sacrum from the os innominatum. Let us suppose that in one of these falls the direction of the motion shall be such, as that none of the lower parts can have suffered either inflexion or fracture; in that case, all the momentum of the upper parts, multiplied by their weight, is spent upon the superior part of the os sacrum, which receives a most violent shock from above downwards, while the ossa innominata remain unmoved. The os sacrum is then driven like a wedge between these two bones; but the manner in which their articulating surfaces are constructed, the cartilage which lines them, the connections which unite these bones to the os sacrum, and the lateral pressure they then exert upon it, by means of the obliquity of the neck of the thigh-bone, are the reason that none but the most violent shocks can produce the kind of disjunction we are speaking of; which might however be effected by another mechanism, if nature had not provided against it. In the case we have been supposing, the sacrum, at the same time that it is driven as a wedge between the two ossa innominata, endeavours to make a swing forwards, while it is effectually opposed, not only by all the ligaments which connect it at its upper part to the neighbouring bones, but also by the sciatic, and ischio-sacro-sciatic ligaments, which acting upon the sacrum with a lever much longer than that of the power, on account of their attachment to almost all the lower extremity of this bone, are capable of opposing with greater force the swing forwards, which the shock, received at its upper part, tends to make it produce^(m); whence

whence we perceive how difficult it is, in the circumstance of very rapid motion of the trunk upon the lower extremities, that any mischiefs should be produced in the parts which concur in the union of the ossa innominata with the os sacrum, especially when both the extremities bear together.

But it may happen, that the shock shall be so violent, as to elude all the precautions taken by nature, and to produce, even in the case here supposed, if not a disjunction of the bones, at least a divulsion of the ligaments that connect them, a contusion of the cartilages, and of the bones themselves; injuries which almost always produce very serious complaints; or it may happen, that the motion of the trunk, being stopped by one of the extremities only, the force shall be spent entirely upon the articulating surface of the sacrum on one side, and that in the very disadvantageous circumstance of that bone being neither pressed upon laterally, nor supported by the opposite side. Even admitting in this case that the velocity of the upper parts, multiplied by their weight, should be reduced to a small matter when it came to be applied to the os sacrum, yet it would not be surprizing, that the parts which strengthen the articulation of this bone, on which the whole effort is spent, should suffer, at the instant of the shock, a very dangerous divulsion. All that has been said here, is nothing more than an anticipated explanation of the mechanism by which shocks, conveyed by a counter-stroke to these parts, have given rise to the mischiefs that have fallen under my notice.

A man of forty years of age, having climbed a tree, fell upon his lower extremities from the height of about fifteen feet, and at the instant of his fall, had no other sensation than that of a general commotion, accompanied with a sharp pain at the bottom of the spine. Being brought home, he would not submit to be blooded, and only took a few bottles of vulnerary infusions. The very next day, he went out; the little pain he felt, did not seem to him to merit any attention; he walked tolerably well for several days, and followed his business as usual. But about the thirtieth day from his fall, he began to grow lame; still however he felt

nothing more than a dull pain about the region of the os sacrum, towards the right side; the pain increased, and on the fifty fifth day the difficulty of walking was so considerable, that he could not do it without a stick; urged by his complaint, which now began to make him uneasy, he applied for assistance. Having a slight degree of fever, he was bled; rest, and the use of resolute fomentations, were prescribed to him; and lastly, embrocations made with the martiatum and oil of nutmegs, animated with salt ammoniac; but this was without any success, the period of the efficacy of these means being passed. The complaint continued increasing for five months, at the expiration of which, the patient could not bear in the least upon the right limb; the motion of bending the thigh upon the trunk was both extremely painful and difficult; and a tumour began to manifest itself, which came from under Poupart's ligament. Such was the state of the patient when he came to the hospital for relief.

The history of his disease left us no room to doubt of the nature of it, and unfortunately it afforded but a very melancholy prognostic. Suppurating cataplasms were applied to the incipient tumour, which, during the space of three weeks, increased but little. He was then seized with vomitings and hiccoughs, as if he had had a strangulated rupture. The tumour being somewhat lengthened towards the inside of the thigh, and there being no doubt of its containing matter, it was opened a few days after; a large quantity of white inodorous pus was evacuated; the patient was then free from fever; he was dressed with dry lint, and afterwards with digestive. The pus, which had been at first white, and devoid of smell, having become thin and very offensive, vulnerary, deterfive and spirituous lotions, were injected into the abscess; and the dressings and injections were more frequently repeated; but all these precautions were fruitless, the fever increased with the putrefaction, and the patient died on the ninth day after the opening.

Upon examining the body, all the upper and lateral portion of the sacrum on the right side was found carious, as well as the corresponding
part.

part of the os innominatum. There was an evident separation between these two bones, and the whole of the sacro-iliac symphysis was attacked with caries. The last of the lumbar vertebræ was also carious at its lower part, and the suppuration had in great measure destroyed the psoas and iliacus internus muscles. These mischiefs were probably the result of the divulsion, which the parts, destined to strengthen the union of the os sacrum with the os innominatum on the right side, had experienced, at the instant of the fall⁽ⁿ⁾; and this divulsion must undoubtedly have been produced according to the mechanism above mentioned. With respect to the symptoms that succeeded, they are the necessary consequences of the dull inflammation of these parts, and of the subsequent suppuration, and they might possibly have been prevented, if suitable means of relief had been timely administered.

A woman accidentally jumped down a few steps, a short time after having been delivered. At the time, she felt nothing more than a trifling pain in the region of the loins, which some days after grew worse, and was accompanied with a difficulty of walking, which increased gradually till she could no longer support herself upon the left leg. The pain she suffered, though not very violent, was continual; and all these accidents were attributed to an overflow of the milk, the more readily, as the upper part of the thigh and the hip on that side began to increase in size. This woman, who had not been carefully attended to in the beginning, was brought to the hospital, after having kept her bed upwards of three months at home; and at that time, a very large abscess appeared to be forming at the back part of the buttock, the matter of which had made numberless sinusses, which proceeded from the pelvis by the ischiatic notch. This abscess having been properly opened, furnished a large quantity of pus of tolerably good quality, and devoid of smell; it soon however became thin, of a brown colour, and very foetid; the fever, which had been more or less considerable during the disease, increased; a delirium came on, and the patient lived only eight days after the opening had been made. The examination of the body presented the sacrum, and the os innominatum on the left side, carious throughout the whole

of their correspondent articulating surfaces; and in prosecuting our researches, we found the upper part of the sacrum likewise attacked with caries, as well as the last of the lumbar vertebræ.

The nature of the cause, and the circumstance in which the woman was at the time she received the shock, together with the accidents she experienced in the sequel, every thing announces, that there was a kind of disjunction or divulsion of the sacro-iliac symphysis ^(o). The two preceding observations would properly come in support of the possibility of this disjunction from an external cause, if even it had not been evidently demonstrated by a fact, in the case of a man named Binai, of which M. Louis hath given an account, in his history of the Royal Academy of Surgery ^(p).

From what has been said, it is apparent, that in the case of a fall upon the lower extremities, when the motion is suddenly stopped, there must be many circumstances united to occasion such a counter-stroke as shall be capable of accomplishing the disjunction of the sacrum from the ossa innominata, or only a certain divulsion of the medium that connects them. But without a shock so violent as is necessary to produce such mischiefs, counter-strokes may occasion, in the neighbouring parts, injuries entirely as dangerous as those, the unfortunate issue of which I have been mentioning. In a fall upon the two feet, which may have happened without fracture of any of the pieces that compose the lower extremities, without contusion of the joints that are found in them, and even without any apparent divulsion of the sacro-iliac symphysis; it occurs but too frequently, that the whole effort of the counter-stroke bears upon the basis of the os sacrum, and upon the last of the lumbar vertebræ. In the fall upon the feet or upon the buttocks, for instance, it is very possible, that the motion of the upper parts upon the basis of the sacrum, should be so rapid, that this basis, the last vertebræ of the loins, and even the strong and almost bony cartilage which unites these two bones, shall experience a degree of pressure, sufficient to disturb their organization, and their internal texture; and consequently to give rise to subsequent

quent mischiefs of a very serious nature (*q*). This assertion is not made without foundation ; for I have found, that many of those disorders which are called abscesses of the psoas muscles, might with propriety be ascribed to the violent pressure of the last of the lumbar vertebræ upon the sacrum, &c. There is the greater reason to imagine this, because, in these kinds of abscesses, the fourth and fifth of the lumbar vertebræ are sometimes carious to a considerable depth, as well as the anterior and upper part of the sacrum ; this is at least what I have observed in the bodies of several persons who have died in consequence of such abscesses. The following fact, which I have selected from among many others of the same nature that I have noticed, seems at least to confirm my conjectures upon this point.

A strong and vigorous man, forty two years of age, having leapt, in August 1765, from about eight feet high, felt at first, nothing more than a pain of a very doubtful nature, in the region of the loins. This pain was even dissipated a little while after ; but it soon returned, and continued, though in a very moderate degree, upwards of a month. At the end of September, the pain increased by very perceptible degrees ; and was much more considerable, particularly when the patient was coming down stairs. The primary cause of his complaint having escaped his memory, he conceived it to be the rheumatism ; but time, and the proper means of alleviating his pains, having proved ineffectual, he began to be uneasy. His disorder now grew worse every day ; a difficulty, and afterwards an impossibility of walking, came on ; and in February, 1766, a collection of matter began to shew itself at the anterior, internal, and upper part of the thigh. This abscess was opened in March, and in a short time the patient experienced the same fate as the other two persons, whose cases I have given an account of. The examination of the body, presented a caries of the upper and fore part of the sacrum, and of the bodies of the two last lumbar vertebræ. Does not the slow progress of the disease seem to announce, that the suppuration and partial destruction of the psoas, were, in this instance, only secondary effects of the suppuration and caries of the neighbouring bony parts ? These diseases may be alternately cause and effect ;

effect; and the caries of the sacrum, and of the lumbar vertebræ, may give rise to the psoas abscess, as collections of matter in the psoas muscle may occasion a caries of the spongy bones that are near it.

I shall also observe, that a palsy of the lower extremities may sometimes be one of the effects resulting from counter-strokes upon the last of the lumbar vertebræ; and that the debility which these extremities experience, is the result of a gradual compression which is then made upon the spinal marrow, and which is the consequence of the mischiefs going on, either in the cartilages, or in the bony substance of the vertebræ. Nothing can be more simple than this process; the violent shock which the parts have suffered, causing them to swell, they must necessarily diminish the diameter of the channel of the vertebræ, and consequently compress, in a greater or less degree, the spinal marrow. I have seen this happen to a young man of two-and-twenty, who, having fallen upon his buttocks, from the top of a shed, seemed at first to experience no remarkable accident, since he continued his work for at least three weeks after, at the end of which, he complained of the increase of a dull kind of pain that he had always felt at the bottom of the loins, from the instant of his fall: he still walked with tolerable ease; but this motion became more and more difficult: the lower extremities grew weaker by degrees, and at length totally lost their power of motion, without the patient having been sensible of any great pain. Being brought into the hospital, and questioned with respect to the cause of his palsy, it was concluded, that it would soon be followed by an abscess of the nature of those I have been speaking of. Accordingly, about six weeks after, a tumour appeared projecting from under Poupart's ligament; this being opened some time after, when it became prominent outwards, the patient soon paid the tribute to nature. Upon examining the body, the two last of the lumbar vertebræ were found affected with caries; which in one spot penetrated even into the channel of the spinal marrow, while the psoas and iliacus muscles seemed likewise, in this case, to have suffered only secondarily. Abscesses originally formed in these muscles, are not, however, unfrequent; and although they be only indirectly the result of a counter-stroke,

stroke, it may not, perhaps appear improper to explain, in this place, in what manner a fall or an effort may give rise to them.

In a false step, or a fall upon the feet, if the upper parts do not bear perpendicularly upon the sacrum, but if, on the contrary, they bear a little behind, the person then will fall backwards. To prevent this accident, the psoas and iliacus internus muscles, the fixed point of which is then at their attachment to the little trochanter, act, at the instant, with power and celerity upon the trunk, to concur in bringing back the line of gravity of the upper parts on the basis of the sacrum, upon the bones of the thigh; but the sudden effort of these muscles is sometimes so great, that many of its fibres may suffer a rupture, which may give rise to an inflammation, and an abscess in the substance of them, and afterwards to a caries of the neighbouring bones; a disease of so terrible a nature, that art hath as yet discovered no resource against it. I have had so little reason to be satisfied with the methods I have tried, or seen tried, in a number of these cases, that I can venture to affirm, that it is the best way to leave those who are afflicted with this disease to nature, particularly when they are arrived to a certain period. The abscesses which come forward, then burst of themselves; they leave small fistulous openings, and the patients may live, at least for a certain time; whereas they all perish in a few days, whenever these immense collections of matter are opened largely. It is for this reason I propose hereafter to open, only with a trocar, any abscesses of this kind that may come under my notice; for notwithstanding what MAUQUEST DE LA MOTTE hath said upon the subject, I have never seen one of them, the opening of which could have been reasonably attempted, by plunging a scalpel into the abdomen.

It is not when counter-strokes have given rise to these extreme mischiefs, of which I have been mentioning instances, that we can pretend to oppose their effects; the original accidents, are those which we must particularly attend to relieve. But in order to do this successfully, we must make ourselves well acquainted with the mechanism of the counter-

stroke, we must be able nearly to estimate its power, we must know the nature and relative situation of the parts that have suffered; and from these preliminaries, we may form a proper judgement of the nature of the injury that has been produced at the instant of the shock. The method of cure then becomes rational, and leaves us no reason to apprehend those errors which are the consequence of empiricism and ignorance. With such principles, the proceedings we are to adopt in counter-strokes, the action of which bears upon the os sacrum, upon the sacro-iliac symphysis, and upon the lumbar vertebræ, are already traced out for us. The kind of mischief which such a cause may produce upon these parts, requires bleeding, more or less repeated, according to the violence of the symptoms; resolute and spirituous embrocations, a proper diet, and lastly, the most absolute rest. This cannot be too strongly recommended in disjunctions or divulsions of the sacro-iliac symphysis; and in this case, compresses dipt in resolute and spirituous topics, and supported by a circular bandage applied moderately light, and passing over the hip bones, are precautions by no means to be neglected. It is also necessary to have recourse to them in cases where the counter-stroke hath produced mischiefs among the lumbar vertebræ; but in this instance, the circular turns of the roller must be carried above the region of the loins; that part of the spine will be kept more steady by this precaution, and the bones which compose it will be less liable to be affected by motion, which is always hurtful in such circumstances. To these precautions we must add, that the horizontal position is the only proper one in these cases; but we must take little account of the number of days the patient is confined to his bed; it is better to carry our precautions too far, than to be deficient in them. So many unfortunate persons have been the victims of their own neglect in this particular, that the attention of practitioners cannot be too much fixed upon this point.

It is by the very simple means I propose, that after falls with counter-strokes on the os sacrum and the lumbar vertebræ, I have succeeded in relieving the first symptoms, which threatened subsequent mischiefs as alarming as those I have been mentioning: among several
 4 others,

others, I have selected the following remarkable instance of this. A young man, having fallen from the height of about thirty feet upon his buttocks, felt a very great pain in the region of the os sacrum and of the loins. The second, third, and fourth lumbar vertebræ, made even an evident projection outwards, and besides the impossibility which the patient experienced of supporting himself upon his legs, they were attacked with a considerable numbness, and were deprived of their quickness of sensation. Repeated bleedings, a strict diet, graduated and very thick compresses applied upon the projecting vertebræ, and supported by the circular turns of a bandage rolled very tight round the body; the attention of keeping the patient upon his back, with his head low, and a pillow under his loins; were the means by which this accident was perfectly cured, in less than six weeks. But the patient was more strongly induced to maintain the position in which I had placed him, by the diminution of his pain upon being put into it. I observed also, in the first days after the accident, that the tighter the bandage was, the more he was relieved; for which reason, I ordered it to be frequently wetted with brandy, to prevent it from getting loose; and when the effect was not answered by this contrivance, I made the whole bandage tighter by applying a fresh roller. The patient, who found himself daily growing better, attempted to rise on the twenty-sixth day; but his pains in the lumbar region returning, I confined him to his bed for ten or twelve days longer; and when he got up again, I advised him not to walk at first without the help of a stick, and to wear a tight bandage round his body, in order, for some time, to give greater firmness to the spine. A fall of this kind might have occasioned a divulsion of the sacro-iliac symphysis, especially if this young man, in falling, had pitched only upon one buttock, and upon the tuberosity of the ischium on the same side.

Although frequent instances occur, of the lumbar vertebræ being much exposed to the effects of counter-strokes, yet they are not the only vertebræ that experience the pernicious effects of a similar cause; for it may act also upon the dorsal vertebræ, so as to produce very great subsequent mischiefs.

mischiefs. Lateral distortions of the spine, and its excessive projection outwards, have been often occasioned by a counter-stroke, the shock of which hath fallen upon these vertebræ: at least I have seen many deformed persons who had become so, only in consequence of falls they had been exposed to in their younger days. With respect to the method of cure to be pursued, it is almost entirely prophylactic; it is scarce of any utility, except in the first instance, and should be little different from that which is adapted to the complaints of which I have been giving the history. Bleeding, rest, and a circular bandage round the body, may be sufficient: it will be proper, however, in children, to add to these methods, the remedies calculated for the rickets, whenever there appears a tendency to this disease, which is itself often the only cause of these deformities. Absorbents, tonics, bitters, preparations of steel, and especially an abstinence from all acedent food, are then the most effectual remedies.

After having successively examined the effects of counter-strokes on the different bones which compose the pelvis, and the greatest part of the spine, it remains only, to complete this section, that I should trace these effects upon the other bones which concur in the formation of the trunk. Among these, the cervical vertebræ do not appear to me susceptible of the bad effects of counter-strokes; but this cannot be said either of the ribs or the sternum. That the ribs especially, may be fractured in a part distant from that which receives the shock, is a fact which stands in no need of being proved; fractures of the ribs, with projection outwards, are always the effect of a counter-stroke, to which their form renders them liable. The rib being stopped short, as it were, backwards, at the same time that it receives a considerable shock towards its anterior extremity, is fractured in the middle: this may also happen when the shock bears upon the cartilaginous part of the rib, or upon the sternum, provided the body that causes it, have some extent of surface, and shall strike with a certain velocity; but the mechanism of this fracture, and the treatment of it, are too well known for us to dwell upon. If the shock should bear upon the angular or middle part of the rib, even in the instance where the opposite side of the chest should lean against some resisting body,

body, no injury can be done to the sternum, nor to the anterior part of the ribs ; and then the fracture, which may happen at the part that receives the blow, is no longer the effect of a counter-stroke. It could only be classed among the effects of such a cause, in those instances, where it should happen on the side opposite to that which received the shock ; which is not impossible in the supposition of the trunk leaning against some resisting body ; and in this case likewise, the best way of directing the cure is sufficiently known. With respect to the sternum, although from its situation and figure it should not be very liable to the effects of counter-strokes, yet it hath sometimes happened, that a fracture of this bone has been produced by such a cause, of which the following fact is an instance.

A mason, eight and twenty years of age, having been brought to the hospital, after falling from the height of about fifty feet, it was found, upon examining him, that he had a fracture of the left thigh, and that the spinal processes, of the last of the dorsal, and first of the lumbar vertebræ, were likewise broken. The fracture of the thigh being reduced, and the surgeon perceiving that the man could not bring his head forwards, examined in order to find out the reason of this, and discovered it to be a transverse fracture of the sternum, with a considerable interval between the first and second piece of that bone. The patient when on the ground, was found lying upon his back, with his left leg under him ; and upon the fore-part of the breast there was neither ecchymosis nor excoriation, nor any mark which could induce a suspicion that the fracture of the sternum had been produced by a blow upon the part. The mechanism of this accident, appeared therefore so problematical to the surgeon, that he found it difficult to account for it ; but a workman who was present, soon enabled him to solve this difficulty, by acquainting him, that the patient, at little more than one third of the course of his fall, had met with a projecting piece of scaffolding, which had given him a blow in the middle of his back. The surgeon, as well versed in the practice as in the theory of his art, immediately concluded, that the fracture of the spinal processes of the vertebræ above mentioned, and that

that of the sternum, were the consequence of this first shock, because, in the instant that the body had been stopped in its fall by the middle of the back, the lower extremities on one hand, and the upper part of the trunk on the other, had preserved a sufficient quantity of motion to force the spine to such a degree of extension, that the muscles which go from the sternum to the head, &c., being violently stretched, had effected the separation of the first bone of the sternum from the second. This mechanism is too simple, not to be readily understood. With respect to the curative indications that presented themselves for this double accident, they were fulfilled by a method as easy as it was effectual; so true it is, that a man of genius always enriches the art, while he seems to simplify it. The enlightened practitioner of whom we are speaking, ordered a hollow to be made in the bed, at the part corresponding to the fracture of the vertebræ; he placed thick cushions under the nates, with a pillow under the shoulders, and employed every precaution necessary to keep the spine constantly bent forwards, and to bring the head in the same direction: this he accomplished by attending only to the position of the patient. The elongation of the spine, which is never more considerable than in the state of flexion, brought back, into their natural situation, the spinal processes, which were a little turned to one side, and maintained them there by means of the constant tension of the ligaments and muscles that are fixed into it. The upper portion of the sternum was kept, by the same contrivance, in exact opposition with the inferior extremity; so that at the usual period of the cure of fractures, the patient went out perfectly well, and without having suffered any symptoms, except such as are usual, and to remedy which, the proper methods had been employed immediately after the accident. I make no doubt but that many fractures of the sternum have been produced by the same kind of mechanism, and which, for want of being known at the time, have given rise to abscesses, and to troublesome caries of the bones.

SECTION

S E C T I O N III.

TO EXPLAIN THE EFFECTS OF COUNTER-STROKES
ON THE UPPER EXTREMITIES, AND THE MEANS OF
RELIEVING THEM.

ALTHOUGH the upper extremities, in cases of leaps or falls on the feet, do not receive the first shock, yet they partake of it, at least very often, in such a manner as to suffer material injuries. If a person should fall from any height upon the lower extremities, when these come to the ground, they have seldom the whole weight of the upper parts to support, because the line of gravity of the latter passing, for instance, along the fore part of the cotyloide cavity, the trunk and the head continue to fall forwards, and the hands present themselves naturally to the ground, to ward off the violent shock which the head might receive, without this precaution of mere instinct. It is not necessary even, to confirm this observation, that the fall should be from any height. If a man, in walking, doth but lose his balance, he falls; if backwards, he throws his elbows and shoulders as far back as possible, in order to multiply

tiptly his points of contact with the ground; if forwards, he presents his hands and knees for the same purpose; and if sideways, the elbow. Thus it is that we instinctively avoid the commotion of the brain or the fracture of the cranium; but nature very frequently can only ward off these accidents, at the expence of the parts of less consequence, which seem so voluntarily to offer themselves for the preservation of this important viscus. Accordingly, we have already seen what the lower extremities are exposed to suffer, in many cases, in taking their share of this preservative intention (*l*); and it is in endeavouring to accomplish the same end, that we shall find the upper extremities also exposed to injuries which are almost always the effect of a counter-stroke.

If the palms of the hands strike upon the ground in any fall whatever, these parts being suddenly stopped, the body is stopped at the same time; and the bones which compose them receive the shock of the upper extremity, which is itself acted upon by part of the trunk in motion. This kind of shock, which is a real counter-stroke, may, and sometimes does, produce mischiefs in the joint, a divulsion of the ligaments which connect the neighbouring bones, or a dislocation of the wrist; which last accident belongs to the effects of counter-strokes taken in the most extensive sense. It may however be observed, that some of these injuries are less frequent than they might be supposed to be, and that for reasons which are derived from the mechanism of the fall. The direction of the motion being then in a midway between the vertical and the horizontal line, the bones of the carpus are always pushed directly against the bones of the fore arm, and this same direction farther eludes the violence of the shock, inasmuch as the hands being able to slide on a little forwards, the motion is not so suddenly stopped as it would have been without this circumstance. But notwithstanding this, and the loose attachment of the scapula, which renders the application of the weight of the trunk gradual, a fall upon the hands will not unfrequently occasion, in the joint of the wrist, the injuries I have been mentioning.

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The principal symptoms that characterise these injuries, are an acute pain, and a swelling, more or less considerable, with a difficulty of moving the part. If these original accidents be not relieved, an abscess, a caries, a complete or partial anchylosis, may succeed; at least I have seen instances of some of these terminations. The symptoms that first make their appearance, sufficiently indicate the kind of remedies to which we must have recourse; repeated bleedings, resolute topics, more or less spirituous; in certain cases, emollients, and anodines in others; retentive bandages calculated to prevent every motion of the part; are the only means to be employed in the first instance. But when the primary symptoms are relieved, balsamic embrocations may be tried, such as those made with the *balsamum tranquillum*, the *martiatum*, and the oil of nutmegs animated with a little volatile spirit of salt ammoniac; or we may use the soap of lead, quickened also with the spirit above mentioned. I have employed this last with success, in stiffnesses of the joints, with enlargement. I have seen some complete and true anchyloses, and two incomplete or spurious ones, in consequence of counter-strokes received in the joint we are speaking of⁽¹⁾, which have all happened to persons who had neglected to apply in time for proper relief.

But the effects of these counter-strokes are not confined to the wrist, they most commonly produce a fracture of the fore arm; and whether this fracture be simple or compound, it requires no other method of treatment than such as is well known. It must only be observed, that as the bones are at some little distance from each other, it is necessary, before the circular roller be applied, to place two slips of linen of tolerable thickness, so as to answer to the inter-osseous space, one on the out, the other on the inside. This precaution is more particularly necessary when the fracture is in the middle of the fore arm, and if it be near the elbow joint, care must be taken not to put the arm in a sling; it must, on the contrary, be kept extended, for reasons which are very evident.

If instead of falling upon the hand, the person falls upon his elbow, and that the olecranon be not fractured, the inside of the joint may experience a counter-stroke accompanied with symptoms more or less violent, and which may be attended with all those fatal consequences which I have mentioned in describing the effects of counter-strokes in the joints of the lower extremities.

In November 1768, I opened, in a young man of eighteen years of age, an abscess, the origin of which was in the elbow joint, and which had proceeded from a similar cause. The patient had felt great pain at the instant of his fall; a considerable swelling had come on; and when I saw him, on the 17th day after the accident, he had a considerable degree of fever; it was in vain that I bled him twice, and applied anodine and emollient resolute topics to the tumour; it terminated in suppuration, and the fluctuation becoming evident a few days after, I delayed not the opening of it. The pus being mixed with a glairy fluid, and the introduction of my finger into the opening, ascertained the seat of the disease. The patient seemed relieved for some days after the operation; but the bad symptoms soon returned, the fever increased, the discharge became foetid; the edges of the wound were livid and much swelled; the patient was delirious; and during the space nearly of three weeks, he seemed to be in too desperate a situation for us even to be able to attempt amputation with any prospect of success. After this period, however, he grew better by degrees; the symptoms were relieved, and the wound being dressed with dry lint, was perfectly healed, without there having been any apparent exfoliation; there were even hopes, when the patient went out of the hospital, that the joint would still retain a certain freedom of motion.

It seldom happens that mischiefs are produced in the joints, unless in those cases where the shock is not considerable enough to occasion a fracture; but let us suppose, that in a fall upon the elbow, the shock should be sufficient to produce a solution of continuity in the bone; it will either be the olecranon, or the upper part of the fore arm, which will yield to
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the immediate application of the force upon them; or else these parts will resist, and the os brachii will be fractured by a counter-stroke, as it frequently happens. The os brachii will either be broken in its body, and then the curative intentions are too well known to be mentioned here, or else this bone may be fractured at its upper extremity, or its neck, and in that case we must take such precautions as the seat of the fracture requires. Though the curative indications be the same as in all other fractures, yet the mode of fulfilling them is different. As it is impossible to surround the fractured part with a circular roller, after having put the bones into a proper situation, we must apply under the upper part of the arm, two thin compresses which must cross each other on the fore part of the shoulder, while the axilla and the inside of the arm must be defended with tow or lint, previously steeped, as well as the above-mentioned compresses, in a mixture of oil of roses, the yolks of eggs, and brandy^(u). The arm must afterwards be brought close to the trunk, while any hollows there may be between the arm and the trunk, either at the fore or the back part, must be filled up with lint or tow, which is also to be put round the upper part of the arm and the shoulder, and the arm is then to be kept in the situation in which it has been placed, by the circular turns of a roller passed round the body and including the arm, and by a bandage somewhat similar to the capeline for the clavicle, taking care only, that the roller should be long enough to make a sufficient number of turns round the body. The arm being thus immoveably fixt to the trunk, and the fore arm put in a sling, nothing can prevent the re-union of the fractured pieces. It is by this very simple method, which is similar to that of M. MOSCATE, that I have cured several fractures of the neck of the os brachii without the least accident. The padding recommended by that able practitioner, is very well calculated to answer the surgeon's intentions in this case: and we may have recourse to it, if we think proper, in preference to any other mode^(w).

But the shock transmitted from the elbow to the os brachii, may leave that bone entire, and make use of it merely as a medium, by which the mischief is conveyed to a greater distance. Thus it is that a fracture of

the process acromion of the scapula, is sometimes produced: the following is an instance of it. In 1769, a man carrying a considerable load upon his left shoulder, having fallen upon the right elbow, or rather upon the upper part of the fore arm, while bent at right angles with the upper arm; the head of the os brachii was driven with so much force against the acromion, that the process was fractured, while I perceived only a slight contusion at the part which had received the shock. It does not appear to me, that the mechanism of such a fracture ought to make any alteration in the method of cure which it requires of itself. In whatever manner the cause producing the fracture may have acted, the business is to bring the fractured extremities into exact apposition, and to maintain them in a state of rest, which may allow of the inspissation of the intermediate juice that is to unite them.

This double intention may be fulfilled, by keeping the arm exactly fixed to the trunk, and supporting it in such a manner, that the head of the os brachii shall be constantly kept close to the acromion, the motion of which is afterwards to be restrained, as well as that of the scapula and clavicle, by suitable compresses, and by the capeline of the scapula, which is to be applied, as I have just before mentioned, so as to include the arm in the circular turns which this bandage makes round the body; the cure will be the more complete in proportion as the motion of all these parts shall have been more confined. For this reason, in order more effectually to answer this essential indication, we must fill up, with lint or cotton dipt in the mixture above mentioned, all the hollows on the fore part of the arm, above and below the clavicle, &c. and this before we apply the roller. These were nearly the modes of proceeding I adopted in the case just mentioned, and which succeeded so well, that the patient enjoyed, a few months after, a greater freedom of motion than I expected, considering what authors have said of this fracture.

But supposing that the direction of a violent shock should be such, that the os brachii shall not suffer any fracture either in its body, or at its neck, and that it shall not be driven against the acromion, the shock is

then conveyed almost entirely to the inside of the joint, where it may produce accidents proportioned to its violence. An acute pain, a swelling more or less considerable, with inflammation, subsequent abscesses, and a caries of the bones, are sometimes the effect of such a shock. In July 1765, a man fell from a horse, and pitched upon his right shoulder; the pain, which was at first rather acute, was relieved by two bleedings, and by resolute applications; but it was not completely removed; some particular motions were always painful, and the pain increased upon change of weather; this the patient attributed to the rheumatism, to which he had been subject for many years, and which he imagined to be fixed upon this part. Eight months having elapsed in this situation, he was seized in March 1766, with a high fever, for which he was bled four times. A week afterwards, the fever having still continued with violence, he felt in the right shoulder, a pain more considerable than usual, with a difficulty of motion which he had not yet experienced, and a tumour appeared, which was considered as the crisis of the disease. The swelling grew larger, and the pain, which increased notwithstanding the application of anodines, did not seem to give way, till it might be presumed that a suppuration was formed. The collection of matter not being, however, evident to the touch, anodine and suppurating topics were still continued for more than three weeks. The fluctuation being then apparent, an abscess was opened on the lateral, outward, and upper part of the arm, which furnished a very great quantity of well-conditioned pus. It was thought that the patient was saved by this evacuation, because this was supposed to be only a critical abscess; but we were soon undeceived; the fever did not give way, the abscess still furnished a great quantity of matter, and some small particles of bone were found at intervals in the discharge. This unfortunate discovery rendered the nature of the malady no longer doubtful, any more than the imminent danger in which the patient was; notwithstanding all the care that could be taken of him, he fell into a hectic, which increased by degrees, and destroyed him in three months after the opening of the abscess. Upon examining the shoulder joint, I found the head of the os brachii, and that of the scapula, affected with a deep caries.

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Might I be allowed to hazard some conjectures upon this disease, I should say, it is to be presumed, that the fever which came on, was independent of the effects of the shock on the joint, seeing that it preceded, several days, the pain and the swelling of the part^(*); but it may also be imagined, that without the previous mischiefs in the joint, the fever would not have occasioned those appearances which I observed after the death of the patient. Still it is certain, that in the first instance, we cannot carry too far the precautions which ought to be taken after violent shocks in the joints: it is right to recal to our memory, and to that of others, that in these cases, we are not to suffer patients to remain in that state of confident security, which they derive from being assured, that they have neither a dislocation nor a fracture.

In continuing to trace the effects of counter-strokes upon the bones that compose the upper extremities, we find, that the last of the pieces that concur in this structure, in ascending from below upwards, is as much, and even more, exposed to them than any other; this is so certain, that there are very few fractures of the clavicle that are the consequence of an immediate stroke upon this bone; sometimes it is occasioned by a fall on the elbow; sometimes by a fall or a blow on the shoulder, or on the scapula. I have seen several instances of fractures of the clavicle, that have happened in all these different ways. The mechanism of them is so simple, that it is unnecessary to explain it. Neither shall I give an account of any of the cases, because they would contain nothing but trivial observations, little calculated to appear before the respectable body who are my judges; nor shall I mention any thing of the mode of cure, which is sufficiently known, and requires, besides, no alteration respecting the cause producing the fracture: I shall only recommend Mr. BRASDOR's bandage, as preferable to every other method of keeping the shoulders constantly back.

We shall conclude this section by observing, that if it be sufficient, in order to class any injury among the effects of counter-strokes, that it should have taken place in a part distant from that which received the stroke,

stroke, the effects of counter-strokes on the external parts will be considerably increased; for in this general acceptation, dislocations are always produced by this cause. We cannot doubt of this, when we see that a dislocation of the thigh is almost always the result of a shock, of a resistance, or of a power applied towards the lower extremity of that bone; the same may be said of a luxation of the wrist, of the elbow, of the shoulder, of the clavicle, of the lower jaw, of the leg, &c. The bone always receives the stroke either at the extremity opposite to that which is dislocated, or in its body: there are even few instances where the shock applied immediately to the joint, could possibly produce the kinds of accidents we have been speaking of⁽⁷⁾. In making this observation, I do not mean to explain the mechanism by which dislocations are produced; this is a point which it was impossible ever to mistake; we only give the name of counter-stroke to this mechanism, without making any addition to the well-known theory of these accidents; nor does this bring any improvement in the mode of treatment required for luxations. It is well known what proceedings are to be adopted in all cases of this kind, either to accomplish the reduction of the dislocation, to maintain the parts reduced in their situation, or to relieve the present and counteract future mischiefs. All these points of doctrine have been discussed by the most able practitioners; and I cannot suppose it to be the wish of the Academy that we should take a review of all kinds of luxations, because they are effects of counter-strokes, if even we had any interesting observations to offer upon some of these injuries. What is here said of dislocations, I also say of a wrench, and of a diastasis, which are likewise the effect of counter-strokes, since the mischief is not done to the part that receives the stroke. With respect to the treatment of these complaints, we have nothing to propose which is not already known. Repeated bleedings, resolute, emollient, and sometimes spirituous applications, retentive bandages, and above all things, absolute rest, are the means to be preferred in all such cases; and I only mention them here, that I may not be supposed to have overlooked this part of the effects of counter-strokes.

P A R T II.

TO EXPLAIN THE EFFECTS OF COUNTER-STROKES UPON THE SEVERAL VISCERA CONTAINED IN THE CAVITIES OF THE HUMAN BODY, EXCLUSIVE OF THE CRANIUM; AND TO POINT OUT THE TREATMENT THAT MIGHT BE EMPLOYED MOST SUCCESSFULLY AGAINST THE MISCHIEFS THAT ARE PRODUCED BY THEM.

DAILY experience too evidently proves, that very ferious accidents are often the effect of a commotion, or violent concussion, which the principal viscera of the human body experience, after a shock given to a part which is often at a great distance from the cavity containing these viscera. This kind of injury is not confined to that viscus only which is placed within the cranium. The viscera that are inclosed within the thorax and the abdomen, are also exposed to it, although most of the precautions taken by nature to avoid the too great commotion which the brain might experience in cases of leaps, or falls, are common to the other viscera. We shall, however, observe, and indeed it cannot be

otherwise, that in the most ordinary instances of falls, the viscera of the thorax are less exposed to the effects of counter-strokes, than those which are contained in the pelvis. This is the consequence, both of the multiplicity of parts, calculated to absorb motion, which are found between the feet and the chest, and of the power which the chest has of being extended still farther downwards, when the motion of the pelvis is already stopped. In this, as in the first part, we find the division ready marked out, and we adopt it the more willingly, as it is very natural, and well calculated completely to illustrate the last part of the question we have to treat of. We shall therefore begin by explaining the effects of counter-strokes upon the viscera contained in the abdomen, and shall conclude this essay by examining these effects upon the organs inclosed in the cavity of the chest.

SECTION

S E C T I O N I.

TO EXPLAIN THE EFFECTS OF COUNTER-STROKES UPON THE SEVERAL VISCERA CONTAINED IN THE CAVITY OF THE ABDOMEN, AND TO POINT OUT THE MODES OF CURE BEST ADAPTED TO RESIST THEIR CONSEQUENCES.

IT is sufficiently evident, that the sudden stoppage of motion of the pelvis, in instances of falls or leaps, must give rise to a shock, or commotion in the viscera of the abdomen, so much the more violent, as the shock shall have been greater, and as the several bony pieces, by means of which the shock is transmitted, shall have escaped being fractured; it is the same as in a concussion of the brain, which is never more considerable after a violent shock, than where there is no fracture in the bones of the cranium.

It must, however, be acknowledged, that the shocks which the viscera of the abdomen may experience, in case of leaps, falls &c. scarcely produce any mischief in them, except when these viscera are in an un-

natural, or at least, not an ordinary state. At any rate, the injuries they may be exposed to in these instances themselves, are always the effect of counter-strokes, taken in the most extensive sense. Thus it is, that abortion and its consequences may be considered as the effect of such a cause. The most trifling fall, or a false step, are sometimes sufficient to produce it, because, in these circumstances, the motion of the pelvis being already stopped, while the placenta, fixed to the uterus, still tends to move downwards with the velocity acquired by the fall, an effort is made upon that part of the womb to which it is fixed, which would separate it much more frequently than we observe this to happen, if it experienced any resistance from the womb, or if the uterus had not nearly the same tendency downwards as that spongy body has. But this circumstance, so favourable in preventing its separation in ordinary and habitual motions, becomes insufficient when the pelvis suffers shocks of any violence: the divulsion of the placenta becomes then almost a necessary consequence, notwithstanding the power which the fundus of the uterus has to follow its motion downwards, and notwithstanding the presence of the waters, which take off so considerably from the weight of the placenta itself. We know in what manner the separation of this organ, when begun in one spot, extends itself by means of the fluid, which issuing from the small ruptured fibres, is extravasated between the placenta and the sides of the uterus; we know how the flux of the blood is brought on, and lastly, how the pains which come on, give rise to premature labour. With respect to the proper means of preventing this alarming accident, every surgeon is acquainted with them. Bleeding, rest, and diet, are the remedies best adapted to the complaint, and they sometimes succeed; the most complete rest especially, is absolutely necessary. This is at least all that can be done by art, under such circumstances. It is by the same mechanism, that a fall, upon the feet, or upon the knees, a leap, &c. may produce a recent hernia, or force down an old one, and thus become the distant cause of all the mischiefs that may ensue. It is by the same mechanism that a schirrous testicle, which is not supported by a suspensory, in the shocks which are the consequence of the fall, may occasion a dragging down of the cord, and excite a pain in it which may be communicated to the testicle

ticle itself, and occasion the schirrus to degenerate into a cancer. Thus it is too, that a counter-stroke, taken in the most extensive sense, may occasion pain in a womb that is swelled and inclined to become scirrhus, which may change the nature of this termination into a worse. Even in instances where this viscus is not in a diseased state, it may give rise to hæmorrhages very difficult of cure. Are we not also to consider as the result of the kind of cause, the effects of which we are investigating, to those pains, which, after a fall, were felt in the abdomen of a woman, who, for some years past, had had a schirrus of one of the ovaries; and must we not attribute to the same cause, the fatal alteration which happened, after a similar event, in a tumour of the same sort in the liver? I have seen all these fatal accidents be the result of imprudent leaps, or of falls upon the lower extremities, or the bones of the pelvis.

It is not, however, always necessary, that the effects of counter-strokes should fall on diseased viscera, in order to give rise to disorders which were not previously existing there. I have seen a man who before enjoyed a good state of health, void almost pure blood through the urethra for several days together, and this on account of having fallen astride, from almost the height of two feet, upon a bar of iron. From that time he has always been subject to nephritic colics, and to a frequency of voiding his urine, attended with an habitual discharge of small gravel; disorders to which he was entire stranger before his fall. From whence did this blood proceed; from the bladder, or from the kidneys? In what manner has this counter-stroke been able to produce a hæmorrhage in the urinary channels, and give rise to those habitual nephritic colics which torment the patient? These are questions, the solution of which would be as useful as satisfactory; but I am far from pretending to solve them. It appears to me, however, from the pain which the patient told me he plainly felt at the instant of his fall, about the region of the loins, and from the dull pain which he complains of ever since in that part, that the kidneys may be considered as those of the urinary organs which suffered most by the commotion. The branches of the renal plexus of nerves being vio-

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lently affected at the instant of the shock, may have injured the vascular system so much, as to occasion a hæmorrhage in the internal structure of the organ; or else these nerves might, perhaps, leave the secretory canals in such a state of atony, that in the first instant of the accident the blood might pass into them indiscriminately with the aqueous fluid that was to be secreted in the kidney; and indeed, such a disturbance in the internal organization of this viscus was very likely to encourage the formation of those gravelly concretions which the patient voids with his urine ever since that period. This is now eight months ago, during which time the patient hath been in the habit of taking a quantity of the decoction of marsh-mallows and linseed; a drink which may possibly have contributed to keep up his tendency to a nephritic colic. The good effects he finds from saponaceous and balsamic astringent remedies, the use of which he has continued for some days past, would seem to confirm my conjectures.

The following case affords also a very striking instance of the effect of counter-strokes, which, though trifling, yet from being often repeated, have given rise to fatal disorders. A tradesman, little accustomed to go on horse-back, having rid six and thirty miles at full trot, upon a bad hackney horse, found himself overcome with fatigue. On his return, he vomited, and was seized with a pain in the epigastric region, which he thought rest would remove. It continued, however, with a degree of violence for some days, during which time, he would not submit to lose blood, although he had some fever, and vomited whenever he took any solid food; nor did he even observe the absolute rest that had been enjoined to him. The pain being somewhat abated, and the vomitings returning at intervals only, he took little notice of his complaint for some time; but the pain still subsisting, and the vomitings having never left him entirely, he began to grow uneasy, and had recourse to remedies which were not well adapted to his case; an emetic was administered to him twice; and he was ordered to take wormwood wine. The complaint, far from diminishing, increased; the vomitings became more frequent; and after having lived two years, trying a variety of medicines, the patient was

was reduced to such a state, that his stomach would retain nothing but liquids; and these he at length became unable to pass, for they were thrown up again in large quantities, after having remained sometimes two or three days in the stomach. The patient fell at length into a marasmus, and died in an astonishing state of emaciation. Upon opening the body, I found the liver very hard, without being much increased in size; the pancreas was schirrhous at that part of it which is next to the duodenum; and this intestine, partaking of the disease of the pancreas, was almost entirely obliterated; the stomach was exceedingly large, and the intestines were scarce bigger than those of a chicken.

Besides all the pernicious effects of counter-strokes upon the principal viscera of the abdomen, how frequently has not this kind of cause given rise to a mortal commotion in the spinal marrow? There are few practitioners who cannot produce some instance of a palsy in the lower extremities, coming on in consequence of a fall, without either dislocation or fracture of the lumbar vertebræ. A girl of seven years of age, walking in a waxed room, having fallen backwards, was unable to rise again. Being lifted up and put to bed, she was examined; and although none of the bones that compose the spine were found injured or displaced, yet the lower extremities had lost all power of motion. The father having refused to suffer his child to be bled in the first instance, the parts were only rubbed with warm cloths, and fumigated with various aromatics, while vulnerary remedies were internally administered. Notwithstanding these assistances, and bleeding, which was afterwards performed, the parts never recovered their power of motion; and the girl lived only between two and three months after the fall. We could not obtain leave to open the body; but it is very certain, that there was no appearance externally, which indicated any kind of injury done to the bones.

With respect to the proper mode of treatment in the several cases which we have been speaking of, it may be observed, that the symptoms which are or may be the result of counter-strokes, the effects of which
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are felt either in the principal viscera of the abdomen, or in the lower part of the spinal marrow, seem to indicate, that the curative intentions to be pursued, must be nearly the same, whatever may be the nature of the parts suffering the mischief. Accordingly, in the several instances we have been mentioning, bleeding, rest, and strict diet, are the chief remedies to be employed.

SECTION

S E C T I O N II.

TO EXPLAIN THE EFFECTS OF COUNTER-STROKES ON THE
VISCERA CONTAINED IN THE CAVITY OF THE CHEST, AND
THE MODE OF TREATING THEM.

ALTHOUGH, in cases of leaps, and falls upon the feet, or on the
nates, the effects of counter-strokes, for the reasons before mentioned,
can seldom be conveyed to the viscera contained in the cavity of the tho-
rax, so as to disturb the functions of these viscera; it is not however an
uncommon thing to find, that the kind of motion communicated to the
chest in this way, produces evident mischief in the lungs; but it must be
acknowledged, that this happens more particularly, when there is some
disease in this organ. Accordingly, it may readily be conceived, that if
the lungs be affected with tubercles, if they be partly schirrous, or have
recently contracted adhesions in consequence of inflammation, the com-
motion they would experience, in case of any fall, might give occasion to
dangerous divulsions, to rupture of vessels, and to an hæmoptoe. Thus it
is that I have seen the mere shaking of a horse, hasten the death of per-

sons whose lungs were much affected with tubercles. It must not, however, be imagined, that the lungs, though free from the diseased state above-mentioned, should still be entirely sheltered from the effects of counter-strokes in cases of leaps or falls upon the lower extremities. I have seen persons, without any tendency to disorder in the lungs, seized with a spitting of blood, after such falls, and incur all the dangers of an hæmoptoe. I have known others complain of a painful dragging sensation between the two shoulders, at the place where the lungs are more particularly attached to the spinal column; which was certainly owing to a divulsion of the connections that fix this rather weighty viscus to that part. I have also seen instances of persons, who having fallen upon their heels, from the height of about two or three feet only, have been seized with fainting fits to an extreme degree. This symptom may possibly be considered as the effect of a violent commotion, which the heart may have experienced at the time of the shock. I am, however, more inclined to think, that these faintings, among which I have seen an instance of their returning for three weeks together, every time that the trunk was thrown into a vertical position, are the effect of a concussion of the brain, a disease which is not the object of our present enquiry; but the viscera of the thorax may experience injurious concussions, by other means beside that of a fall on the feet, or a leap from a certain height. Every blow received externally upon the parts which form the cavity, may occasion considerable injuries in these viscera, even when the bony compages that surrounds them, shall remain unhurt. In this case, the heart cannot always avoid the effects of such counter-strokes. We know the kinds of mischief which may happen, by this way, to these important viscera, and the curative means to be employed against them; the same may be said of the contusion which the liver may receive from a violent blow on the false ribs. Repeated bleedings, a strict diet, diluting liquors, and resolute spirituous applications, are almost the only remedies to be used in these cases. I have undoubtedly said enough to prove the danger of very violent shocks, even when they fall upon parts of a more compact texture than the brain, and to explain the wisdom and foresight which nature has displayed, in arranging the contrivances

vances destined to avoid or to diminish the effects of these concussions. It remains only, to finish this essay, that I should give a summary recapitulation of the effects of counter-strokes, considered either in their limited, or their most extensive sense; and to explain the principal curative intentions best adapted to the several kinds of mischiefs that may result from them.

From what has been hitherto said, we see how many different diseases may be referred to one single cause; and how various and numerous are the effects of counter-strokes. It is not therefore, without foundation, that, at the beginning of this essay, I declared, that the most serious disorders of surgery, and I might have added, of medicine, arose from a similar cause. All dislocations, wrenches, every diastasis, all contusions in the joints of the extremities, disjunctions of the sacrum, divulsion of the ligaments that connect it, and several of the injuries that happen to the pieces that constitute the spine, are they not the effects of counter-strokes? Are not most fractures accomplished by the same mechanism, as well as most abortions, descents of the uterus, and herniæ? Doth not this cause frequently make schirrous tumours degenerate into cancers, or produce the same effect on other swellings of a similar tendency? Have not counter-strokes often given rise to evident mischiefs in the important organs of the abdomen and thorax, when they were in a distempered state, and sometimes when they were sound? The most serious disorders of the brain, which we have not noticed, on account of the limits prescribed by the Academy, are they not the result of counter-strokes? How many subordinate accidents afterwards succeed all these original disorders which we have enumerated? From all these circumstances, it cannot be doubted, but that counter-strokes are among the most general causes of the disorders to which our frail machine is subject.

But notwithstanding the multiplicity and variety of the original accidents which are derived from this single cause, we observe, with satisfaction, that the intentions of cure to be followed in order to counteract these effects, whatever they may be, are always nearly the same, when

the injury hath happened in the viscera contained in the several cavities, the brain itself not excepted. Accordingly, we find, that in all these cases, repeated bleedings, perfect rest, and strict diet, are the remedies to be preferred⁽²⁾. External applications in cases where they can be employed, are only accessory remedies, which however are not to be neglected; they must only be varied according to circumstances. Sometimes they are only to be such as to defend the parts, at other times, resolutive spirituous topics are to be applied; sometimes emollient, relaxing and anodine remedies; sometimes saponaceous, balsamic, astringent aromatics, tonics, and artificial pumping upon the part, with natural or artificial medicinal waters, &c. These are all subordinate methods, to which we are sometimes the more obliged to have recourse, the more we have neglected, in the first instance, the principal modes of cure which we have treated of.

A subject so difficult, and so extensive, required more genius to be well understood, more talents and knowledge to be treated to the satisfaction of the Academy. I have at least exerted my best endeavours to fulfill the conditions of the thesis; and can only judge of my efforts, without being answerable for the success of them; nor shall I think my labours useless, if they can only intitle me to some attention from those who are to decide upon them.

NOTES

AUTHOR'S NOTES

ON

COUNTER-STROKES.

(a) I DO not mean to say, that writers have been entirely ignorant of this kind of cause, although they have not mentioned it under the specific term of counter-stroke ; much less do I assert, that their practice has never been directed according to the mechanism, by which the complaints they observed, had been produced. This would be to allow neither reflection nor genius to our predecessors. I imagine only, that in many cases, their attention has been rather engaged in discovering the nature of the accident, than in reflecting upon the several ways in which it might have been produced.

(b) We must here make an allowance, for the loss of the power of motion, by communication.

(c) This is the case of the cable that is veered away, for a certain time, in order to stop the boat gradually. If the head bore upon an inflexible column, its motion, in falling upon the feet, would be stopped, at the very instant that the feet came to the ground ; while the soft viscous
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contained in the cavity of the cranium, would continue to strike against the basis of this cavity, with all the force that would have been imparted to it, by the velocity it would have acquired in the fall. This would produce, in the organization of this important viscus, a disturbance of the same kind as that which was observed in the brain of a criminal, who, running from a few paces back, dashed his head against the wall of his prison. But the cartilages which line all the joints, those which unite the vertebræ with each other, and especially the various inflexions of the body in falls upon the feet, are the cause that the head, coming near the ground when these parts are already at rest, can only lose its motion in a gradual and imperceptible manner.

(d) I have seen patients, cured of a fracture of the fibula, remaining a long time unable to walk without crutches.

(e) This was the third death I had seen happen at the same period, and with the same symptoms, after compound fractures of the legs which had been well reduced; this circumstance led me to reflect. I inquired for the limb, and examined the state of the tibia; the marrow contained in the cylinder of this bone, was somewhat in a state of dissolution towards the fractured extremities, and the smell of it was putrid in the highest degree. This circumstance made me imagine, that a portion of the putrid miasmata produced by the dissolution of the marrow, having been absorbed, had occasioned a true nervous disease; and in consequence of this idea, I determined to adopt some other mode of proceeding in the first case of the kind which my practice might furnish me with. The opportunity soon presented itself; when, instead of putting the two ends of the tibia in exact apposition, I placed them in such a manner, that by means of their situation, and of a detached piece of bone which I took away, I could conveniently throw into the cavity of the bone any injection I might think proper; so that I treated this case as every compound fracture is treated, with the additional precaution only, of injecting upwards and downwards into the cavity of the bone, at every dressing. By this contrivance, my patient was exempt from any of those symptoms which had
successively

ſucceſſively deſtroyed three others whom I had attended; and recovered with only a very trifling deformity of the leg. I wait for other opportunities of verifying theſe conjectures, in order to ſend to the Academy an eſſay upon a point of doctrine which ſeems to be new.

(*f*) Miſchiefs nearly of the kind, may very poſſibly be the reſult of a violent commotion which the marrow of the bone may have ſuffered in a fall, or a ſtroke upon the part; and in that caſe, they would ſtill be the effects of a counter-ſtroke upon a ſoft part.

(*g*) I have had ſeveral inſtances of ſimilar internal exfoliations; and not long ago, I extracted one of three inches from the inſide of the tibia, but the diſeaſe had not been the reſult of any violence.

(*b*) Probably the fall on the knees, in this inſtance, had cauſed a fracture of the thigh ſo near the joint, only on account of the woman having an old ſub-luxation of the leg, ſo that there was a deformity in the part, which gave an oblique direction to the ſhock.

(*i*) The cotyloide cavity preſenting an oval cup, the great diameter of which, is from above downwards, admits, by this contrivance, of this gliding, which contributes to deſtroy the motion by degrees.

(*k*) See Mr. PETIT's treatiſe on the diſeaſes of the bones.

(*l*) No man can have a greater veneration for the memory of the celebrated Mr. PETIT than I have; nor can entertain a more profound reſpect for the opinions of this great man: but I have never had reaſon to be ſatiſfied with the large inciſions recommended by him, in certain caſes, to empty collections of matter in the joints; perhaps my practice may not yet have been ſufficiently extenſive, or perhaps I may not have employed theſe inciſions in the proper caſes.

(*m*) If

(m) If we recollect the manner in which the spine bears upon the sacrum, and that this bone is inclined backwards, we shall see, that as the center of gravity of the upper parts, passes only through the basis of the os sacrum, the weight of these parts must necessarily tend to push this basis downwards and forwards, and consequently to raise the point of the os coccygis backwards.

(n) Perhaps too these accidents were only the consequence of the contusion of the cartilages.

(o) It must be acknowledged, however, that the unfavourable state of the woman, and the diffusion of the milky secretion were auxiliary causes, without which, the external cause might possibly have produced no mischief.

(p) Histoire de l' Académie, tom. iv. page 19.

(q) The divulsion and extension of the ligaments connecting these bones, sometimes concurs powerfully in producing these mischiefs; but it must be acknowledged, that they may be the result, of the mere contusion or sinking in of the bony substance of the last vertebræ of the loins, or of the os sacrum, without extension or divulsion of the ligaments which strengthen their connection with each other.

(r) It is taken for granted, that in cases of apparent displacing of the bones, all the means, proper to bring about the reduction or natural conformation of the parts, have been tried.

(s) A fracture is often the only effectual mode of preservation, that nature could have adopted under certain circumstances.

(t) Nothing can be added to what the celebrated Mr. PETIT says, in his work upon the diseases of the bones, concerning the treatment proper for these complaints.

(u) I never

(*u*) I never saw any erysipelas after the application of this mixture.

(*w*) See his essay upon this subject, in the fourth volume 4to, of the Memoirs of the Royal Academy of Surgery at Paris, page 614.

(*x*) It might, however, be possible, that a carious spot in the bone, assisted with a depravation of the fluids, might have given rise to the fever and other symptoms, which appeared to be the consequence of it.

(*y*) I desire it may be remembered, that in the first instance, I have classed among the effects of counter-strokes taken in the most confined sense, such injuries only as might be produced by the immediate application of a shock upon the part, where the disorder is seated; from whence it follows, that dislocations not being included in this class, it appears to me, that they should only be considered as the effects of counter-strokes, taken in the most extensive sense.

(*z*) It is taken for granted, that in cases of dislocation or fracture, the parts have been previously reduced.

ON CONJUGATE FUNCTIONS

(1) Let $f(z)$ be a function of the complex variable $z = x + iy$ which is analytic in a domain D . Then the function $\bar{f}(\bar{z})$ is also analytic in D . This is evident from the fact that if $f(z)$ is analytic, then it satisfies the Cauchy-Riemann equations. If $f(z) = u(x, y) + iv(x, y)$, then $\bar{f}(\bar{z}) = u(x, y) - iv(x, y)$. The Cauchy-Riemann equations for $\bar{f}(\bar{z})$ are satisfied if and only if the Cauchy-Riemann equations for $f(z)$ are satisfied. Hence $\bar{f}(\bar{z})$ is analytic in D .

(2) Let $f(z)$ be a function of the complex variable $z = x + iy$ which is analytic in a domain D . Then the function $f(\bar{z})$ is also analytic in D . This is evident from the fact that if $f(z)$ is analytic, then it satisfies the Cauchy-Riemann equations. If $f(z) = u(x, y) + iv(x, y)$, then $f(\bar{z}) = u(x, y) + iv(x, y)$. The Cauchy-Riemann equations for $f(\bar{z})$ are satisfied if and only if the Cauchy-Riemann equations for $f(z)$ are satisfied. Hence $f(\bar{z})$ is analytic in D .

(3) Let $f(z)$ be a function of the complex variable $z = x + iy$ which is analytic in a domain D . Then the function $f(\bar{z})$ is also analytic in D . This is evident from the fact that if $f(z)$ is analytic, then it satisfies the Cauchy-Riemann equations. If $f(z) = u(x, y) + iv(x, y)$, then $f(\bar{z}) = u(x, y) + iv(x, y)$. The Cauchy-Riemann equations for $f(\bar{z})$ are satisfied if and only if the Cauchy-Riemann equations for $f(z)$ are satisfied. Hence $f(\bar{z})$ is analytic in D .

V.

ON THE

T R E A T M E N T

OF

CANCEROUS DISEASES.

10

ON THE

TREATMENT OF

BY

CANCER OF THE

ON THE

M E T H O D S

PURSUED IN THE TREATMENT OF

CANCEROUS AND SCHIRROUS DISORDERS, &c.

IN giving this account, the following order will be observed. I shall first speak of ulcerated cancers, and the various applications I have used to them ; under which head will be included the treatment of cancers of the womb.

The second part will be taken up in the consideration of schirrous tumours, in which will be inserted those cases that were merely schirrous tumours, or occult cancers, when they first came under my notice, and which afterwards became ulcerated.

The third part will contain observations on what is commonly called the milk breast, or the coagulation of milk, and the consequent formation

tion of matter in the breasts of women after lying-in, with the account of a peculiar method of treating these complaints.

It would be tiresome and unnecessary to give a description of every case that has been under my care; my design being only to make a full communication of every external application I have used, and of every internal medicine I have given, with the general result of the effects; and to note the peculiar observations which experience has led me to make, in the number of these cases that have fallen under my notice. Those cases therefore shall be selected in which the methods have been varied; or the detail of which may appear to afford some lights that may possibly be of advantage to others.

But as I am convinced, that more useful information is frequently to be derived from a candid avowal of our errors, than from the display of our best successes, I shall be particularly careful not to omit any instance, in which I could have the least suspicion of any fatal or dangerous symptom having arisen, from the properties of any application or medicine employed. This may at least save other practitioners the time and trouble of pursuing the same track; and if it cannot tell us what to do, will at least teach us what we are to avoid: a knowledge, in many cases, and particularly in desperate ones, next in utility to the former. I shall only observe, that the instances in which such accidents have happened, are extremely few in comparison of the great number of patients with whom the same methods have been followed.

In the year 1770, a lady applied to me with a cancerous complaint of a very malignant nature. She had been afflicted with it upwards of thirteen years. It had originally consisted of two schirrous tumours, which had been removed about three years before she applied to me, by Mr. Guy's method. That gentleman was never able to close the wound entirely; and though the lady remained tolerably well for some time after the removal of the tumours, yet there was a little crack subsisting which furnished occasionally a greater or less quantity of discharge. Mr. Guy
dying

dying some time after this, and the patient growing worse, she applied to his son from whom she received no benefit. She afterwards shewed the part to several eminent surgeons, who all advised her to do nothing to it, except to keep the wound clean. When I first saw her, the appearances were as follow. One large, oblong, pale, ill-conditioned, sloughy wound in the middle, extending nearly throughout the whole of the scar formed by the previous application of Mr. Guy's caustic. This wound surrounded by several smaller, some near, some at a distance from the larger one, and all discharging an ichorous acrimonious fluid, which frequently inflamed and excoriated the parts on which it fell, and thus produced other wounds. The edges of the wounds were tucked in, and those of the large one in particular, were extremely indurated. From the most external border of the large wound there arose a kind of cord of considerable hardness and bulk, which extended quite into the armpit, occasioned pain, and sometimes a degree of swelling in the arm on that side, and rendered the operation impracticable. Mr. Falwasser, surgeon and apothecary at Maidenhead, and Mr. Yatman, apothecary in Percy-street, Rathbone-place, were both witnesses of the case and the result of it.

This I considered as a fair case to make trial of the hemlock bath, which I was induced to do from an account of its success that I had met with some years before written in the German language, and which I translated and published in London a short time after my return from that country. I had already recommended this bath to some poor persons who applied to me in the course of a few years with cancerous complaints; but though I offered to defray the expences of the apparatus and of the plant for them, yet I could induce very few to try it; and those who did use it two or three times, could not be prevailed upon to continue it long enough to find any effect from it; alledging, that it was a method too troublesome for them and their families. On the other hand, the hemlock was fallen into such general discredit among the faculty in England, and they were so particularly prejudiced against any thing that had the name of coming from Germany, that I could not prevail upon any
of

of my medical friends to try this new mode of introducing it into the habit.

I resolved however not to propose this bath to my patient at first, in order not to alarm her; but to give a fair trial to the internal use of the extract of hemlock, and the external application of the plant in poultices and fomentations. She persisted for a long time, and the dose of the extract was gradually increased as far as it could be borne, but without any visible effect, except a trifling alteration for the better upon the first trial of it, or upon the first varying of these applications for some other. A year and a half or more passed away in this manner, during which time she tried the extract of hemlock, the bark, the sublimate, the carrot poultice, and many other things without obtaining any relief. On the contrary, she grew visibly worse. Long continuance of excruciating pain had reduced her to an extreme degree of weakness and emaciation. Her countenance was become quite livid. The disease was much advanced in its progress, both with respect to the number and condition of the sores, and the extent and size of the indurations. Such, in a word, was her state in the month of December, 1771, that her family justly apprehended it would not be long before they should be deprived of a valuable relation and friend.

I had frequently taken the opportunity of endeavouring to persuade my patient to try the hemlock bath, but all my expostulations to this purpose were unavailing; so that chagrined at the inefficacy of all the methods pursued, I had lately been revolving in my mind a design of trying the outward application of salt ammoniac, which I had always considered as a substance of powerful resolute properties, and of course as a very useful topic in all indurations. I could not however readily determine upon the mode of using it in these cases, and in this dilemma communicated my ideas to Doctor Morris, in hopes that his well-known abilities in chemistry might assist me in settling this point. Upon my mentioning the salt ammoniac to him, he informed me that there was an account just published in one of the German Ephemerides, of a chymical preparation,
used

used with success in cancerous cases, in which that medicine was a principal ingredient. I procured the account, and found that the medicine was a tincture of equal parts of salt ammoniac and iron in rectified spirit of wine, with the addition of oil of vitriol, and oil of tartar, and directions were given for applying it. The exact mode of preparing it shall be mentioned at the end of this section. At present let it suffice to say, that I resolved to try it, and accordingly desired the favour of Doctor Morris to prepare it for me.

The liquid being ready, I began using it, as directed, in the following manner. I dipped a small pencil brush into it, and smeared all the edges of the sores, and every part that was indurated with it, taking all possible care that the liquid should not run down into the ulcers themselves. The part besmeared was then suffered to dry; the wounds were covered with dry lint, and the edges with the same. It being scarce possible to prevent some of the liquid, which was extremely sharp, from insinuating itself into the sores, there was generally a degree of smart accompanying the dressing, but this soon subsided. My patient was directed to repeat this application of the liquid to the edges, and to all the indurated parts two or three times a day, or as often as she could bear it. Finding in a little while that there was a visible alteration for the better, I ventured to use the liquid more freely, and after having smeared all the indurated parts as before, dipt in it some pieces of lint or rag doubled, and layed them wet all over the edges and indurations. By this contrivance the liquid remained active upon the parts for a much more considerable space of time, and the patient had nothing more to do, than with the pencil brush to soak the lint again as often as it became dry, or as she could support the smart. When it appeared that the liquid produced an alteration in the edges and indurated parts, I resolved to wash the ulcers themselves with it, lowering it for this purpose with water, and trying the mixture upon my tongue, till I judged that it was sufficiently mild. When it happened that the edges were inflamed or excoriated by the frequent use of this sharp liquid, it was suspended till they were recovered, which they generally were in four and twenty hours. In this manner I

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proceeded

proceeded for about three months, at the expiration of which time the pain of the disease was less, the edges and indurations began to soften, and the discharge from the fores was meliorated.

Notwithstanding these favourable appearances, I observed with much chagrin, that although my patient being freer from pain, was rather better in health, than when this process was first entered upon, yet the amendment in this particular was not nearly so evident as in the others. This was a material circumstance to attend to. But in what manner was this amendment to be brought about? All the ordinary remedies given as alteratives, or with an intent to restore the exhausted strength of the body, had been already administered in vain. Reflecting then upon the good effects produced by the liquid applied externally, it seemed probable to me, that a medicine of a similar nature might be given internally with some prospect of success. The flores martiales occurred as the preparation the nearest to it, and I was the more induced to try it in this instance from considering the invigorating power of the iron contained in it. Accordingly, it was made up into pills with a solution of gum arabic, each pill containing three grains of the medicine, of which the patient took at first two in the day. Five grains of the flores martiales were soon after put into each pill, and the dose gradually increased, till twelve of these last pills were taken in the course of the day. When this method had been continued six weeks, my patient's health was visibly mended, her complexion cleared, and her strength much recovered. Encouraged by these promising appearances, and finding that the medicine did not disagree, the dose of the martial flowers was increased to ten grains in each pill, of which pills from twelve to twenty were taken in the day. The only inconvenience ever experienced from this, was a little sickness at stomach now and then, which was easily removed by a tea spoonful of brandy, or some warm wine, and which might perhaps be as much owing to the swallowing of a number of pills in the day, as to any effect of the medicine. It is to be observed, that upon an average my patient may be said to have taken between two and three drachms of the martial flowers every day, for a long continuance, without inconvenience. A
few

few of my cancerous patients have since taken from three drachms to half an ounce of the same medicine in the same space of time, and likewise without inconvenience ; though it must be acknowledged, that this medicine, as well as others, can be borne in much larger quantities by some stomachs than others : so that, upon the whole, whether the pills are made with five or ten grains of the medicine, it may be as well to restrain the dose to about two drachms in the day, which from experience I am inclined to think, will not disagree with any patient. And even this is an almost incredible dose, when we consider how seldom this medicine has been prescribed, and when it has, how sparingly.

In the course of this work, we shall have occasion to observe the utility of this enlarged dose of the martial flowers, in a disease very common among women, which frequently baffles all the skill of the physician, and which has been generally considered as one of the principal causes of sterility.

In three or four months after the giving of this medicine, that is, about seven months after the first application of the liquid, my patient was so much mended in every respect, that I began to entertain hopes of effecting a complete cure. The internal use of this invigorating medicine had so far restored her health, that she appeared like a new creature. The pain of the disease was almost entirely subdued, the indurations were all of them considerably softened, and in some places totally resolved. The cord under the arm-pit was much lessened. The large wound was contracted, and some of the small ones closed : the discharge from them was generally good.

But the appearance of the fores was still not so satisfactory to me, as the changes produced in other circumstances ; and I soon grew sensible that there wanted some other application to them. Though some of the small wounds were healed, yet they broke out again, and this fresh ulceration was always attended with pain, and brought on at first an ichorous and acrimonious discharge. The fores in general were now tolerably

clear and free from sloughs, but the surface of them was rather reticulated than granulating; and when touched ever so slightly, their sensibility was so exquisite, that it was evident they were still in a fungous or cancerous state, and not yet disposed to heal properly*. The common caustics had scarce any effect upon them; neither did there appear any permanent advantage from touching them occasionally with the liquid unmixed with water. Encouraged however by the progress already made, and unwilling to have such fair prospects blasted, I resolved to try the effect of arsenic applied to the sores. I was aware that the fatal symptoms brought on by an indiscreet use of this medicine, had induced many eminent and learned men to reprobate it entirely; while others, it must be acknowledged, of equal repute, affirmed that it was of infinite service in cancerous affections. Sensible at the same time that this application would necessarily occasion pain, it was my desire to find out the least painful method of using it. In this view, it occurred to me that if it were possible to make a preparation of it, that should act immediately upon touching the sore as the lunar caustic does, that the pain, however sharp at first, would not be of long duration†. This idea was communicated to Doctor Morris, who was desired, if possible, to make such a preparation. The Doctor told me he had a preparation of arsenic by him, the effect of which he could not take upon him to ascertain, but believed that it would be milder than the crude mineral. It consisted of equal

* I have frequently observed, that this appearance of net-work upon the surface of any sore, argued an uncommon degree of sensibility. Perhaps this may be owing to the denudation of some small nervous filaments, and their being affected by the acrimony of the discharge. The balsamic quality of good pus from a fair wound, may possibly sheath these filaments, and contribute to remove this extreme soreness, which is known always to be an indication of the fungous or morbid state of a wound.

† I was mistaken in this, for I have since had such a preparation made, and am convinced by experience that it cannot be used. The action of the arsenical salts is naturally very painful, though slow; but when they are exalted to their highest degree of activity, the pain they give only by a momentary touch is totally insupportable. They are worse than actual cautery, inasmuch as they seem to be equally acute at the instant, and that the pain continues in all its first violence long after their action has ceased.

parts of arsenic, copper, tin and mercury, distilled in spirit of wine, and afterwards in oil of vitriol. As it was agreed between us, that the action of the arsenical salt would rather be lowered than exalted by this combination and process, I determined to try this preparation. Though I had gathered from reading, as well as general report, that the arsenic must have been used externally in pretty considerable quantities for the cure of cancerous complaints, and that with success, yet I was resolved to proceed with all possible caution in my trial of a medicine, of the effects of which I had not yet been an eye-witness. I therefore reduced the mass Doctor Morris gave me into impalpable powder, took as small a particle of it as I could possibly separate, and laid it on the middle of one of the smallest sores, the size of which did not exceed that of a fixpence. I staid with my patient a considerable time to watch the effect of this first trial, and returned in the evening to inquire what degree of pain she had felt, intending, if it had been violent, or still continued, to prescribe her some opiate to appease it. But although she had felt the action of the medicine, yet the portion of it was so small, that the pain had been very tolerable. When the part was dressed next day, it appeared, that an eschar was produced, which had extended itself beyond the point where the powder had been applied. In order to ascertain the effect of this topic, it was necessary, that the eschar should be made to spread quite over the surface of the sore, and therefore I contrived to bring this about gradually, by a repeated application of the powder in small quantities, sometimes with more, sometimes with less pain. It was my wish to observe what alteration would be made upon this little sore, after the separation of the eschar, before the powder was applied to the other ulcers, that my patient might be preserved from any further unnecessary pain, if it should be found not to succeed in this first trial. The experiment was carried on so slowly, and with so much caution, that a few days elapsed, before the eschar had pervaded the whole surface of the sore. It was soon thrown off, not being deep, and in a few days after this, I had the satisfaction to find the little ulcer perfectly cicatrized. In the mean while it was observed with pleasure, that the case continued mending in every other particular. This course was therefore stedfastly persevered in; the
liquid

liquid was used outwardly to all the indurated parts, the martial flowers were taken inwardly in as large a dose as they could be borne, and the arsenical powder was applied at different intervals to all the sores, in greater or less quantity, as it was judged necessary to make the eschar more or less deep. Some of the ulcers were very obstinate, and it became necessary to renew the application of the powder to them, after the separation of the first, sometimes of the second, and even of the third eschar. It may be presumed that the patient underwent a great deal of pain in the course of this treatment. It must be owned she did; and my attention was chiefly engaged in devising methods to give the least pain it was possible to give, and to alleviate it whenever it rose to any degree of violence. This did not happen often, and when it did, it was found, that the external application of an anodine fomentation composed of twelve poppy heads bruised, and boiled in little more than a quart of water, till reduced to a quart, was much more effectual than the internal use of opium, which at the same time however was not neglected. The warm bath proved also of great service in this particular. By thus steadfastly persevering, success was at length obtained, and in the month of March, 1773, about fifteen months after the first application of the liquid, the wound was compleatly cicatrized. The schirrous parcel under the arm-pit was dissolved, and that in the literal sense of the word, for no wound had been made upon it, no caustic applied to it, and there remained only a slender cord like a thin piece of packthread, which seemed but to indicate where the great hardness had been. The indurated edges were also entirely softened, except the anterior edge of the sore next the sternum, where there was still a knob about the bigness of a large pea. My patient felt not the least pain, and had not felt any for some time past; and her health was so perfectly restored, that she now appeared several years younger than she had done in the year 1771. I would fain have persuaded her to suffer me to make a little wound upon the knob still conspicuous at the anterior edge of the sore, in order to destroy it by the arsenical powder, but the satisfaction of finding herself in a perfect state of health, after having languished so long under such a painful distemper, and the dread of renewing her former pain, prevented her from consent-

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ing to this proposal. She was then advised to continue the application of the liquid to the line under the arm-pit, and to the little knob afore mentioned; upon a presumption that in time these remains of the disease, if they could be called so, would be removed by this precaution; but she was so perfectly satisfied with her present state, that even in this particular she neglected to follow my advice. About six months after the healing of the wound, she sent for me, having scratched the cicatrix with a pin. The scratch bled a little, and was about two inches in length. She was exceedingly alarmed lest this unfortunate accident might destroy the happy effect that had been produced with so much difficulty. Upon examining the part with attention, it appeared however that the small line remaining under the arm-pit at the period of the healing of the wound, though nothing had been done to it, was now entirely dissolved, so that there was not the least trace of the large induration that has been described in this part, and it was even impossible to distinguish where it had formerly been. My patient was desired to take notice of this favourable circumstance, which contributed to quiet her fears, and to convince her that the disease was now so effectually subdued, that the little accident would not be attended with any consequences. No other application was made to the scratch, than some white cerate spread as thinly as possible upon lint; with which we had the satisfaction to find that it healed in a few days..

Such was the case and the event of it, upon which my hopes of having discovered a method of curing cancerous affections, were first founded..

Many of my brethren in the profession saw this case, and although their unanimous opinion was, that it was a very extraordinary one; yet the knob remaining at the anterior edge of the sore, made them conclude in general that the virus was not totally eradicated. Doctor Wathen's expression after having seen it in the year 1776, above three years after the healing of the wound, occurs particularly to me. He said, *it was all but cured*; but so well satisfied was he of the benefit received, that he desired

desired a lady who had come from the country to consult him in a similar complaint, to put herself under my care. I shall not enter into a discussion of this opinion that the cure was not completed, though contrary to mine, but shall state the facts as they happened, and leave my readers to form their own conclusions. It must only be observed, that from the time of the wound being healed, till the middle of the year 1777, that is, near four years and a half, my patient remained free from any kind of complaint in the breast, except a scab which now and then formed on this knob, and fell off of itself. In other respects she was perfectly well, had not any excoriation or discharge from the part, and felt not the least pain: her health too, continued firmly established.

About Whitsuntide, 1777, as she was going into a ship's boat, the board being wet, her foot slipped, and her son, who held her under the arm, raising her up and extending it suddenly, to save her, she immediately felt great pain on the scar of the breast. A few days after this the scar broke out, and there appeared a wound about an inch in length. She complained of a good deal of pain at times, but her health was good, great part of the cicatrix remained entire, and there was not yet the least appearance of that hard thick cord that formerly extended itself towards the arm pit. This was the state of the case about autumn, 1777; I had not an opportunity of attending it after.

The same method was afterwards pursued in some of the other cancerous cases, and though the first changes produced were satisfactory, yet the event did not turn out so favourably. This led me to recur to my former resolution of trying the hemlock bath. It appeared at first this bath kept the disease under, if it did nothing more; and finding that it was attended with no ill consequence, the quantity of the plant used in each bath was gradually increased from twelve to twenty and thirty pounds weight, and upwards. This quantity was always regulated by the season of the year in which the plant was gathered. If it was in its full vigour it was not necessary to use more than twenty or thirty pounds. But it may not be improper to observe that, when I was obliged to employ the
dried

dried plant, a much smaller quantity of this was found equivalent, as it may naturally be supposed, to a much greater quantity of the recent herb.

Some of the first cases of ulcerated cancers, in which I had an opportunity of trying the hemlock bath, were in the Westminster hospital. It will be needless to tire the reader with descriptions of similar cases; but I shall principally refer to two of these patients, because they lived the longest, and thereby enabled me more particularly to note the effects of the method. These two cases were of long standing, the patients advanced in years, and the appearances of such a nature, as not to afford any prospect of success from the use of the knife. In both these instances, the first effects of the hemlock bath used with a large quantity of the plant were the same. A high symptomatic fever ensued, attended with rigors, great increase of pain, and every symptom of an advancing suppuration. I was not alarmed by these symptoms, and endeavoured, not only to quiet the apprehensions of my patients, but also to mitigate their sufferings as much as possible. In a short time the suppuration was far advanced, and affected not only the ulcerations, but extended also to every part that seemed tainted with the disease, which soon came away in large sloughs, accompanied with great abundance of matter. The pain my patients already suffered, and the extreme sensibility of the parts, hindered me from using any dressing but dry lint or soft Goulard cerate to the edges; for, to save the fatigue of long dressing, even the application of my liquid was omitted. To say the truth, I flattered myself, from all the appearances, that nothing more was wanting than a little attention to complete the cure. The first of these patients, Elizabeth Williams, admitted into the hospital on the 23d of September, 1773, soon recovered ease and strength, and in about three months from her admission, the ulcer was apparently reduced to the state of a simple wound, which every one imagined, as well as I, would heal in a short time. She used to rise and walk about the ward in perfect ease, and to all appearance, in perfect health. She was, however, suddenly seized with a putrid fever, which carried her off in a few days, at the end of about four months from her first admission into

the hospital. All I shall observe on this circumstance is, that the illness was sudden, and the issue of it speedy; and that during the little time it lasted, there was no pain complained of in the breast, nor was there any alteration in the favourable appearance of the fore and the parts surrounding it, though the cicatrix was never completely formed.

In the other case, which was that of Mary Randall, a woman about 60 years of age, who was admitted into the hospital on the 15th of December, 1773, the event was different. After the large floughs, caused by the suppuration of the diseased parts, were separated by the use of the hemlock bath, which happened in about three months, every thing went on well, though slowly, for a considerable time. My patient enjoyed ease and health for about six months: but the wound never healed kindly, and some disagreeable appearances began to shew themselves both in the fore and on the edges. I was convinced by other experience, that the efficacy of the powder in the first case, had been owing to the arsenic it contained. and as the other ingredients might possibly increase the pain without adding to the effect of the application, I determined to suppress them. Here I shall take the opportunity of returning my thanks to Dr. Cheston, of Gloucester, for the many useful hints and communications he supplied me with in the course of our correspondence and conversations, respecting the external use of arsenic in this and other complaints where he had tried it with advantage. He advised me to flux arsenic and antimony together, either in equal parts, or with two of antimony to one of arsenic, in the view, by this combination, to moderate the effect of the arsenic by the sulphur contained in the antimony*. This last was the powder used in this case with great caution, and only a little
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* In consequence of these hints, the Author consulted his chemical friends, in hopes of meeting with some preparation of arsenic, which might answer his wishes, to destroy the morbid part without raising that degree of inflammation, which too often brought on fresh indurations; but after repeated trials, he was led to conclude, that none of the various preparations he had made use of, answered his intentions so well as the combination of arsenic and antimony here recommended. After the author's decease, a paper was published by
Dr,

at a time, taking care to use my liquid to all the edges and neighbouring parts, wherever fresh indurations were perceived to arise. An equal, and even a larger proportion of opium was afterwards added to this powder, by which I found its painful effect much diminished. All my endeavours, however, proved fruitless, the patient's pain increased, and she fell a victim to the disease, a year after her admission into the hospital.

Thus I continued treating many cases of ulcerated cancers in many parts of the body, varying these methods according to the different states of the disorders, and what appeared to me to be the constitution of the several patients, and with various success. Some were relieved at first, others I did little or no service to, and others again were nearly cured; the progress of their diseases evidently stopped, their lives were preserved for a considerable time longer than, in all human probability, they would have been, and that, too, with tolerable comfort to themselves, of which there are some instances still living. But I never succeeded in healing any ulcerated cancer besides the first here described, by these methods nor others which shall be hereafter mentioned; except in the instance of one other cancer, which, as it proceeded from another disease, and was treated in a different manner, shall be introduced at the end of this account of the other methods I tried for the cure of ulcerated cancers, which are the only object of this part.

Though my first hopes were now cruelly frustrated in many instances, yet I could not but be convinced from the result of all my cases, that something more had been effected by these methods, than had been done by others, and as arsenic seemed to be the best application externally, I resolved, in the first obstinate case, to try it internally. I was the more induced to this from knowing that it had been administered by others,

Dr. RUSH, in the *American Transactions*, and since inserted in the *Medical Commentaries* by Dr. DUNCAN, Vol. I. Decad. 2d. on the use of arsenic in cancerous affections. Dr. MOSZLEY has likewise given an account of the successful effects of Sublimate in the same complaint, in his treatise on tropical diseases, which the reader will do well to consult. H.

and from an account recently published, in which it was said that this medicine had been given with effect in cancerous complaints. I determined, however, to give it in my own way, and therefore weighed out a grain of arsenic, and mixing it thoroughly in a glass mortar with a scruple of testaceous powder, made it up into a mass of pills, with a small quantity of syrup. This was divided into sixteen pills, made exactly equal, by carefully weighing them separately one against the other. These pills were always prepared by myself.

On the 5th of October, 1774, Ann Bond applied to me with a cancerous ulcer on the right side of the tongue about the size of a crown piece, surrounded with indurations, and very painful. She came into the hospital on the 18th of January, 1775. She was at first put into the hemlock bath, the flores martiales were administered internally, and the ulcer was smeared with a mixture containing one drachm of spirit of salt, five grains of arsenic, and twenty of opium, with a sufficient quantity of testaceous powder to make the whole into a consistence somewhat like that of mel ægyptiacum, a portion of which was also sometimes added to this mixture; and whenever any separation was likely to take place from the action of the arsenic and the spirit of salt, the use of the mixture was suspended, and the mel ægyptiacum used alone. Sometimes the sore was merely washed with my liquid. When the mixture was used, the patient was directed to take particular care not to swallow any of her saliva for several hours after, and to wash the mouth with some of my liquid, lowered with water, before she swallowed her saliva, or took any food. The corrosive sublimate was soon after substituted to the martial flowers, as being judged from Doctor Akenfide's observations, to be a medicine better adapted to this case. With this medicine internally, and the fore-mentioned applications externally, some advantages were gained; but the disorder still proving obstinate, I resolved at length to give the arsenic internally, beginning with the sixteenth part of a grain every day, and gradually and carefully increasing the dose till my patient took a grain in the day. This patient could not bear much more than this quantity, for when she had taken a grain and a half for a few days, she

was seized with tremors of the limbs. But another patient I had at the same time with a cancer in his face, who was a remarkably strong man, took two grains of it daily, without finding the least inconvenience from it. From the time of my using this medicine, the appearances grew so favourable, that I was in great hopes of completing the cure, and many other surgeons who saw the case with me, and had seen it in its worst state, were of that opinion. But the obstinacy of the disease made me judge it necessary to increase the dose of arsenic, if my patient could bear it, and therefore I fused it with four times its weight of sulphur, with the view of tempering the violence of its action. I began with the same quantity mixed with sulphur that my patient had been used to take by itself, that is, a grain of arsenic in the day; and soon found that I could use it much more liberally in this way than before. For she soon took four and five grains of the mineral every day in this combination with sulphur, with less inconvenience than she took one grain and a quarter of the arsenic alone. But if the violence of this medicine was diminished by this combination, it soon became evident that its efficacy was likewise decreased by it; for the disorder seizing the tonsils and other glands about the neck and throat, the patient died in about ten months from her admission into the hospital.

This, and the other case of a cancer in the face, were the only two cases in which a fair trial was given to the internal use of the arsenic. Encouraged by the fair prospects these trials afforded me at first, I had begun to give it to two other patients. But as the hopes I had entertained of its efficacy in the two first instances, were afterwards disappointed, and that, however promising the internal use of the arsenic might appear to me in these complaints, it still seemed impracticable to give it in such doses as to insure success, I thought myself not justified in continuing or repeating the trial. I therefore would not suffer my other patients who had begun, to continue taking it; and from that time never prescribed any arsenic internally, judging that the advantages arising from it were not sufficient to compensate the risk. The ascertaining of this point appears to me to be a very essential, and, indeed, a very necessary circumstance,

cumstance, for if, from the boldness of some publications on the subject, others should be tempted, as I was, to make the experiment, in hopes of contributing to the relief of mankind in these terrible cases, they will probably be deterred from it by this fair exposition of the matter. At the same time I am inclined still to think, from all the observations I have been able to make, that arsenic is really the true antidote against this disease; but as its internal use is attended with great danger; and that every attempt to correct its noxious qualities, seems to lessen its efficacy, it is not probable that it can ever be given so as to produce a complete cure.

The other case of a cancer in the face, alluded to above, in which a fair trial was given to the internal use of arsenic, was that of Mr. Champness, a man of the most vigorous constitution I ever knew. He was 67 years of age when he applied to me, in August, 1773, and his complaint had then been of eight years standing. He had been for two years under the care of an eminent and skilful surgeon of this town, who, as he informed me himself, had very humanely taken a great deal of pains to do him service, though his attempts had not been attended with success; for the patient assured me, that the disease had been constantly increasing since that time, and that its progress had been very rapid for the last fortnight before he addressed himself to me. When I saw him first, all that part of the face between the edge of the os malæ and the ala of the nose on the left side was eaten away. The lower part of the ala of the left nostril was quite corroded, the lip separated from its adhesion to the gum, and almost destroyed on the left side. The small remaining part of the lip on this side was very hard, and the induration extended to the right side and up the right nostril. This patient, as I before observed, being of a remarkably strong habit of body, I had an opportunity of giving the arsenic its full trial with him, both externally and internally, and with such appearance of success, that in the beginning of the year 1775, all the sores had healed except one, and that was in so favourable a state, and my patient so free from pain, that I had scarce a doubt of completing the matter, and, indeed, told the gentleman who had before attended him

him of this expectation. But my hopes were again disappointed. The wound was never completely healed, and though the disorder remained very tolerable, and was kept from spreading for a twelvemonth after this, yet about the end of that time it began to break out again, till at length it reached the glands of his throat. Notwithstanding this, he lived till the latter part of the year 1778, and for the last year of his life, as I have been informed, in a very miserable state, having lost so much of his lip, jaw, and teeth, that it was with the greatest difficulty he could swallow any food. Though this patient persevered in the use of the arsenic for six months, in the dose before mentioned, yet he never experienced the least inconvenience from it. He was in good health, and continued even his daily labour all the time he was taking it, and for a long while after he had left it off.

As I have hitherto only mentioned two methods in which I applied the arsenic externally in cancerous ulcers, to wit, the arsenical and metallic preparation used in the first case, and the arsenic fused with antimony in other cases, I shall now communicate another method of using it, which I first tried on Mr. Champness; I mean, mixed with an equal quantity of sublimate. This hastened the action of the arsenical caustic considerably, and made a much larger eschar, nor did it appear to cause greater pain than was complained of when the arsenic was used alone. It must, however, be observed, that a large share of opium was mixed with every caustic I applied, from which considerable advantages resulted, the pain being generally less in proportion to the quantity of opium employed.

While my thoughts were engaged on this subject, I made frequent researches among the manuscripts of the Museum, in hopes of finding in them something relating to it. I communicated this circumstance to Doctor Morton, who being thoroughly acquainted with the manuscripts, might possibly give me some leading information to assist me in my enquiries. He told me, that in the Harleian library he had seen a recipe called the Earl of Arundel's receipt for curing a cancer, which he imagined to be the same as that used by Mr. Guy. He was so obliging

as to instruct me where to find it, and I shall here give it the reader just as I extracted it from the manuscript at the Museum.

The EARL of ARUNDEL's Receipt to cure a Cancer.

The causticke powder.

Take one ounce of yellow arsenicke, and half an ounce of bole armo-
niack, mix them well together, and make them into fine powder.

The glistering causticke powder.

Take an ounce of yellow arsenicke, of red precipitate, and bole armo-
niacke of each $\text{ʒ}\text{ss}$.

The tarte water.

Take an ounce of white sublimate, halfe an ounce of red precipitate,
beat these together very small, and put it into three pints of white wine
vinegar, and boyle it neere to a quart, and when it is cold keepe in a glafs.

The red water.

Take a lime stone or two about two pounds, boyle two gallons and
a halfe of spring water out of a rock rising against the sunn, put the lime
stones into an earthen pot, and then power the boyling water upon them.
Cover all close and so let it stand a day and a night, then power of the
clearest and throw away the bottome: then take of bolus verus, roch
allum, white copperas, aloes sicotrina, and campher of each two ounces,
beate and searse them fine and mix them well with the said cleare water,
and let these all boyle together for an hower, then put it in a pot close
stopped till it be cold, and then turn it into a glafs botle close stoped and
use the clearest.

The green oyntment.

Take lbiss of fresh hog's grease, $\text{ʒ}\text{iiii}$ of venice turpentine, lbiss of rosin,
half an ounce of verdigrease, beate the rosin and verdigrease together,
put all together into a skillet, and boyle them till it comes to a salve,
and strayne it into a gallypot.

The

The use of the things.

Take some of the causticke powder and mix it with green oyntment, spread it thin upon a cloath the just bigness of the noli me tangere, and apply it thereunto, it must ly on eight or ten days till it falls off, and then apply one other till all the dead flesh be spent.

The white tarte water is to be applyed to the noli me tangere, with a cloath diped in it, if occasion require. Also it is good for a cancer in the nose, ringworme, or for any dead flesh.

The red water is to wash the eyes if bloud shot, or pir, and webb, also to preserve the sight; used either for any fore, to be used warme, and to be cast in with a syringe, if occasion.

The green oyntment is to be applied to the noli me tangere after the causticke hath done his working, to heall and draw. It is used also to draw any fore.

Be it knowne that I, Elisabeth Fellow, wife to Henry Fellow, blacksmith, dwelling neere St. Laurence street, in Oiciter, do protest and vow, before God, that I have trewly and faithfully sett down and discovered in this note delivered by me to the Right Honorable the Earle of Arundell and Surrey, Earle Marshall of England, the whole full and perfect receipt and manner of cure of the noli me tangere, which my father used, and often caused me to make, by which he ordinarily did cure that malady. And I do hereby faithfully promise and sweare not to teach, give, or sell the said receipt at any time hereafter to any person or persons whatsoever, other than my owne children, in witness whereof I have set my marke, this 16th of October, 1638.—

Elisabeth Fellow,
her g mark.—

Witness'd
Fred. Bently,
Adrian Medcalfe,
Philip Howard.

Extracted from Colepeper's *adversaria*. Vol. XV. Q. R. Oxford library, British Museum.

I have thought proper to give the whole of this extract, rude as it is, and though the *red water*, mentioned in it, be foreign to the subject. As soon as I had read this receipt, it appeared to me that it was not Mr. Guy's, because this application would not act through the cuticle, as I knew Mr. Guy's did. It could not therefore be used in schirrous tumours that were not yet ulcerated, and was peculiarly adapted, as the receipt expresses, to the *noli me tangere*, the name given to an ulcerated cancer on any part of the face, a disease of which it is well known that Lord Bolingbroke died after the application of Mr. Guy's caustic. I therefore prepared only the caustic powder, the tart water, and the green ointment, omitting the red water for the reason above mentioned, and the glittering caustic powder, because in the detail of the use of the things, it was not mentioned what purpose that powder was designed for. With respect to the green ointment, I had it prepared merely for the sake of complying with the receipt, not from any opinion of its utility, for I have already declared my aversion for every kind of greasy application in these cases; and the powder may as well be formed into a consistence with the yolk of an egg.

In January, 1775, a wealthy farmer of Suffex, aged 73, applied to me at the desire of Doctor Pepys. He had a *noli me tangere* on the right cheek: it came on about twenty years before with a small pimple, which was frequently shaved off by the razor. It increased gradually to the size of a pea, and grew very troublesome, being attended with a sharp pricking pain. In this situation he applied, about a twelvemonth before he came to me, to an apothecary in the country, who put some butter of antimony upon the part. Far from being helped by this, he grew gradually worse; and when I saw him, there was an ill-conditioned cancerous ulcer on his cheek, about the size of a crown piece, and surrounded with edges, turned in and extremely hard. The induration at the upper
part

part extended over great part of the os malæ, and nearly to the orbit. He felt a good deal of pricking darting pain in it at times.

As I had observed that the preparation of arsenic and antimony used by me in former cases, had been much too slow in its action, I determined in this instance, to give a fair trial to this receipt of the Earl of Arundel's, upon a presumption that it would act more speedily and powerfully than the preparation I had used. Some of the caustic powder was therefore mixed with the green ointment, and applied, according to the directions, upon the whole extent of the *noli me tangere*. This acted strongly, and in about a month after, the whole of the diseased part to which it had been applied, came away. But some of the hardneſſes beyond the ulcer where the skin was not broken, and on which the caustic could not act, still remained. The bottom of the sore looked extremely well for a time, but I afterwards found that the surrounding indurations fed the disorder. I endeavoured to get rid of these by applying my liquid to them, and by touching the diseased granulations, wherever they were observed to rise with the *tart water*, as directed in the receipt. The application of the caustic was likewise renewed several times to the ulcerated edges of the indurations, in hopes of destroying them gradually. By these means carefully and attentively pursued, I succeeded so far in about five months as to subdue most of the disease, and very nearly to consolidate the wound. There remained, however, still something to be done, which I had the greatest reason to hope would have been accomplished, because all the parts before treated had gradually yielded to the method. I used every argument in my power to persuade my patient to stay longer under my care; but the attendance had already been tedious, and he was of an unquiet restless disposition, and withal very uneasy at being so long absent from his family and his affairs, so that it was impossible to prevail upon him. His son, however, who was a surgeon in the country near him, came to town; and I supplied him with all the medicines, giving him as clear directions as I possibly could, for the occasional application of them. Whether these were closely followed I cannot take upon me to say, but am inclined to think they were not, for the old gentleman was

wearied, and I should suppose not disposed to follow the method any longer. Whether this were the case, or whether the disorder would have been equally incurable whatever method had been pursued, I cannot take upon me to contend. So far is certain, that some months after, the patient returned to town, and put himself under the care of a quack, who reduced him so much in a short time, without doing any service to the complaint, that he was very near dying from mere faintness and debility. He then had once more recourse to me, and I scarce knew him again on account of his being so much altered from the hearty strong man I had before seen him. Though the disorder was worse than when he had quitted me, yet it was by no means arrived to any dangerous height, nor was it near so much advanced, nor in so bad a state as when he first put himself under my care. But he was now too much harrassed both in body and mind with what he had gone through, to think of submitting again to painful dressings; so that I now resolved to try the effect of fixed air upon the part, which I was informed had been tried with success in these cases by an ingenious gentleman in the profession. This application was continued for some time, and it appeared to keep the wound clean, and the part tolerably free from pain. But as he was again anxious to return into the country, I furnished him with the apparatus for continuing to apply it himself. I was informed, to the best of my remembrance, that he persevered in it till the time of his death, but without its producing any particular effect on the disease.

Since I have had occasion to mention the application of fixed air in these complaints, and that great expectations have been raised amongst philosophers of the present age from the introduction of this newly-discovered remedy into practice, I shall take this opportunity of communicating what has passed under my observation respecting the use of it in these disorders.

I have tried it in several cases of ulcerated cancers for a considerable time; and pursued the following method in applying it. I first adapted an open bladder to the end of a flexible tube of a convenient length, and
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placing this bladder upon the sound parts round the cancerous complaint, so as carefully to include the whole of the disease, I confined the margin of the bladder by applying to it a piece of sheet lead, which was held close to the surrounding parts by one or more assistants. The end of the tube was then fixed into the mouth of a pretty large bottle, into which small pieces of marble had been put to a fourth part of its height, and the bottle itself about half filled with water. A quantity of oil of vitriol being then poured into the bottle, an effervescence was raised, which driving the vapour rapidly through the tube, inflated the bladder. The fixed air being thus conveyed to the wound was kept there for half an hour, or an hour at a time, as long as the patient could bear the process. If the bladder grew slack, the effervescence was raised afresh by shaking the bottle, or adding more oil of vitriol to the marble*. This application was renewed twice or three times in the day, and if I could have prevailed upon my patients to do it oftener, I would; being of opinion, that if any success were to be expected from it, it must be owing to its being reiterated frequently. I imagined, indeed, that if it had been possible to keep the part constantly immersed in fixed air, without any communication with the external air, this would be the most likely method of insuring success. However this may be, in all the cases wherein I tried it, it did not by any means confirm those expectations that report had raised in me of its utility. It never in any one instance disposed the cancerous wound or any part of it to heal; and all the benefit I experienced from the use of it, was keeping the wound sweet and clean. This indeed is no inconsiderable advantage, where these effects cannot be brought about by other means, less inconvenient than this. Neither can I ascertain whether it contributed in any remarkable degree to abate the pain of the disease, for all the cases I tried it in were very far advanced, and the patients having been used to obtain relief from opium, did not chuse to relinquish a medicine, the good effects of which they had felt.

* Perhaps this detail may be deemed unnecessary, considering how well the method of producing fixed air is known. But I thought it proper to particularize the mode in which I used it, that it might be determined whether my want of success were owing to this.

Let

Let us now consider in what view the application of fixed air has been tried in cancerous affections. Except in some late instances where, from Doctor Hales's hints, it has been ingeniously suggested to be a dissolvent of the human calculus, the only principle upon which it hath been used in the disorders of the animal œconomy, is that of its resisting putrefaction. From Sir John Pringle's curious experiments on putrid animal substances, which, together with those of Doctor Black on the nature of calcareous earths, were the basis of all the experiments since made by Doctor Macbride, Doctor Priestley, and others, and the doctrines established in consequence of them, it appears, indeed, that fixed air, both as an internal medicine, and as a topic, is likely to become very beneficial in all putrid diseases. But what effect are we to expect from it when applied upon this principle to cancerous complaints? A cancer cannot surely be called a putrid disease, for the symptoms and appearances that attend it, are directly contrary to those in which we find the putrid diathesis prevailing in the machine, such as scurvy, putrid fevers, &c. In all putrid diseases the solids of the body are softened and relaxed; in cancers, those parts that are affected with them are bound by the most rigid hardnesses. In putrid diseases the solids become flabby and much increased in bulk, unable to resist the impulse of the fluids; in the true cancer, the parts are all contracted into a narrow compass, puckered up and drawn in, so that if a woman have one breast thoroughly affected with this disease, it will be much less in size and appearance than the other, even before any of its substance shall have been destroyed by the ulceration of the part. It will be urged perhaps that ulcerated cancers are generally accompanied with an extremely offensive smell, which indicates putrescency. Not to insist upon the circumstance that an offensive smell is not always an indication of this quality, I shall only observe, that the stench in these cases appears to be an adventitious symptom of the disease; it is the consequence of its ulcerated state, and is generally proportioned to the size and extent of the ulcer. If the cancer were of itself and *ab origine* a putrid disease, it is most probable that it would be cured as soon as the *foetor* were corrected; as is the case with other putrid distempers, which are cured whenever the tendency to putrefaction
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can be overcome. But it has already been observed, that fixed air in all the trials I have made of it, though it generally corrected the offensive smell, has not cured the complaint, which agrees nearly with what Doctor Percival has said of its effect in these cases. There are, indeed, other means of correcting the smell of cancerous ulcers, and much more simple than the application of an apparatus for the generation of fixed air, and which, from all the observations experience has furnished me with on this point, seem to answer the purpose as effectually. The several topics I have used for this purpose are the flowers of zinc, the calamus aromaticus in powder, either alone or mixed with such a proportion of powdered salt ammoniac as my patients could bear; sulphur, either alone or combined with a small portion of arsenic, which last preparation shall be spoken of more fully in the sequel of this work. These are the dressings I have chiefly used in the intervals of such as were more active, and by means of which, I have generally preserved my cancers from any very offensive smell; and even in the last stage of the distemper, have succeeded in diminishing greatly this nauseous symptom. Doctor Wathen saw a remarkable instance of this in an extremely offensive cancer, which he saw with me in the most deplorable state of the disease. He expressed his surprize on finding this stench much corrected in a few days by means of some of the fore-mentioned alkaline and absorbent powders, assisted with an outward covering of rags dipt in spirituous applications. The spirituous covering I generally used in these cases, was the martial and ammoniac tincture above mentioned, either alone or diluted with water, without the addition of the oil of vitriol, which answers nearly to the common tincture of steel with salt ammoniac, to be found in some dispensatories. I shall here observe, that in all offensive cancers we ought religiously to abstain from every kind of greasy application, however mild and innocent it may be, and even were it only used with a view to keep on the dressings. No ointment must come near the sore, or even touch the neighbouring sound parts. When the cancerous wound is small and free from any offensive smell, it is better still not to use any grease if it can be avoided; and if we be forced to it, from the dry lint sticking to the edges, it will be best to powder the sore first with flowers of zinc, and

and lay nothing over but the Goulard cerate, or some such mild ointment. Basilicon or the green digestive always add to the offensive smell. Let me be permitted to observe by the way, that it might possibly be better if these digestive ointments were banished from the practice of surgery, and more particularly from the treatment of simple wounds. The smell of them is of itself very disagreeable to the patient as well as the surgeon, and I am fully persuaded they are of no use. The purpose of keeping a simple wound moist and protected from the air, is as well effected by a little white wax and oil melted together, which to render it pleasing to the eye, may be coloured with alkanet root. This kind of ointment, the Goulard cerate, and the epulotic cerate, are the only topics I have used to simple wounds for these last fourteen years, either in public or private practice. The advantages arising from this, are, that the wounds thus dressed do not yield so great a share of matter, that the granulations are not therefore so likely to rise above the edges of the sore, that these edges themselves are more easily kept clean, and that the dressings are not in the least offensive to the patient.

But to return to the subject of fixed air. If I did not apply it to cancers merely with a design of correcting their foetid smell, as others have done, it may be asked what was my view in trying it. I acknowledge that my expectations of success from it in cancerous affections, were founded on its mephitic quality, rather than on its salutary properties. I have long suspected that the cancer was produced from insects or the germina of them taken up from the air by the lymphatic vessels; and that in the instances of schirrous tumours, which sometimes continue for a long time in a state of ease and tranquillity, these germina thus absorbed, remain in an inanimate state till some accidental circumstance brings them to life. This has appeared to me to constitute the ulcerated state of the disease. I am not singular in this idea; for in one of the volumes of tracts upon cancers, collected by the late Mr. Bell, which was lent me by Dr. William Fordyce, I found it introduced as a received opi-

opinion *. And in another tract in the same volume, written in the Italian language, the author speaks of having seen the insect †. But whatever may have been the ideas of others upon this matter, for my own part, I have been led into this conjecture, from the nature and situation of the parts in which the disease is usually seated; from the kind of pain peculiar to it, and the progress of the ulceration; from analogy, and the effects of poisonous medicines upon it.

* The parts chiefly affected with the cancer are the breasts of women, the womb, the tongue, the lips, the nose, and the face. All these parts are abundantly supplied with absorbent vessels, and are most of them exposed to the external air, so that if there be any germina of insects floating in this fluid, they will be ready to absorb it. The breasts of women in particular, which are by far the most ordinary seat of the complaint, are remarkably full of pores, and from the various state of distention they undergo, these pores must certainly become at different times very large, and consequently more fitted to receive and transmit any thing from without. The mammary glands also, to which the lymphatic or absorbent vessels immediately tend, are usually the parts first affected †.

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* Tota intentio arsenicum adhibendi videtur superstructa esse opinioni illi, quod cancer vivat. Aut juxta forte pathologiam animatam, quod ex innumeris vermibus vivis confietur. Dissertatio de cancro a Martino Schumacher.

† Ma non andò guari, che crudelmente risorsero (gli spasimi vuol dire) e nuovamente del pari si scemarono, allora quando per gli stessi canali d'onde era piovuto il marciume, un picciolo vermicello si aperse il passo, grosso come un filo ordinario da cucire, lungo alla misura del primo nodo del dito mignolo, di colore rossiccio, siccome sarebbe una fibra di carne salata.

Nuovo metodo per curare sicuramente ogni canchero coperto, e specialmente le ghiande scirrofe delle mammelle, e di altre parti del corpo: opera di Giuseppe Maria Quadria.

† I am aware that there are frequently indurations or schirrous tumours of the internal glands, such as the liver, mesenteric glands, kidneys, &c.—But it may be considered, that if these germina be absorbed from without, they may either be stopped in the first gland through

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which

The second circumstance which suggested the idea to me of the cancer being generated by insects, is, the kind of pain peculiar to the disease, and

which the vessels that absorb them pass, or may be accidentally hurried on with the circulation, and deposited in the course of it upon some of the internal glands. Exclusive of this circumstance, it is pretty apparent, that these indurations are different from the true cancer; so that whether we suppose them produced from the same cause or not, we find at least that the effect is different. Indurations of the mesenteric glands are marks of the scrophula; and the symptoms and appearances attending scrophulous hardneſſes are extremely distinct from those which accompany the cancerous induration; and might be accounted for upon a very opposite principle, were it not foreign to my present purpose. With respect to scirrhus tumours of the liver, though they also appear to be indurations of a different kind from the cancer, yet as I suspect this disorder to be more frequent than it is generally imagined, it will not, I hope, be thought intrusive, if I take the opportunity of this note to communicate what has occurred to me in the treatment of these cases.

A negro servant belonging to Doctor Mac Namara was admitted into the Westminster hospital under my care. He had a large prominent tumour on the right side of the linea alba, and immediately under the margin of the chest. From the seat of the complaint, the symptoms attending, and from an obscure fluctuation discerned in the tumor, I suspected this to be an encysted abscess of the liver, a disease often met with among negroes, and therefore resolved upon opening it. I made an incision through the whole extent of the tumour, and after having divided the muscles of the belly and the peritonæum, gave vent to a quantity of matter, which evidently appeared to be contained in a large cyst, totally distinct from the cavity of the belly as usual in these cases. The sac ran so far back towards the spine, that it was not possible to empty it at once, and, indeed, the contents were so viscid and tenacious, that it was only by repeated injections with barley water, continued for about three weeks, that the cyst could be entirely evacuated. When this was done, and that the sides of it were consequently brought nearer together, one might plainly feel an enlargement and induration of the liver, extending through the whole of its region. In little more than two months the wound was healed, except that there remained a fistulous opening which it was impossible for me to close. Considering that this orifice might be kept open by the disease of the organ, I directed my patient to rub half a drachm of strong mercurial ointment every day on the region of the liver, suspending the use of it occasionally, that the mouth might not be affected. By persevering in this course about six weeks, the whole of this immense induration subsided, and the fistulous opening, closed of itself. The success of this case induced me to try the effect of mercurial frictions in two other instances, of an enlargement and induration of the liver, evident to the sight and touch. Both these cases were cured by this method; even the induration, which was farthest advanced, and in which a prominence

and the progress of the ulceration. Nothing seems more properly to favour the notion of insects corroding the parts, than that shooting darting pain complained of in this disease, which the patients describe as the pricking of so many needles. The same may be observed of that gradual, creeping, and almost imperceptible corrosion of the parts, by which not only the whole substance of the breast is frequently destroyed, but the ulceration is also extended to the neighbouring skin, and a wound is produced of a most horrid appearance, full of cavities and inequalities, not unlike a piece of mouldering ruins. To which we may add, that the disease extends itself in the direction of those lymphatic vessels which first conveyed it to the mammary glands, forming hard chords which terminate and are lost in the indurated glands of the arm-pit.

The third circumstance which has given rise to my conjecture, is analogy, and the effects of certain poisonous medicines upon the cancerous affection.

a prominence on the same spot where the negro's large swelling had appeared, seemed to indicate a tendency to suppuration, was dissolved without the formation of matter.

Those who are conversant in dissections, have frequent opportunities of seeing, that large and indurated livers are commonly found in the abdomen of persons who die of a dropy in that cavity. These indurations have, indeed, been reckoned by some as the chief and perhaps the only cause of these collections of water; which, if it be the case, must be owing to the pressure of a hard mass upon so large a vein as the vena cava; thus obstructing the course of the blood returning to the heart; in the same manner as the pressure of the gravid uterus occasions an anasarca in the legs of pregnant women. Is it not probable, then, that this terrible disease might be cured if this apparent cause were removed? Accordingly, I remember to have found (though I cannot recollect where, having unfortunately lost many of my papers) that it was a practice used with success in India, to rub the belly with mercurial ointment in the dropy of that cavity.

Some years ago I translated a manuscript paper for Dr. Fothergill, which had been sent to him in the German language from a gentleman at Moscow. The author mentioned that he had observed many internal complaints to proceed from indurations of the liver, which could not otherwise be accounted for. He accordingly recommended a more frequent examination of the state of that organ than is generally attended to.

Every insect seems to have its particular bane. Thus in that cutaneous disorder the itch, which from Lewenhoeck's microscopical observations has been shewn to consist in numerous insects swarming on the surface of the skin, sulphur has been found to be the most effectual poison. There are, indeed, other poisons that will destroy these insects, such as hellebore and mercury, but none of these are near so powerful against them as brimstone*. Thus there seems also to be a particular poison against the cancer, which is arsenic; which, in many instances of Mr. Guy's practice, and others upon record, has destroyed several cancerous affections, and which, from the experience I have had of it, though so often unsuccessfully used, appears still to be the proper antidote to this distemper. The fact seems to be, that it is a poison of so dangerous a nature, that it can seldom be used in sufficient quantity to bring about the desired effect, without exposing the patient to too great risque. But if the arsenic be not used in sufficient quantity to eradicate the disease, it does hurt rather than good, because after having lost its quality of an antidote, the ill effects of its having acted as a caustic still subsist, and the irritation it has occasioned exasperates the disease. For we well know that cancers, when irritated by caustic applications of any kind, are considerably hastened in their progress, which seems to form another presumptive argument in favour of the conjecture I have ventured to mention: for when the insects find themselves disturbed by an external application, they will make what haste they can to get out of the reach of it. Besides, no other caustic ever acts upon the cancerous affection in the manner that arsenic does; for, were we to attempt to extract schirrous glands by any other caustic, we should constantly fail in our attempts;

* Perhaps it may hereafter be found, that most cutaneous disorders arise from the same cause. At least they seem for the most part to have a particular poison appropriated to them. Thus we find, besides the instance of the itch, that in venereal blotches on the skin, sublimate is acknowledged to be the most powerful preparation of mercury. Hellebore has been recommended by the ancients, and is still prescribed in many cutaneous eruptions, which we know not how to cure otherwise; and in the tinea or scald head, I have found no poison so effectual as a strong decoction of tobacco, by which I have cured some obstinate cases of this kind in a very short time, after all the usual methods, not omitting even the pitch plaster, had been tried for a long continuance without effect.

which

which I am convinced of, as well from the testimony of others, as from my own experience. On the contrary, though Mr. Guy's caustic hath not succeeded in every case, yet it is no less certain, that many have been cured by it, and that he has frequently extracted schirrous glands entire with it. A most singular effect, which I have also accomplished in one instance, which shall be related hereafter.

These are the several reasons that have encouraged me in the conjecture of the cancerous affection being produced by insects; and which induced me to try the application of fixed air to these complaints, in hopes that its noxious quality would destroy these insects and cure the disease. But it is an extremely difficult thing to apply mephitic air to cancerous ulcers, in such a manner as to exclude all communication with the external air, upon which circumstance alone, according to my ideas, its efficacy must depend.

The inequality of the parts on which the apparatus is to be fixed, and sometimes the extent of the disease, are obstacles to the close adapting of it, which in some cases are insurmountable. Add to this, that a bladder is the only thing that can be made use of to contain this mephitic air; for if a hollow glass were applied, it is evident that it would act like a cupping glass, and become insupportable upon parts already extremely sensible. Doctor Priestley observes too, that *a bladder, he has found by experience, will not long make a sufficient separation between several kinds of air and common air* *. These may, perhaps, be the reasons why the application of fixed air has not succeeded with me. Whether the nitrous air discovered by Dr. Priestley, and which he observes to be more noxious than the former, will succeed better, must be determined by future experiments.

Such were in general the methods I used, in the treatment of ulcerated cancers; besides which, upon superficial cancerous wounds, where it was

* Experiments on air, vol. I. p. 37.

my design to make a flight eschar with little pain, or where I was endeavouring to heal the obstinate remains of a cancer previously brought into a small compass, I used to mix some of the *magnes arsenicalis*, or even some crude arsenic, with a proportion of opium, and make it into an ointment by the addition of some Goulard cerate, or any other mild unguent of the same kind. This was made stronger or weaker according to the effect it was meant to produce. The general rule was to take ten grains of the *magnes* with the same quantity of opium, and mix them with one drachm of soft ointment. This mild application gives little or no pain, and produces evidently good effects. It might, perhaps, prove useful in removing any fresh appearances of the disease, that are apt to arise after extirpation, however carefully or well performed. Indeed, unless the arsenical caustic can be applied so as to eradicate the whole disease in a short time, I should always prefer this mode of using it, not only on account of its being rendered mild by the addition of an unctuous substance, but also because, in this mode of applying it, we can always ascertain the quantity of arsenic used upon any patient in a given time. This is a material circumstance to attend to; for if we are too free even in the external application of arsenic for any continuance, it will be apt to bring on pains in the extremities and other disagreeable symptoms. But in this mode it may be continued for any length of time without danger, for as I always spread the ointment as thin as possible upon the lint, a drachm weight of it will last for several dressings, and that drachm contains no more than ten grains of the *magnes*, in which there are but five of arsenic. It appears to me, that the disease may always be palliated and the progress of it checked by this kind of mixture; and, perhaps, if it were continued for many months uninterruptedly, to small cancerous sores about the face, it might often effect a cure: but the great length of time sometimes required to pursue the same method with advantage, frequently discourages the patient and the surgeon too, from persevering as they ought. I have had two instances of this, one of a cancer on the nose, the other the *noli me tangere* above mentioned; both which cases I verily believe, would have been completely cured by a steady perseverance in the use of this mild ointment, had it not been for the restlessness of the patients.

patients and their anxiety to return into the country. Nor do I think it necessary to add the opium to the mixture, unless the crude arsenic be used, and that in a larger quantity, for the application is sufficiently mild without it. I shall take this opportunity to mention, that this arsenical ointment is also very useful in some inveterate ulcers, and likewise in scrophulous sores. I was first induced to try it in scrophulous ulcers, from having found among some of Sir Hans Sloane's manuscripts, that the *magnes arsenicalis* was mentioned as a specific against the scrophula. Though I cannot boast of having found it entirely so, yet I have frequently used the *magnes* alone, or mixed with opium, to these sores, and particularly to the carious parts of bones in them, with very good effect.

I am aware that some persons will censure me on this occasion, for endeavouring to introduce into practice, the old complicated and frequently severe method of dressing sores, instead of those simple and mild dressings so strongly and so justly recommended by all modern writers of estimation. To this charge I answer, that no man can be a greater friend to plain dressings in all simple wounds than I am; which may be collected from what has been already observed in this work, of my having entirely banished from my practice even the common turpentine dressings of basilicon, or the green ointment, which are still almost in universal use. Neither do I ever employ the lunar caustic, the blue vitriol, or any other escharotic remedy, to keep under those luxuriant granulations which in all simple wounds, particularly in young and sound habits, are so apt to rise above the edge of the skin, and prevent cicatrization; though such applications are still in common use for this purpose. To these I have substituted the constant and moderate pressure of a linen roller, wherever the wounds were in a situation to admit of its being applied. This I find more effectual than the former practice, and it is certainly much more mild; for I know, from my own experience, that even the slightest touch of the blue vitriol upon these tender granulations, occasions no inconsiderable smart, which sometimes continues for some hours after the dressing. But there is a discrimination to be made; for however I may be an advocate for plain dressings in all simple wounds, yet

yet there are ulcers, tumours, and complicated sores, the treatment of which may require the exertion of every effort, that a competent knowledge of the *materia medica* can suggest to us. We are, indeed, often obliged to feel our way in the dark in some of these cases, and to vary our applications till experience directs us to one that can even procure tolerable ease to our patient. Nor are we to suppose, that the immense store-house of nature and the processes of the chemical art, have in vain supplied us with so great a variety of substances, the properties of which are so distinct. The study of topical applications and their effects is perhaps too much neglected in this age. It is a study not to be pursued without much labour; and when the knowledge is attained, only partially (for it never can be completely) is not calculated to give the surgeon that degree of eminence which he will acquire from dexterity in operation. I would therefore earnestly recommend to the young surgeon the study of natural history, not merely as a science of nomenclature, but with a view, as Boerhaave advises in his *Methodus Studendi Medicinam*, to acquire an early insight into the properties of bodies; that by combining this knowledge with the nature of the complaint he is to treat, and with experience, he may be led to a rational application of it. This will effectually secure him from having recourse to those unmeaning combinations with which dispensatories abound; and the absurdity of which has been the cause of the disgrace and neglect of topical applications, though much benefit might accrue from a prudent and scientific management of them.

In page 343 of this work, it has been observed, that I had found a preparation of arsenic and sulphur useful in removing the offensive smell of cancers. The method of making this preparation and the proportions are as follow: take of sulphur in impalpable powder, four pounds; of white arsenic in impalpable powder, one pound; mix them, and put them into a small glass retort, place them in a sand heat, and lute on a long neck and a receiver. Raise the fire gradually until the mixture be fused. The fixed mass is the part to be levigated for use, the sublimed part is to be rejected.

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This was the preparation which I had given internally in the proportion of five grains of arsenic in the day, without producing any pernicious effects. From this circumstance, and consequently from the little risque there appeared to be in using it externally, I was inclined to entertain hopes that it might not only correct the offensive smell, but also be attended with more complete success in these cases. I had very good reason indeed to be satisfied with its effects in the few cases I have hitherto had an opportunity of trying it, and which were of the worst kind. It gave scarce any pain, it corrected the smell and the discharge, it alleviated the painful state of the disease, and checked its rapid progress, if it did nothing more. But even this mild application I found could not be used in all cancers, without danger, of which I shall candidly relate the instance.

A lady who had been attacked with a severe paralytic complaint, of which she still had the remains in the difficulty of her speech, put herself under my care, with an exceeding bad ulcerated cancer from which she suffered much pain. Apprehending the consequences of even the smallest quantity of arsenic used in a habit addicted to palsy, I thought it necessary to apprise the family, that my applications being of an arsenical nature, I could not answer for the effect they might produce in such a habit. But so eager was the patient to try for relief, and so desperate was her present situation, that it was agreed we should run the risque of the application, and if it should cause any alarming symptom it might then be left off. I proceeded with all possible caution, and as the sore was very large and deep, and would consequently require some quantity of the powder to cover its whole surface, I made it weaker than usual, by mixing it with equal parts of the flowers of zinc. The sore was so much mended by this in a short time, and the patient so evidently relieved, that the satisfaction experienced from this change, made us overlook, or not pay sufficient attention to, some apparent trifling weakness in the leg, attended with slight spasms. But these symptoms continuing and increasing, I could no longer doubt that they were owing to the absorption of the arsenic from so large a surface as the sore exhibited. I there-

fore desisted from the use of this application, and dressed with nothing more than flowers of zinc and sulphur combined. But notwithstanding this precaution, my patient did not long survive this fresh attack.

From this fact we must conclude, that it is necessary to abstain entirely from any arsenical application in paralytic habits; and that, where the surface of the fore is very large, as it was in this case, and consequently the absorbent power considerable, we should use it with extreme caution.

I am now to give the account which I promised before of the successful treatment of a cancer of another kind, by a method somewhat different from any of the preceding. This disorder was produced from a venereal infection. The patient who applied to me in this case, had had, four months before, some chancres on the prepuce. He had rubbed in a quantity of mercurial ointment, and taken mercury freely internally. He had also taken the decoctions usually prescribed in these cases, but all to no purpose. When he applied to me, in the month of May, 1776, the chancres were converted into an eroding cancerous ulcer, which had then eaten away most of the glans penis, had seized upon the corpora cavernosa, and had destroyed the greatest part of the prepuce*. The

* I am aware here of the distinction so properly established by an ingenious French writer, Mr. Perilhe, in his essay on cancers, between what is called the true cancer and the cancerous ulcer, the latter of which he says sometimes admits of a cure. The case here described may perhaps be thought more properly to come under the last appellation: yet as this distinction seems not to have been so precisely drawn, but that in many cases it may be difficult to ascertain to which class the distemper belongs; it has been thought proper to insert this case here, more especially as, notwithstanding the acknowledgement that cancerous ulcers sometimes admit of cure, there have been no certain rules laid down for the general management of them. There is the greater reason for this, as the usual treatment of this terrible and rapid cancerous ulcer succeeding the venereal taint, is, to the best of my knowledge, mostly unsuccessful. In one of the instances that fell under my notice the testicles were laid quite bare, and hung loose as if the integuments had been dissected from them; in another, the ulcer had eaten away the integuments and muscles of the abdomen, and the intestines came out at the aperture. It will not be improper to add, that in these instances the mercury had been continued to the last; a circumstance which determined me to lay aside the use of it in the present case.

wound

wound was full of ill-conditioned floughs, was extremely offensive and very painful. The skin at a considerable distance from the edge of the ulcer, was quite black and seemed in a state of mortification. This livid appearance of the skin extended itself even to the root of the upper part of the penis, and was creeping on by a red dusky line to the integuments of the belly. I did not judge that there was any success to be expected from the amputation of the part while the mortification seemed to be in its full career. Neither was I inclined to use the arsenical caustic here, lest the eschar produced by it should destroy too much of the penis, the remains of which I was anxious to preserve. On the other hand there appeared to be an absolute necessity of taking some effectual method to stop the progress of the disorder, which must otherwise soon prove fatal to the patient. It then occurred to me that I had met with an account of a medicine consisting of equal parts of crude salt ammoniac, arum root, and crab's claws in fine powder, having been used with good success in cancers*. From the pungency of the arum root, the quickening power of the salt ammoniac, and the utility of absorbent powders in all cancerous, foetid, and malignant ulcers, I judged this combination to be peculiarly adapted to the present case, and therefore determined to try it in lieu of the arsenical caustic, for the reasons above-mentioned; with a full resolution to alter my plan if some remarkable change were not soon produced by this joined to other efforts. Accordingly, I dipped pieces of lint into my liquid, and placed them upon all the black and livid parts of the skin, even to the edges of the sore, directing my patient to wet these pledgits twice or thrice in the day with the liquid. I strewed the whole surface of the ulcer with the powder above mentioned, which, notwithstanding the apparently dead floughs upon it, was still so active as to be sensibly, though not severely, felt. The pills with martial flowers were at the same time taken freely, and that nothing might be omitted from which the least advantage was to be expected, I advised my patient

* At the time of my reading this, which, to the best of my recollection, was in a book of voyages, I had taken a memorandum of the matter with an account of the book I had extracted it from, and the place where the remedy was said to have been tried. But the loss of my papers prevents me from gratifying the curiosity of my readers in these particulars.

to go into the hemlock bath every other day, and to stay in it from half an hour to an hour. All my directions were punctually followed; and there was so favourable an alteration in a short time, that I was encouraged to persevere in the same methods. In less than a month the skin near the root of the penis had entirely recovered its life, and most of the livid appearances were vanished. The sloughs were in a great measure separated, and the wound itself had a quick and lively aspect. But it was impossible to prevent some of the blackest part of the skin, at the edges of the fore on the upper part of the penis, from coming away in sloughs, and thus enlarging the fore. The powder now occasioned a very considerable smart, from the wound being in a more sensible state. This smart was very sharp on the first application, but the violence of it soon abated, though it sometimes continued troublesome for an hour or two after the dressing. I observed also with chagrin, that as some parts of the fore healed others grew worse; the ulcers still continuing to corrode the under part of the glans and the corpora cavernosa, so that my patient was obliged to compound with the loss of a greater part of the penis than I at first hoped. However, by persevering steadily in this course, the progress of the disorder was gradually stopped, and the wounds were all healed in about two months from his first application to me. No sooner was this effected, than my patient, to my great surprize, was seized with swellings and pains in the extremities, and venereal ulcers on the tonsils, which plainly indicated the communication of the original virus over the whole habit. He had, indeed, complained of a soreness in his throat for about a fortnight before the cancerous ulcers were closed, but as there appeared nothing more upon inspection at that time, than an enlargement of the tonsils without any ulceration, I concluded that this appearance was owing to his having caught cold. But now the disease was manifest, and though the former copious administration of mercury had failed in this case, yet I now judged it necessary again to have recourse to mercurial frictions, aided by the internal use of the sublimé. As I imagined also that the failure of this remedy in the first instance, had been owing to its not being brought sufficiently into action, (a circumstance which I am apt to think occurs more frequently than is commonly

monly supposed) I ordered my patient to live very freely during his course of mercury, and gave him at the same time warm volatile medicines, to stimulate the vascular and muscular system of the body, and thus increase the power of the mercury. I also took particular care by the use of the hot bath*, and diuretic decoctions, and by suspending occasionally the use of the mercury for a day or two, to divert it from what seems its favourite channel, the salival glands. By these methods he was entirely cured of all his complaints in about two months more, and is at this time in the most perfect health.

This case seems to point out the following singular circumstance; that the cancerous ulcer succeeding to a venereal infection, is both independent of the original disease, and connected with it. Independent with respect to the mode of treatment, and yet connected with it so far as to imply that the original virus is not yet destroyed but still exists in the habit. It appears to me, indeed, that this venereal cancer differs very little from a complete sphacelus of the part: and this idea may furnish us with the reason why a continued use of mercury, by breaking down the texture of the blood, and relaxing all the solids, seems rather to aggravate than relieve this symptom of the venereal disease, if it may be so called. It is evident, indeed, that wherever there is a tendency to sphacelation, it must unavoidably be encouraged by any medicine that produces such effects as these in the animal œconomy.

I now proceed to speak of cancers of the womb, which I shall consider in the class of ulcerated cancers, as I believe they generally are such when they come under our notice.

I have been consulted only in four cases of cancer of the uterus, but all of them were in the most advanced state. In two of these I did no

* Not the tepid bath, which is usually prescribed in these cases, in what is called the Montpellier method, with intentions very different from mine. But my sentiments on this head will be fully explained in some observations on the venereal disease, which I propose to offer to the public when they are collected and thrown into some kind of order.

good, or very little ; in the other two I gave much relief, and in one of them prolonged life with tolerable comfort, for a considerable time. This was the first case of the kind I was consulted in, and as I have got Doctor Hunter's description of the case by me, written by himself after his examination of the patient at my request, before she put herself under my care, I cannot do better than to give it in his own words.

Nov. 14, 1773.

“ This day, upon examining Mrs. —, I find little or no discharge,
 “ or offensive smell ; so far she is better than when I examined her last,
 “ about three or four months ago, during which time she has done nothing
 “ but drink the decoct. *sarsaparillæ*. Her principal complaint at present
 “ is an almost perpetual call to make water, with an uneasy urging pres-
 “ sure downwards. She has passed some small gravel ; and her urine depo-
 “ sits large quantities of very tough slime. No hardness or tumour is to be
 “ felt outwardly in the hypogastric region ; but on introducing the finger
 “ into the vagina, I still find what I should suppose to be an incurable in-
 “ duration of all the parts at the upper end of the vagina, and which I
 “ should suppose to be in a schirrous state that is introductory to ulceration
 “ and cancer. The hardness with inequality of surface begins about
 “ half an inch within the extremity of the urethra, and about half an
 “ inch more inwards still, the vagina is contracted into a hard round
 “ ring, little larger than just to allow the last joint of my finger (which
 “ is small) to pass. The point of the finger meets there with a softer
 “ round piece of flesh, probably a fungus ; and the ring, with all the
 “ parts surrounding it, are so firmly fixed, that a pretty firm pressure
 “ gives them no motion, nor does it give her pain. This hard ring
 “ would naturally pass for the os uteri, but I think it is too near the ex-
 “ ternal parts to be any thing but vagina.”

Such was the state of the case as given me by Doctor Hunter, to which I shall only add, that this perpetual call to make water was the misery of her life ; so that she scarce ever dared to go abroad, could not suffer the jolting of a coach, and was frequently scarce able to remain for one

quarter of an hour in the same posture. When she addressed herself to me to know whether I thought my medicines would be of any service to her, I freely declared that it was a question I could give no satisfactory answer to, not having experienced them in any case of the kind. Besides, they were cases that, not admitting of any surgical operation, nor indeed of any immediate topical application, except from injections, did not so commonly fall under the cognizance of the surgeon, and I could not, therefore, take upon me to promise her any relief: nevertheless, if the knowledge she had of what I had done in other cancerous complaints made her wish to try the effect of my remedies, I could take upon me to assure her that they would at least do her no hurt, if they did her no good. She resolved then to put herself under my care, and the method I pursued was to prescribe my pills made with flores martiales, to order the hemlock bath, and to have an injection thrown up, composed of a strong decoction of hemlock and my liquid in equal parts; adding to or diminishing the quantity of the liquid as I found she could bear it. She soon took twelve, fourteen, and sometimes twenty pills in the course of the day, each containing ten grains. She went into the hemlock bath, and staid in it from half an hour to an hour, and she used the injection three or four times in the day. She soon grew better in health and freer from anxiety and uneasiness, and when she had persevered in this method for three months she found herself so much recovered, that she could sit quietly in company and play at cards as other people, undisturbed by those frequent calls to make water, which had before been so troublesome to her. She could also bear to go out in her coach, and in a word, was so materially relieved, that she considered herself as almost cured. Though I was far from entertaining such sanguine hopes, yet it is certain that the progress of the disease was so far checked, and the uneasiness of her situation so thoroughly removed, that she lived upwards of a year and a half after her first applying to me, several months of which period she passed in great comfort and ease. She continued the bathing and pills during all the summer of the year 1773, and remained tolerably well till the beginning of the year 1775. Her complaints began then to return, and continued in a greater or less degree till the time of her death; but they never rose

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to such a pitch as they were arrived at when she first applied to me; for in the few weeks before her death she suffered more from a continual hectic fever than from her local complaints, though it must be owned these were likewise much exasperated, particularly the pain she used to complain of in her back.

It is necessary also to mention, that upon the first return of her complaints, I desired that Dr. Hunter might examine her again, to ascertain the state of the parts. This he was so kind as to do, and to give me again the account in writing. But this last paper is among the many I have lost, so that I cannot even ascertain the time when this examination was made. To the best of my remembrance, it was in the spring of the year 1776; and it is but just and candid to declare that the tenor of this last paper, as I have it from my memory, signified that the Doctor found little or no alteration either for the better or the worse in the state of the parts since his last examination: so that, however the symptoms might have been relieved, the disease seems to have existed invariably the same.

Another case of a cancer in the womb, to which I was called, was that of a mantuamaker in Piccadilly. She appeared to me so near death when I first saw her, which was in the month of February, 1774, that I attempted to dissuade her from doing any thing. But she had been so strongly persuaded of the relief I had afforded in the case above mentioned, and withal so totally overcome with pain, that she conjured me to try what could be done. Her pain was constant, so that she scarce got any rest, even with large doses of opium; the discharge from the uterus was prodigious, constantly wetting through numbers of thick cloaths that were laid under, and frequently changed, to receive it, and was so intolerably offensive that one could scarce bear the room. Add to this, that the patient's strength was totally exhausted, and her complexion changed into a yellow cadaverous hue. I directed her to go into the hemlock bath every other day, and to take the pills with flores martiales constantly and freely. Deplorable as this case seemed to be, I was astonished at the sudden change produced in it. In three weeks time, the patient's pains were

were so far lessened, that she slept comfortably with much less opium than she had used before in vain; and her strength was so far recovered, that she could sit up best part of the day. The discharge was so amazingly reduced in quantity, that it was not in the least troublesome to her, and the smell of it was inoffensive. Notwithstanding these favourable appearances, she died, after remaining for about four months in a languishing but quiet and calm state, free from the violence of those symptoms that had excruciated her for so long a time before she had applied to me, and which nothing she had hitherto tried could give the least relief to. Although this case was so desperate, that it could not certainly have been considered as any impeachment of the method if no effect had been produced by it, yet I cannot but be persuaded, that besides the speedy and unexpected alleviation of all the symptoms, it contributed to allay the miseries of this patient during the last months of her existence.

The third patient who put herself under my care with this dreadful complaint, was a lady of quality. The lady flattered herself that she felt some degree of relief at first; but for my own part, I freely acknowledge that I do not think she received the least benefit. It is necessary, however, to observe, that her stomach being very weak, she never took the martial flowers so freely as the other two patients.

The wife of a surgeon in the country, was the subject of the fourth case of cancer of the uterus that fell under my notice. Though the patient was a young woman, yet her case was as far advanced as that in the second instance, but in a different way. Being less corpulent, the discharge was less, and less offensive; but the frequent and considerable losses of blood she sustained, had reduced her to extreme emaciation and weakness. The relief procured in this instance was more marked than in the last, but not in the least to be compared to what I had seen in the two first instances. My patient returned into the country, and died a little more than two months after she had applied to me.

It has often been observed, that our frequent failures in the cure of a cancer in the breast, arise principally from the long concealment of this complaint, proceeding from the ill-judged and fatal modesty of some women. The disease in some, thus becomes unfit for the operation, or too much fixed in the habit to be relieved by it. This bashfulness must operate much more strongly with women who are afflicted with a cancer of the womb; and how much more effectually must it prevent the success of any means that may be attempted to cure this too common and too fatal disorder of the fair sex. Neither indeed could women prevail upon themselves to disclose these complaints in their earliest stages, which I am inclined to think they often do under the appearance of other disorders, is there any determined criterion to assure the physician or surgeon of the nature of the disease. The most terrible cancers of the breast sometimes proceed from almost imperceptible beginnings, or from small scirrhus tumours, which shall have existed for many years in the body, without pain or trouble to the patient. And it is reasonable to presume, that these uterine complaints may arise from the same imperceptible beginnings, and may also continue in the part for a long time before they exert their violence. I have heard many women complain of a pain in the back, which though not violent at first, and coming on only at intervals, has been considered by themselves, and by the medical people they consulted, as rheumatism or gravel, and has been treated accordingly, or neglected as a thing not very violent, and that would of itself wear off. This is sometimes attended with a fluor albus, or what is commonly called the whites, in which case the pain in the back is often attributed to debility arising from the discharge. I shrewdly suspect these symptoms, even when separate, to indicate frequently the beginning of the cancer in utero, and when combined, more particularly so. It is necessary therefore when a female patient complains of pain in the back, to examine carefully the nature and seat of the pain. If it be rheumatic, it will generally be seated about the fascia of the loins, it will be exasperated by lying in bed, and more severely felt upon first rising from a recumbent posture, and it will be alleviated by the necessary motion and exercise of the day. If the pain proceed from urinary complaints, it will probably
be

be seated higher up in the loins, and will most properly be distinguished by the other concomitant symptoms of these affections, and by their yielding to the usual remedies prescribed in such cases. But if the pain be of that pricking darting kind so peculiar to the cancerous affection, if it be much aggravated by motion, and if it be seated lower down than the fore mentioned complaints, upon the os sacrum, and particularly if it be attended with a discharge from the uterus, though ever so inoffensive, we may have reason to suspect an incipient, or, perhaps, a more advanced state of a schirrous of the womb. If patients were examined in this early state, by a skilful anatomist and an experienced man-midwife, well versed in the natural feel of the parts, the true nature of the disease might perhaps be ascertained.

I have been more particular in endeavouring to trace the beginnings of these uterine affections from an expectation that if they could be discovered in their early state, they would be much more likely to yield to the use of the hemlock bath, and the free administration of the flores martiales, joined with astringent injections, than other cancerous diseases. These expectations have been raised in me, not only by the experience of their effect in the preceding cases, but also by the accidental discovery of the great effect of the flores martiales in the liberal doses I have used them, in curing the fluor albus; a circumstance which I hinted at in the former part of this work. I am not ignorant that this medicine has been prescribed by many persons in this common but troublesome distemper; but it has been used in such sparing doses, that its great and peculiar efficacy has not been ascertained. A physician of great learning and eminence, to whom I had frequently communicated my thoughts on this subject, assured me that he had not met with any disease more rebellious than this. He also informed me that he had found the flores martiales the most effectual remedy against it; but having never given it in such liberal doses as are mentioned in this performance, this may have been the reason of his not having succeeded so fully as he might probably have done. My experience of it, indeed, is only accidental, and therefore not extensive, because these cases fall usually under the notice of the physician,

and belong properly to his province. Some few of my cancerous patients have informed me of their being completely cured of the whites while they were taking the martial flowers for their other complaints. One of them, I afterwards was informed, had had this discharge to a most violent degree, and had previously taken a number of medicines for it without the least effect. This circumstance induced me to try it in some cases of obstinate gleans in men, in which I have most frequently found it effectual, though not universally so. This may perhaps be accounted for, from the difficulty of prevailing upon men who are always running about, to confine themselves to a steady perseverance in swallowing a great number of pills every day.

Before I close this part of the work respecting ulcerated cancers, it will not be improper to give the prescription for making the liquid so frequently mentioned, as it is to be found in the writer from whom I took it*, with a short account of the performance that contains it. The pamphlet was published in Latin, at Vienna, in 1767, and is written by Francis Xaverius de Mare, who styles himself Doctor of philosophy and physic. The title of the book is, *Traëtatus Medico-chirurgico-chemicus, de canero et spina ventosa curabilibus per medicamentum hætenus secretum, nunc communicatum.*

From this title we see that the writer applies his liquid to the cure of the spina ventosa, as well as of the cancer. The account he gives of the nature and progress of these disorders, does not, however, contain any thing new or worthy of remark. There are only four cases adduced in support of the utility of its application, and three of these appear to be scrophulous, though he calls one a spina ventosa. His directions for applying the liquid, are to smear the edges of the fores and all the indura-

* When I first used this liquid, I had not the original book in which the prescription is; but copied it from a periodical work in which it was transcribed, and which Doctor Garthshore (the person from whom Doctor Morris had received his information concerning it) was so obliging to lend me for that purpose. A considerable time after this I had the original work imported from Vienna, being very desirous to see the whole of a performance from part of which I had reaped such advantage.

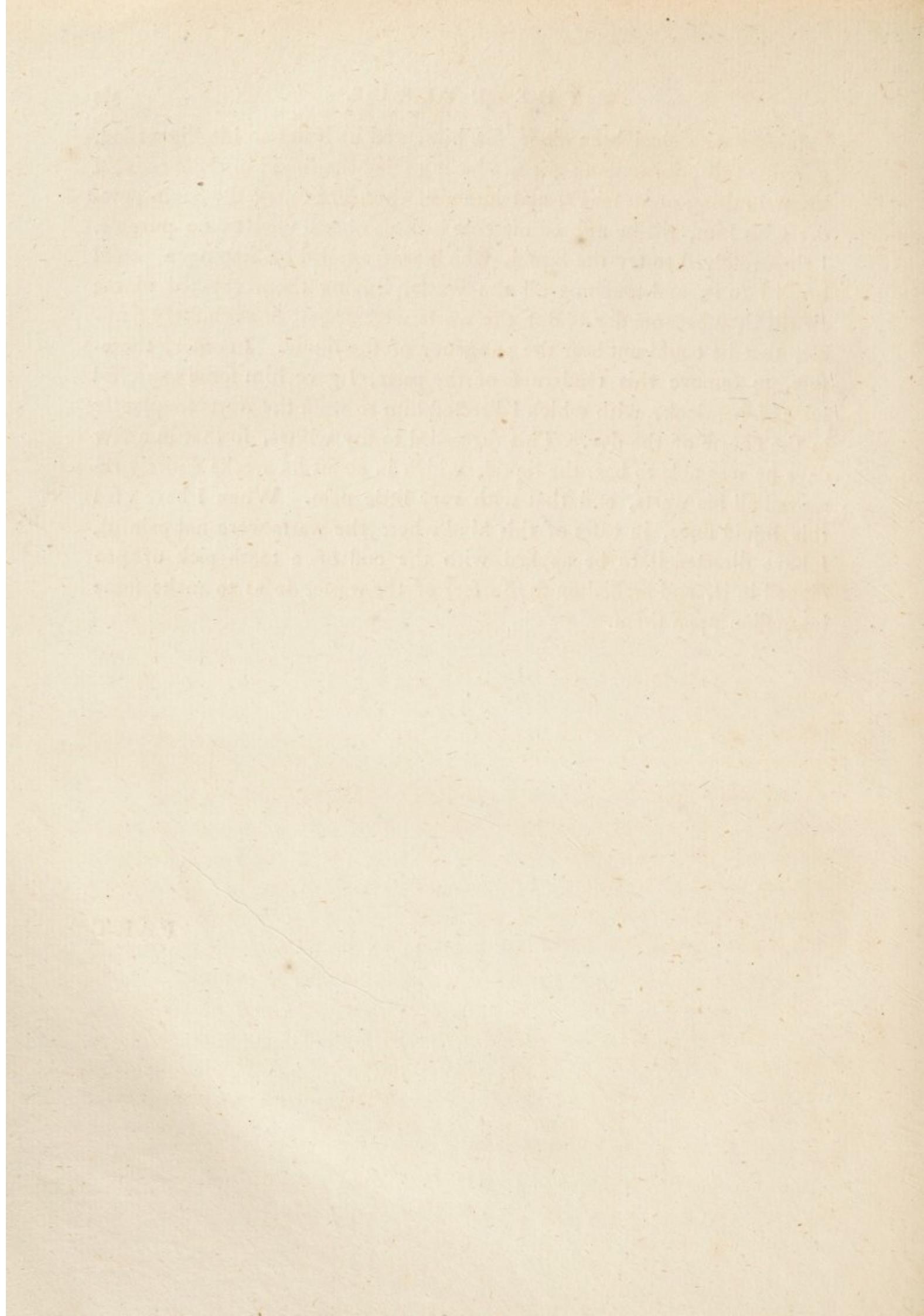
ted parts with it, by means of a pencil brush three or four times in the day, and to suffer the part to remain exposed to the air till the liquid dries upon it; so that he has not used it near so liberally as I have done since. His mode of preparing it I shall give in his own words *Ri. Ramentor. ferri lotor. et supra ignem in vase aperto siccatorum & minutissimè contusorum; salis armoniaci in pulverem redacti aa unc. iv. Mixta dentur in retortam terream optime in fundo et circumferentia lege artis munitam, imponatur hæc capellæ, admoveatur vas vitreum recipiens, quod bene lutetur: detur ignis in gradu digestionis, & dum retorta calefieri incipit; augeatur successivè ad sublimationis, finitaque sublimatione ad calcinationis gradum. Hoc facto successivæ refrigerationi committatur retorta, et ex refrigerata fractaque accipiat calcinatum in fundo hærens, caput mortuum teratur, et subigatur minutissimè in mortario lapideo, dein subactum imponatur in vas vitreum et affundantur spiritus vini rectificatissimi Empyreumaticum odorem non redolentis lbij. Agitentur sæpius primis octo horis: post viginti quatuor horas agitatis denuo instilletur tribus quatuorve interstitiis observatis, acerrimi, ut vulgo vocatur, olei vitrioli nigri unc. i.—ad quamvis instillationem semper mixta agitando; deinde in quiete permittantur per viginti quatuor horas, his elapsis decantetur tinctura, residuo vero in fundo affundantur prioris spiritus vini lbij. Agitentur iterum pluries, dein extractio de novo relinquatur per viginti quatuor horas; his transactis instilletur iterum, ut prius, olei vitrioli supra dicti unc. i. Effervescentia finita vero infundantur spiritus tartari sup' i-cis unc. iv. Agitentur et finita agitatione aliquoties repetita relinquatur in vase per viginti quatuor horas; his elapsis secunda hæc solutio misceatur priori decantatæ, et optime simul agitentur, tunc parata est ad usum PANACEA NOSTRA ANTI-CANCROSA.*

This is a very elaborate process, and it is evident that a tincture of the same properties might be made with much less trouble. But I chose not to depart from the prescription, and used it just as it is here set down. I varied it afterwards by omitting the oil of vitriol and the oil of tartar, where I did not think them necessary. My first motive, indeed, for employing it was the salt ammoniac used in it, but I am since convinced that

that the addition of the steel has a very considerable share in its virtues. Perhaps some may think that its effects depend entirely upon this last substance, that there is little of the salt ammoniac in the tincture, and that the only use of this salt in the process is to dissolve a greater proportion of the iron. However this may be, it is certain that this liquid, or one of a similar kind, is likely to prove a very serviceable topic, the use of which may hereafter be extended. For besides the evident advantages obtained from it in the first case described in this work, I have found it very useful in dissipating recent schirrous tumours, as will be shewn hereafter; in resolving cancerous indurations or checking their progress; and in alleviating the darting pain of the schirrus. It is also useful in softening the callous edges of ulcers, and in stopping the advances of putrefaction, as in the instance before adduced of the cancerous ulcer of the penis; and in another of a very large and most alarming anthrax or carbuncle between the shoulders, where it was used with remarkable success. But there is another disease which is frequently very troublesome, and against which this liquid seems to act with peculiar efficacy, this is, venereal warts. I never knew it fail in this complaint; but as it is a very common one, and often relieved by other means, I shall only adduce one instance of this kind, because it is of such a nature that it seems to put the superiority of this application in this case beyond a doubt.

In the year 1774, a young man applied to me who had been in St. Thomas's hospital with a confirmed lues. When he came to me, all his glans penis was totally surrounded and covered with warts, so that it exhibited the appearance of a cauliflower. These warts were extremely painful, and so large that he could not bring the prepuce over them. Having been under very skilful hands, every known method had been tried to cure him of this disagreeable complaint. He had been salivated, the warts had been fumigated with cinnabar, caustics both mercurial and others had been applied, but with no success. They had also been cut off close to their base, and notwithstanding every precaution taken to keep them down afterwards, they still sprouted afresh, and grew to their former size, so that they were deemed incurable. I was very careful in
inquiring

inquiring what had been done for him, and he being an intelligent lad, gave me full information ; for not having tried the liquid in these cases, I knew nothing of its effect, and intended therefore to try the Savin powder with him, till he assured me that had also been used to no purpose. I then resolved to try the liquid, which was applied by dipping a pencil brush into it, and touching all the warts, leaving them exposed to the air till they became dry. But the warts were at first so exquisitely sensible, that he could not bear the pungency of the liquid. In order, therefore, to remove this tendernefs of the parts, I gave him some expressed juice of hemlock, with which I directed him to wash the warts frequently in the course of the day. This succeeded to my wishes, so that in a few days he was able to bear the liquid, which in about six weeks entirely removed all his warts, and that with very little pain. When I have used this liquid since, in cases of this kind where the warts were not painful, I have directed it to be applied with the end of a tooth-pick or pen dipped in it, and pressed on the surface of the warts, so as to make some impression upon them.



P A R T II.

OF THE TREATMENT OF SCHIRROUS TUMOURS OR OCCULT
CANCERS.

I NOW proceed to communicate the methods I have used in the treatment of schirrous tumours, and give an account of the good or bad success that has attended them. In doing this it may not be improper to observe, that I shall have occasion to mention three cases of recent indurations immediately consequent upon the milk abscess of the breast, but as I treated them in a different manner from that in which I usually treat these last complaints, and indeed was obliged to treat them differently, I think myself authorized to consider them as incipient schirrous tumours.

The first case of the schirrus that presented itself was that of M. Perin, an old woman between fifty and sixty, who, in the year 1772, was made an out patient in the hospital, under my care. The late Doctor Brickenden had for a considerable time tried several things to relieve her with no effect. She had been troubled for some years with two schirrous tumours in the left breast, which, when she applied to me, were

both very large and hard, one of them as big as my fist, and which had latterly become very painful. Both the tumours were loose, but the largest of them formed an angular projection, which was near the surface of the skin, and appeared likely to adhere to it at that spot. This woman never did any thing more than take the flores matiales very freely, and apply to the tumours a large piece of doubled linen dipped in the liquid, which she renewed several times in the day. She certainly used this liquid more freely than any other patient who ever tried it, for her skin not being tender she was able to bear it much better. Add to this, that in a few months she found herself so much relieved from the pain of the disease, that she paid little attention to the smart of an application from which she experienced so much benefit. She persevered with great resolution, and with very little intermission, in the use of these remedies for upwards of a twelvemonth; at which time she was entirely free from any kind of pain; and the tumours were so considerably decreased in every respect, that they were reduced to much less than a fourth part of their former size. The least tumour was, indeed, scarce perceptible, and the largest was almost flat, and was divided by several chops or fissures under the skin, which made it feel as if it were cracking to pieces. The angular projection was removed from the skin, to which there was now no danger of an adhesion being formed; and the tumour was so remarkably softened that it felt rather like a piece of wet and rumpled rag in the breast than like an indurated gland. It was pleasant to see how evidently this woman recovered her health, which was in a very languid state when she first applied to me, and how lively and full of spirits she became; an effect which I have always observed to follow whenever the martial flowers were taken freely for any length of time. But this was all the advantage I was able to gain in the case; it was never possible for me to dissolve the tumours entirely; they remained in the same indolent and quiet state till the time of her death, which happened about two years after this, from an illness totally independent of the complaint. She had, indeed, done nothing for a considerable time before she died, except that she used the liquid now and then, which seemed to contribute

to

to keep the part in the same state it was in, a little more than a year after she began the process.

Mrs. H. aged 30, applied to me on the 19th of October, 1773. She had been seized with a fever nine days after her lying-in. This brought on an abscess in the left breast, which got well in about a fortnight, and when the discharge was nearly stopped, she found a swelling come on in the right breast. It was then very painful and much swelled even under the arm-pit. Linseed and bread and milk poultices had been assiduously applied for more than two months, which though they alleviated the pain, yet still the swelling remained invariably the same. When I examined her, there was an oblong indurated tumour, very hard to the touch, about four inches in length, and extending across the nipple. Imagining this to be a milk breast, I tried at first the application I commonly used in those cases, and of which an account shall be given in the third part of this work. It was continued more than a fortnight without producing any sensible effect. But as it was not usual with me to see that application persisted in so long in milk breasts, without perceiving some alteration, I supplied my patient with some of the liquor before described, directing her to dip a double rag in it, and lay it all over the tumour, and to wet the rag as often in the day as the skin would bear it; taking the precaution of guarding the nipple either with a piece of dry lint or a pledget of some soft ointment, lest the liquor should excoriate it. In a few days the tumour began insensibly to melt away, and in less than three weeks had totally disappeared.

Ann Highland, aged 29, came into the hospital in the year 1773, with a large indurated tumour in the breast, eleven months after giving suck to two children. In the beginning of the eleventh month the children were seized with the small pox. Soon after this she perceived a swelling in her breast, which in three weeks burst into five different apertures, and discharged a small quantity of matter. She used a bread and milk poultice for more than two months without effect, before she applied to me. When I saw her, all the original orifices were still open, and there

was a large indurated gland in the midst of the breast: there was also a swelled gland under the arm-pit. She suffered extremely with the pain of this complaint, which she described as of the pricking, darting kind. The sores were all sloughy, and of a purple hue. Though it be frequent to see the sores have an ill-conditioned aspect, in milk-breasts that are treated with bread and milk poultices, yet I never saw any of them with so very bad a look as these, so that, indeed, I was alarmed at the appearance. Whether this circumstance were owing to the virus of the small pox I cannot determine. It induced me, however, not to consider this as a mere milk breast, more especially as the complaint had come on so long after lying in, and I therefore directed the patient to use the liquid as the former had done, not even covering the sores with any thing else. This application was renewed five or six times in the day, as often as she could bear it, for it smarted much on being first applied, and the smart lasted about an hour. In a few days she found much relief from the pain: and the first and almost immediate effect of the application was, that the milk flowed plentifully with the matter from all the sores, and from the nipple. In a short time the sores were all healed, and in a month the enlargement of the gland under the arm-pit was dispersed, and the large swelling itself considerably diminished. This induration, however, still subsisted; but as she was now entirely free from pain, and desirous of returning to her family, she went out of the hospital, and by persevering in the use of the liquid six weeks longer, was perfectly cured. The free discharge of milk occasioned by the first application of the liquid in this case, indicated that there was a coagulation of that fluid attending this complaint. But the symptoms above described, the form of the tumour, the looseness of the cellular substance of the breast, which in this case was entirely free from induration, and the continuance of the pain, though a free issue was given to the matter by five openings (a circumstance which usually procures ease in milk breasts), and the time, near three months, employed in getting rid of the disorder, induce me to think that it partook more of the nature of a recent schirrous tumour.

Mrs.

Mrs. B. aged 30, applied to me at the desire of Mr. Jarvis the surgeon, on the 11th of November, 1773. She had lain in six months before. A fortnight after her lying-in, she had her right breast disordered from a coagulation of the milk. This complaint lasted about two months, and as that breast got well a hardness was formed in the other, which suppurated and discharged a great quantity of matter. The wounds healed, but left an indurated tumour, which sometimes partly disappeared and came again. It returned about two months before she applied to me, bursting again, but the wound had been closed about a fortnight before. When I saw her, there was a considerable induration extending almost over the whole breast. It was hard to the touch, in some parts unequal, and attended with much pricking, darting pain at intervals. This was treated as the former case. The pain soon went off, and the tumour lessened, but it was near four months before it was completely dissolved.

In the month of May, 1774, I was consulted by an eminent and learned physician on account of his lady, who was afflicted with a scirrhus tumour of considerable standing. Upon examining the part, I found the swelling remarkably hard and stony, and so large that it occupied almost the whole breast, and extended towards the arm-pit. The pain was very acute, and, indeed, she complained of wandering pains over the whole body, which made her life very uncomfortable. About the middle of the tumour, towards the nipple, the skin adhered to the surface, and was already discoloured, so that this scirrhus would certainly have burst very soon, and have become an ulcerated cancer. I acquainted the physician with every thing I had already done in these complaints, and with the methods I intended to pursue with his lady, merely in the view to give ease, check the progress of the disorder, and prevent the tumour from ulcerating, which was all I expected to do in this case. He approved of my plan; and accordingly the patient was put into the hemlock bath, she took the flores martiales as freely as she could, and applied the liquid externally. Every advantage we had promised to ourselves was obtained. The patient was much relieved from pain, the tumour was softened and diminished in size, and it was kept from bursting, which it
most

most probably would have done in the course of a few weeks. This amendment continued a longer time than we had any reason to expect from the state of the disease, and the age of the patient. In a word, from the time the relief began to be apparent, which was after persevering about three or four months in the methods prescribed, she remained upwards of a year in a very tolerable state. It was not till the autumn or beginning of the winter 1775 that her pains seemed to return with more violence than she had felt them for some time. The tumour, however, was not yet burst, but there now appeared a vesicle of blood immediately under the cuticle, which seemed once more ready to make an opening. Upon considering the alteration made in the tumour, which was much diminished from its former size, I ventured to accelerate the bursting of the cuticle, and therefore emptied the vesicle of blood by passing a lancet into it, in order to try, whether by the use of the arsenical caustic, applied with such a proportion of opium as not to make it act with violence, I might be so happy as gradually to remove the whole of the tumour. But whether the state of the disease would not admit of this method of treatment, or whether my patient's age was unable to bear the labour of such an operation, I cannot take upon me to determine. It is certain, however, that she fell a victim to the disorder in the beginning of the year 1776.

While I was attending this lady, one of the servants in the family applied to me with a recent schirrous tumour in the breast, attended with frequent pain. This was removed in a short time, merely by the application of the liquid.

In the number of schirrous cases I have attended, there are several, the progress of which has been checked in as evident a manner as in the preceding case. This has been remarkable in one very deplorable instance of the kind. There is a species of schirrus, which seems not sufficiently distinguished by writers on this subject, and may be well stiled the true occult cancer; is more malignant in its nature, more terrible in its effects, more rapid in its progress, and more certainly fatal than any other. Whether it may differ in its nature from other cancers I cannot tell,

tell, but I rather imagine that its peculiar malignancy arises from its seizing upon a large portion of the animal machine at once, and not advancing by slow degrees, and from almost imperceptible beginnings, as the more frequent indolent schirrus or creeping cancer does. One of the distinguishing marks, indeed, of this disease, is the whole substance of the breast being suddenly attacked with a stony and almost immovable hardness. The disease is sometimes confined to this part at first, sometimes extends to the arm-pit, the neighbouring ribs, the clavicle itself, and the glands of the neck. The pain of the disease is exquisite, scarce to be moderated by the most powerful opiates, and the patients describe it as the constant gnawing of dogs. I cannot avoid taking notice that in the few women I have seen tortured with this disease, I have observed, that the pores of the skin were uncommonly large, of which I have certified myself more particularly, by looking at the part with a good lens, and comparing the appearances with those of the cancerous affection in other skins, the texture of which seemed more firm and compact. This circumstance, if upon examination it should appear to others as it did to me, may possibly be admitted in collateral support of the conjecture ventured in the preceding pages, that the cancer may proceed from the introduction of insects or their germina through the pores of the skin. However this may be, it is a fact, that I never saw any of these dreadful cases relieved by any method hitherto pursued. Even the operation, though practised at the most early period, and before the disease appeared to have extended itself beyond the part, has never succeeded in these cases to my knowledge. The fate of the patient, indeed, is in general soon decided. From six weeks to two or three months, or at most six, are generally the limits of it.

I was called to a lady with one of these occult cancers, in the year 1774. Besides the whole breast being indurated in the manner before described, there was a schirrous gland lying deep in the arm-pit, which occasioned the arm to swell, though the disease was very recent; and there was also an indurated fixed tumour above the clavicle. A surgeon of remarkable sagacity and extensive practice had seen this case a few days before

before me. He was too well acquainted with the fatal prognostic of this disease, which he thought would terminate in a few weeks, not to give warning of it to the patient's friends. But even in this terrible case the pain was evidently diminished by the hemlock bath, and the rapid progress of it seemed, for a while, to be checked. But these deceitful hopes did not last long, for she died about seven months after she had been under my care.

Upon examining the body after death, the breast was found strongly adhering to the ribs, some of which were carious. The cancer had even penetrated the cavity of the thorax, and affected the internal surface of the pleura. Most of the clavicle was totally rotten, and fell to pieces upon the touch, besides which, there was a large cancerous gland in the groin on the opposite side to that where the breast was affected. The stench, too, was almost intolerable, though it had been very trifling while the patient lived, and that no kind of smell was perceived till near the period of her existence.

One remarkable effect happened, which I shall here take the opportunity of mentioning, and which I attribute to the hemlock bath. It was observed only in this and two other cases, where the disease was extensive. I mean the formation of an abscess, some few months after the bath had been used. In the fore-mentioned case, the abscess was formed in the fore-arm of the diseased side; in another, under the arm-pit of the opposite side; and in the third, in the groin of the opposite side. From these circumstances, and the large suppurations brought on by this bath in two of the cases of ulcerated cancers before mentioned, we may presume, that the quantity of hemlock absorbed by this mode of introducing it in the habit, must necessarily quicken the circulation, and put all the fluids in agitation, by which means these suppurations are probably brought on. It may be observed, by the way, that these effects seem very contrary to paralytic affections, which some learned men think the hemlock has a tendency to produce. For my own part, in all the numerous instances in which I have employed this plant, and in the free use I have made
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of it, I never yet observed any paralytic symptom to arise from it, nor indeed any other bad symptom, unless these suppurations should be deemed so, which however, it must be remarked, healed very kindly after having been opened, notwithstanding the cancerous disease prevailing in the habit.

Finding many of these schirrous cases obstinately resist every method employed for their cure, though they were most of them relieved, I was induced to try the effect of an arsenical plaster to them, encouraged by the evident advantages I had seen to result from the external use of the arsenic in cancerous ulcers. For this purpose, I chose to employ the mildest preparation I had of this mineral, and therefore had some of the yellow powder, described in the former part of this work, mixed with suet and other ingredients to the consistence of a pretty soft plaister. The preparation itself was mild, as we see it contained no more than one grain of arsenic to four of sulphur, and that so much weakened by this combination, that it has been observed I had given internally a quantity of this powder, containing five grains of the arsenic, with greater security than I could give one grain and a half of the crude mineral. Besides this, the preparation would be still weakened by the addition of the ingredients necessary to form it into a plaster; so that I had not the least reason to suspect this application would be attended with any bad consequence. Neither, indeed, do I think it would, had it not been for an accidental circumstance, which I confess I did not foresee. This plaister was applied to six different patients at the same time, and in a little while, the schirrous tumours afforded such evident marks of diminution, that I had every reason to be satisfied with my having thought of this application. I afterwards tried it in another case, where my patient was at the same time using the hemlock bath. But here some paralytic symptoms began to shew themselves so imperceptibly at first, that I was not aware of the danger till it increased beyond the power of relief. I could scarce persuade myself that such an effect could be produced by this mild arsenical plaister, till another patient who had applied it for some months with great hopes without using the bath, was at length seized with very disagreeable complaints in the bowels, upon going into the bath, while she used the arsenical plaster.

She was, however, relieved from this attack ; but these instances convinced me that the warm water, by opening the pores, had occasioned too great an absorption of the arsenic, and had perhaps contributed to separate it from the sulphur ; without which process I presume these symptoms could not have been brought about. However this may be, though my other patients who used the same application, and did not go into the warm bath, had not suffered any disagreeable symptom, and that I had every reason to wish to continue it with them, yet I determined to lay it aside, fearing lest some accidental circumstance, which it was impossible for me to foresee, might separate the arsenic from the sulphur, or encourage a too liberal absorption of it. I therefore immediately collected from my several patients all that remained of this arsenical plaster, and threw it away, determined never to use it more.

In one of the schirrous tumours, in which I had tried the fore-mentioned methods without success, I resolved to attempt the extirpation of it by the arsenical caustic. My patient was extremely timorous, and would by no means be persuaded to submit to the operation by the knife. She had a very hard stubborn schirrus in the right breast just above the nipple, of the size of a small apple, and beyond this a small indurated gland under the axilla. The arsenical preparation I used in this case was composed of one third of antimony, and two thirds of white arsenic fused together. This being reduced into impalpable powder, a few grains of it were mixed with as much powdered opium. But as the skin was entire, and as I knew the arsenic would not act through the cuticle, the day before this powder was applied I rubbed the whole surface of the gland gently with the lunar caustic*. By this contrivance the cuticle was easily

* I did not know whether Plunket's powder acted through the cuticle, or whether he had some method of separating this part, in order to make way for the action of the arsenic. But I am inclined to think that this effect is produced in his powder by the crow's foot, which is said to enter into its composition, and which is a very acrid and pungent plant. My method will, perhaps, be thought preferable, as the touching the entire skin with lunar caustic is not painful, whereas the action of so irritating a vegetable I should imagine must add considerably to the pain of the application. On the other hand, I believe Plunket's powder is quicker
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easily separated next day, when mixing a small quantity of the powder with part of the yolk of an egg, so as to bring it to the consistence of an ointment, I spread this upon a pledget cut to the size of the gland, and applied it to the whole surface. The pain was very great for the first four and twenty hours, but after that subsided. I left this first dressing on for several days, when seeing it ready to drop off I removed it, and found that all that part of the skin on which the caustic had been applied was cracking all round and the tumour beginning to separate. In expectation of facilitating this separation, I made a few scarifications on the destroyed surface, and filled the crevices with more of the powder, applying over it a pledget of the same kind as the former. But this second application did not as I imagine produce any effect, for it caused no pain. I then waited a few days to observe what would happen. The separation began to take place more evidently at the edges, which now looked florid, though the tumour did not yet seem ready to come away. To hasten this event, I judged it proper to put some of the powder all round the separating edges, and as low down as it could be insinuated between the diseased gland and the sound skin. I soon found that this contrivance had its effect, for the pain it occasioned was more violent than that produced by the first dressing. I was, however, obliged to repeat the application of the powder to different parts of the edges at intervals, but never in so large a quantity as before. By this method the separation of the tumour was effected in little more than two months, and the gland came out entire as a nut out of its shell, or as if it had been cleanly dissected with a knife. The small gland under the arm-pit I had put nothing to, thinking it would dissolve by the suppuration of the larger one, but in this I was mistaken; it still remained; but this circumstance did not prevent the wound made by the separation of the larger gland, from healing very fast after it had come out. Seeing the small gland still exist after the healing of the wound, contrary to my expectations, I was very sorry I

in its action than this preparation, because in his, the arsenic and sulphur, though used in equal quantities, are incorporated in their crude state by mixing them in a mortar, without being exposed to the action of fire, as the arsenic and antimony are in my preparation.

had not treated that in the same manner as the large one, and at the same time; which might have been done with great ease, for it was so small that the patient would not probably have received much additional pain from it. I endeavoured to persuade her to let me apply the caustic upon this little swelling after the wound was healed, but I could not prevail. She was so well satisfied with having got rid of the most material part of the disease, and being freed from the pain which that gave her, and so fearful of going through the same violent pain again, that she chose rather to remain with it as it was. I saw her about a year and a half after this, when she was in perfect health; the little gland under the arm-pit remained, but it was neither increased nor decreased in size. She suffered no pain from it, and there was then no other appearance of the complaint.

This is the only instance in which I ever attempted to *draw out* the schirrous gland, as it is vulgarly called. I have heard some eminent physicians say, that it was a desideratum in surgery to know how to do this as Mr. Guy did. Whether Mr. Guy's method be the same as Mr. Plunket's was, as it is imagined, I cannot take upon me to determine. I shall only observe, that here is an instance of the same thing being done by a method very different from Plunket's, though essentially perhaps the same, with regard to the chief remedy that seems to produce the effect. That effect, by which ever of these methods it may be brought about, or however painful may be their operation, is certainly a very surprising one; and may be of advantage, not only with respect to many timid persons who cannot reconcile their minds to the terror of the knife, but may also be of utility in some cases where the knife cannot be used with safety. I shall be happy if the advances I have made in this point should induce my brethren to turn their thoughts to this kind of operation, which, if it were once rescued from the hands of empiricism, might not only become more certain under the directions of a man of learning, attention, and experience, but might probably be rendered more mild in its effects. To facilitate the attempts of others in this matter, I shall observe, that I was not satisfied with my method of doing it, though
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it succeeded. I thought the operation too slow, and that I was obliged to renew the application too often, which not only prolonged the pain, but likewise made it necessary for me to use a greater quantity of arsenic, and to continue it for a longer time than I could have wished. It might perhaps succeed better if the powder were made more active. For this purpose I should prefer the crude arsenic to that which has been fused by heat. Neither is it necessary perhaps to blend it with sulphur, which only serves to weaken its operation; for a very small portion of arsenic when mixed with the yolk of an egg may be applied to a pretty large surface; and if we wish to divide its particles and spread a small quantity over a larger surface, this may as well be done by adding some testaceous powder to it, which will have this effect without altering its properties. I would also recommend the corrosive sublimate to be joined to it, for although this combination quickens its operation very considerably, yet I am convinced from experience that it adds very little, if at all, to the pain caused by the arsenic. One thing further I must observe, which is, that when a scirrhus gland becomes ulcerated in one part, and that the induration subsists with the skin entire much beyond the ulceration, the application of arsenic in this case upon the ulcerated part of the gland seems to act no more than any other caustic does, except that its effect may be more extensive, and destroy more of the gland. But it does not, as in the instance just recited, dispose the gland to separate from the sound parts. This action seems to depend on the application of the arsenic to the sound skin when deprived of its cuticle. The mineral seems then to act by bringing on inflammation and suppuration in the cellular membrane all around and underneath the diseased gland, which is thus forced out entire and unaffected by the caustic. This is a material point to attend to, and which I have learned only from disagreeable experience. If any one, therefore, be desirous of applying the arsenic to an indurated gland, which is ulcerated in the middle, in the expectation of separating the whole gland at once, he must extend the application all over the indurated part, after having deprived the surrounding skin of its cuticle, either by a blister, or by the method made use of by me in the above instance, which I think preferable, as being less irritating. Perhaps it may

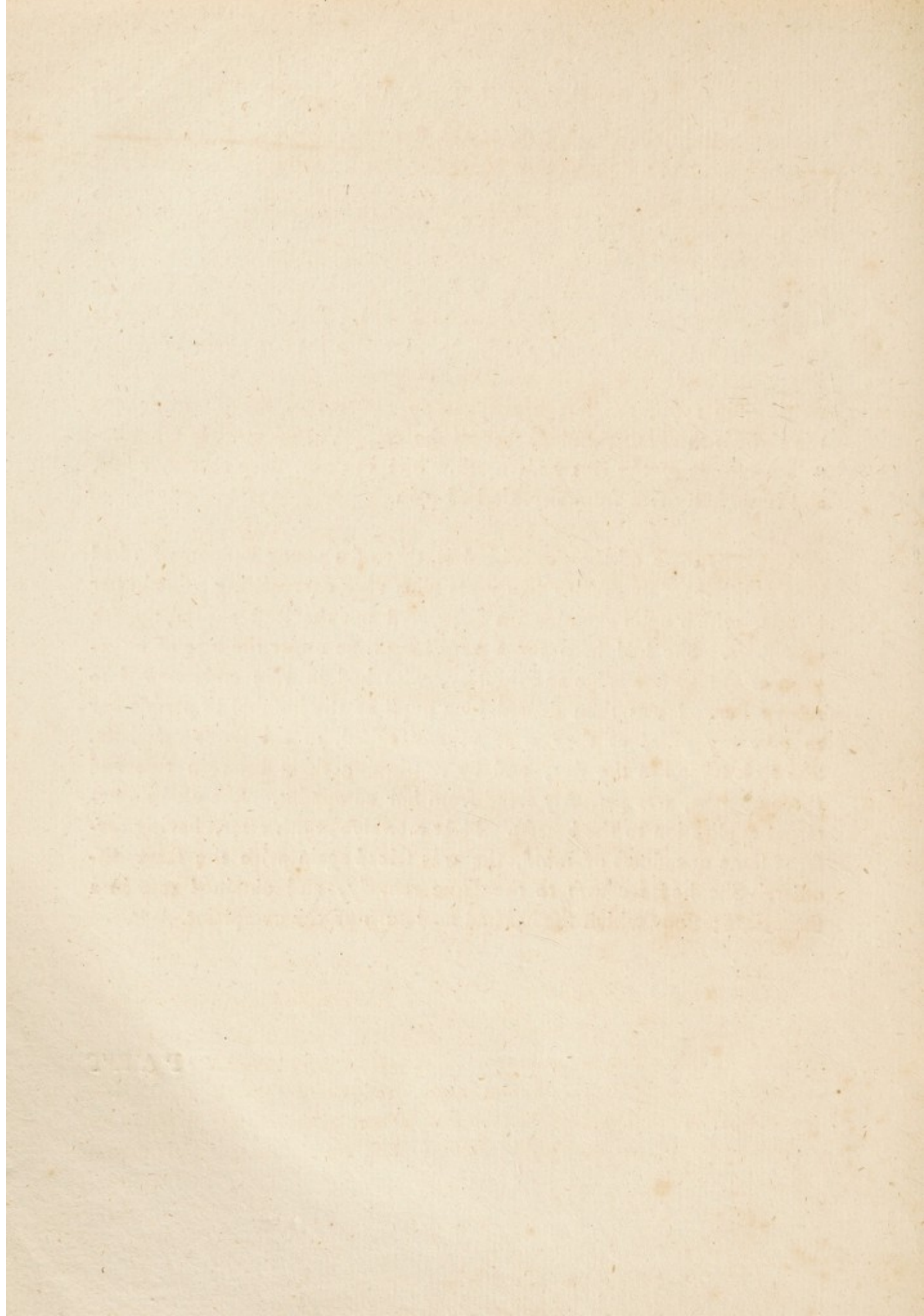
may hereafter be found only necessary to make a circle round the whole tumour for the application of the arsenical caustic. If this should succeed, which is not improbable, from considering the effects of this caustic, the utility of this method may be extended to cases, where, from the extent of the complaint, it would not be safe to use it in the present mode, and that for obvious reasons. This is, however, merely a conjecture; and I sincerely and ardently wish that these, which are all the observations I have been able to make upon the use and effects of arsenic, may lay the foundation of other more important discoveries, which may hereafter tend to the improvement of surgery, and the benefit of mankind.

Before I quit this part of my subject, it will not be improper to take notice of a disorder in the breast, to which I know not what name to give. It cannot be called a schirrus, for it is not attended with any sensible external mark of swelling; neither can it be deemed an ulcerated cancer, for there is no sore accompanying it. But from the nature of the pain complained of in this disorder, and other circumstances, it appeared to me to have a cancerous tendency.

On the 24th of April, 1775, Mrs. B——, of the Temple, consulted me for a complaint in both breasts. She had for a few years been afflicted with a violent aching pricking pain in them, which had lately increased to so great a degree, that it was almost intolerable. The breasts were exceedingly sore to the touch, so that she could not even bear the natural weight of them; and for two years before had not been able to lie in bed on one side or the other, but was obliged to sleep in a supine posture with her arms folded so as to support them. Notwithstanding these symptoms, upon examining the breasts, I could not find any evident marks of a schirrous tumour in either of them. The texture of the glands seemed, indeed, to be rather firmer than it ought to be. This patient had been ten months under the care of another surgeon, but nothing he had done for her had given her the least relief; on the contrary, her pain was become greater and more constant. She persevered for a
twelve-

twelvemonth in the internal use of the flores martiales, and the external application of the liquid, without much benefit, except that she found the complaint rather more tolerable. At length I prevailed upon her to try the hemlock bath, which she began to use in the month of May, 1776. She went into the bath twice in the course of a week, and when she had continued for three months, found more relief from this than she had done from any thing she had tried before. She persisted in the use of this bath till Christmas, 1776, began to go into it again in April, 1777; and continued till November in the same year. At this present writing, in 1779, the left breast has no remains of the disorder; and the right is so much mended, that all she complains of now, is a tenderness upon one of the ribs underneath. She can now sleep on either side, and is perfectly free from any kind of pain.

The other case of the same kind is that of a young woman who had been afflicted for more than two years with very excruciating pains in her breasts, which upon examination discovered not the least apparent mark of disease. She had been for a very long time under the care of a surgeon of great knowledge and sagacity, who had in vain endeavoured to relieve her. I was then desired by a pupil of the hospital to permit her to take my pills, as they were usually called, of the flores martiales. She took several in the day, and by continuing them between two and three months, was perfectly freed from her complaint. She used no external application to the breasts. Near a twelvemonth after, having suffered some uneasiness of mind, she was seized again with the same disorder. She had recourse to the same remedy, and obtained ease in a short time; since which she has had no return of the complaint.



P A R T III.

ON THE METHOD OF TREATING THE COAGULATION OF MILK
IN THE BREASTS OF WOMEN AFTER LYING-IN, COMMONLY
CALLED THE MILK BREAST, AND THE ABSCESS IN THE
BREAST, WHICH FREQUENTLY SUCCEEDS IT.

THIS is a complaint made very light of by most practitioners in surgery, from a supposition that it always gets well in time without any thing being done to it, except keeping the part covered with a large bread and milk poultice, and that it never degenerates into a schirrous tumour or cancer.

I cannot help thinking, that this is a misconceived opinion. Besides the testimony of Astruc (which I shall soon take particular notice of) and many other writers in support of a contrary opinion, experience has shewn me some instances of very malignant cancers which were traced by the patients themselves from a milk abscess in the breast, without any interruption of the complaints, till they had arrived at the bad state in

which I first saw them *. It is probable too, from all that has been said before, that the recent indurations mentioned in the second part of this work, and which succeeded the abscess of the breast, would have laid the foundation of some cancerous affection had they not been removed.

One argument advanced in support of the indurations of the milk breast not degenerating into a schirrus, is, that they are diseases of different parts; the schirrus being a hardness of the mammary glands, and the other complaint being merely an induration of the cellular and adipose membrane of the breasts. This I apprehended to be a position erroneous both in itself and in the consequence deduced from it. For the disease being acknowledged on all sides to consist originally in a coagulation of the milk, it follows that it must necessarily exist in those parts destined by nature for the secretion, receptacle, and conveyance of that fluid; which are the mammary glands, and the lactiferous tubes proceeding from them. These lactiferous tubes pervade the whole substance of the breast, and I presume it is by their being distended with coagulated milk, that the cells of the cellular substance become compressed on all sides, so as to exhibit the appearance of the induration being seated in them. It may be urged, indeed, that this compression of the sides of the cellular substance being continued for a long time, the cells will not be able to recover their tone, even though the obstruction of the lactife-

* I have generally observed too that the schirrous tumours I have seen, which were traced from the milk breast, were always of a more irregular angular form, and flatter than other schirrous tumours, which could not be apparently traced from the same cause. It should seem, therefore, that the schirrus succeeding the induration of the milk breast, adopts the same kind of form that it had before its degeneracy. This diversity of form, indeed, has been considered as one of the distinguishing marks of this disease; but I cannot think that the round or regular oblong figure is a characteristic of the true schirrus, which puts on all sorts of forms. Perhaps, if the observation here laid down should be made by others, we may at last come to distinguish those kinds of schirrous tumours that succeed the induration of the milk breast, from others. Whether such a distinction will be of any use in practice I cannot tell; but from all I have been able to observe upon this matter, I am inclined to think, that these irregular schirrous tumours are more obstinate than those which are round and smooth.

rous tubes that run through them should be removed; and that the induration will therefore still subsist. Whether this be the case or not, which it is impossible to determine, yet, admitting that the induration existed only in the cellular membrane, this would be no sort of proof that the complaint would not degenerate into a schirrus or cancer. For all ulcerated cancers are accompanied with indurations of the cellular and adipose membrane, which, indeed, is one of the strongest marks of the true cancer. These schirrous hardneſſes of the cellular membrane are indeed as difficult to cure as any other part of the diſeaſe; and from the conſideration of that dreadful ſpecies of ſchirrus or occult cancer deſcribed in the ſecond part of this work, which ſeizes the whole ſubſtance of the breaſt, ſeem to be of a more malignant nature, than a ſchirrus of the mammary glands alone. So that in whatever point of view we may conſider the affection of the milk breaſt, whether as a diſeaſe of the mammary glands and of the lactiferous tubes proceeding from them, or merely as a diſorder of the cellular and adipose ſubſtance of the breaſt, it is equally poſſible that it may degenerate into a ſchirrus or cancer.

It muſt be acknowledged, however, that the inſtances of this degeneracy are rare, when compared with the number of perſons who are troubled with the milk breaſt. Neither is it neceſſary to ſuppoſe that the diſeaſes, though ſeated in the ſame parts, are originally the ſame. The milk induration ſeems to become a ſchirrus merely from inattention, neglect, or improper treatment. But the poſſibility of ſo dreadful an event calls for every exertion in our power to prevent it. The learned Aſtruc obſerves, that abſceſſes of the breaſt often leave indurations of the glands, when ſome of the obſtructed part remains unſuppurated*. This ſeems to be the exact ſtate of the caſe, and, like moſt of that accurate author's obſervations, very juſt. The matter is brought about, as I apprehend, in the following manner, which, if it be really the caſe, will ſerve not only to account for the variety of opinions on this head, but alſo to reconcile them. I have ſeen theſe complaints laſt four, fix, eight

* On the Diſeaſes of Women. Book IV. chap. 4. p. 324.

and ten months when treated by the constant application of a bread and milk poultice, and when at length the abscess has been healed, and there has appeared no further disposition to suppuration, the complaint has been considered as cured; and though there should remain *some of the obstructed part unsuppurated*, yet there being no more pain, it is concluded, that these remains will go away of themselves, merely by keeping the part warm. This, indeed, does frequently happen; but it also happens sometimes that the patient finding such great difference between her present state, and that when she was exposed to the sufferings occasioned by a fresh abscess collecting and bursting every three or four weeks, perhaps for months together, thinks herself well, and neglects this trifling induration; which may, at the same time, be so small as scarce to be distinguished by an unskilful touch. Should she chance to feel a little pain in it now and then, she attributes this to the change of weather, or possibly to the necessary consequence of what she cannot but have considered as a grievous complaint. Thus the disease being neglected, may remain for a long time in a tolerably quiet state, till some accidental circumstance puts its virulence into action. Even then it may continue for a long time almost imperceptibly increasing, till it shall arrive to such a height as to be no longer mistaken. This event may take place at so considerable a distance of time from the formation of the abscess in the breast, that this complaint shall no longer be remembered as the cause.

But even setting aside these considerations, it must be owned that the coagulation of the milk, and the subsequent formation of matter in the breasts, is a disease attended with so much pain, and frequently of so long duration, that the health is often impaired by it*. It is a very disagreeable thing to see a woman labouring for several months under a teizing and painful disorder, which for the most part may be prevented, or the duration of which may at least be considerably shortened. The consideration of these circumstances, led me to turn my thoughts upon finding

* Abscesses of the breasts are a long and painful disease, long in forming, and long in curing. Astruc on the Diseases of Women. Book IV. chap. iv. p. 323.

a more expeditious mode of treating these complaints. On looking over my manuscript papers, I found in some notes taken from the late Doctor Didier's* lectures on the *Materia Medica*, that salt ammoniac dissolved in Hungary-water, was said to possess the property of keeping the milk fluid. I determined to make the experiment the first opportunity. In the mean while I tried how much salt ammoniac a given quantity of Hungary water would dissolve, and found that water alone took up a much larger quantity of the salt, and kept it suspended better than the spirit. Supposing that the virtue of the application resided chiefly in the salt, upon the first occasion I used it in the following manner. I directed three ounces of salt ammoniac to be dissolved in a pint of common water, to which an equal quantity of Hungary water was added. Rags dipped in this liquor made a little warm, were applied to the whole surface of the breast. These rags were wetted again as often as they became dry. The first case I tried this application in, was a coagulation of the milk soon after lying-in, before any suppuration had been formed. I soon found the confirmation of Doctor Didier's assertion, that this solution had the property of keeping the milk fluid; for, after it had been applied a few hours, the grumous feel was dispersed, and the breast restored to its natural state, while the milk flowed freely from the nipple.

I tried the same method in a great number of cases where I was called in before the suppuration was formed, and never yet knew it fail. Among others, Mrs, H——, who had suffered so much from one of these complaints, and whose case stands the second in the second part of this treatise, was brought to bed about a year after I had first attended her. Her husband having received a violent bruise on the ankle, sent to consult me. The first day I saw him happened to be the day after she had been delivered. I found her very much alarmed, and dreading the former sufferings she had gone through; for her breasts were now as much swelled

* As I have occasion to mention that gentleman's name, I cannot avoid paying a tribute to the memory of genius, industry, and a number of amiable virtues, which he possessed in an eminent degree. His premature and much-lamented death deprived society of one of its most valuable members, and the profession of one of its best ornaments.

and painful as they had been at her preceding lying-in. I directed her to apply the solution of salt ammoniac in water, and Hungary water, as mentioned above, and when I saw her the next day she was perfectly free from pain, and the coagulation dispersed. She continued the application, however, at my desire, for a couple of days, and had no return of the complaint. The circumstance of this swelling yielding so readily to the solution of salt ammoniac, which produced no effect on the former swelling in the same patient *, seems to establish the difference between these two complaints, and to shew that the former was beginning to degenerate into a schirrous tumour. But there was one case of the milk breast in which this method was tried, and which was of so remarkable a nature, that I hope the reader will not think I trespass upon his patience in giving an account of it.

In the year 1776, Joseph Smith, servant to the Duke of Montague, desired me to visit his wife, who, he said, had a bad breast. I went immediately, and found, that having been brought to bed the preceding day, she was seized with a coagulation of the milk of such a kind as I never saw before. The size of the breast was immense, the pain to the highest degree excruciating, the glands under the arm-pit swelled, and in a word, the whole disease so violent, that she was unable to move the arm on that side. Her pulse was at the same time very low, she having suffered much at her delivery. I was alarmed at the sight, for I had never beheld a breast of such a prodigious volume. Thinking it necessary from the intenseness of the pain in this case to join an anodine with the ordinary solution, I wrote the following prescription.

R Capit : papaver : contusor : No : XII

Flor : sambuc : manip : ij.

Coque in aq : fontanæ lbiss usque ad lbi : In colato liquore solve

Sal : ammon : cr : ℥iij. deinde adde

Camphor : in spirit : vin : solut : ℥ss. m. f.

* See the description of this case in page 371 of this work.

When this pint of liquid came, I directed it to be mixed with a pint of brandy, and then to be applied warm by cloths dipt into it over all the breast, the arm-pit, and the arm itself, which was much distended. I directed also that the cloths should be attentively wetted again with the warm liquor as often as they became dry. When I called upon her the next day, she told me she had felt much ease in six hours after the application. The swelling was now considerably diminished, the pain almost gone, and the arm restored to its functions. In less than three days the breast was reduced to its natural size, and the complaint entirely dissipated. I advised her to continue the application for a few days, lest she should have a relapse, which, however, she never had.

It is impossible to say what would have been the event of this case had the breast advanced to suppuration; but from the uncommon distension of the part, the excruciating torture that was the consequence of it, and the weak state of the patient, it is probable she would have sunk under a disease, which is not supposed to be attended with any kind of danger.

Thus far we have been speaking of the unsuppurated state of the milk breast; it now remains to consider what is to be done when matter is already formed, in which state it most frequently comes under our inspection. For though the disease be in general slow in its progress, yet the first formation of matter is often made very quickly and suddenly. It has already been observed, that in the ordinary mode of treating these milk breasts with bread and milk poultices, it frequently happens that the suppuration is renewed once a fortnight, once a month, or once in six weeks, for several months together, with great pain and inconvenience to the patient. Now, although the solution of salt ammoniac will not cause the re-absorption of matter when once it is formed, yet it will prevent its forming a second time, when it is once let out. I have tried this in a very great number of cases, and never knew it fail but once; so that the milk breasts treated in this manner do not last more than three weeks, one month, or six weeks at farthest, while the others frequently
continue

continue for several months, and sometimes in the end, leave remains of induration behind them. In the one case where this method failed, the patient was labouring the whole time under a febrile affection, but even in this instance the complaint did not last more than three months. Two sisters, living next door to each other, and lying-in nearly at the same time, were both affected with a coagulation of the milk. These cases both advanced to suppuration. One of these ladies had previously applied to me on account of a scirrhus tumour, the other had no disease in her breast. The former was under my care, and treated with the solution of salt ammoniac; the latter was treated with bread and milk poultices. The first was well within the month, the last remained ill, as I was informed, for four months. These observations appear to establish the advantage of the solution of salt ammoniac above that of the bread and milk cataplasin in these cases. What good, indeed, are we to expect from the latter application in these complaints? It is used as an emollient, to relax the parts and ease the pain. But I fear this relaxation produces more mischief than it does good. The vessels are already too much distended by the influx of milk; the application which really does relax and keep them open, exposes them to a greater influx of milk without appearing to have any effect upon the contents that are already clotted. Besides, is it not probable that as the poultice becomes dry the milk itself may be absorbed from it into the vessels already distended, and thereby add to the coagulation? The solution of salt ammoniac, on the contrary, even if it should not possess the property here ascribed to it of keeping the milk fluid, yet being mixt with spirit, which adds to its own astringency, it is more likely to be advantageous in this case from that very quality. For if the sides of the distended vessels be contracted by the power of any astringent application, they will not only be more disposed to resist the farther accumulation of any fluid, but their diameters being lessened, and their coats squeezed, and compelled to act upon their contents; these contents will be driven back into those vessels where the circulation is still free, and where the constant motion will soon break down and comminute the grumous clots. This is, perhaps, the reason why many inflammations, and particularly of the erysipelatous kind, which

which have long resisted all emollient applications, will soon yield to that of spirit of wine and camphor. This is, perhaps, the reason why the same application, if applied immediately after a scald, will frequently prevent the vesication of the skin, by contracting the vessels and resisting the impulse of the distending fluids; and it is probably for the same reason that spirit of wine and camphor, if timely applied to superficial whitloes, instead of a bread and milk poultice, as is usually practised, will effectually prevent the formation of matter. I shall observe, by the way, that a bread and milk poultice in these cases, seems likely to protract the disease. For when the matter is once formed, though in ever so small a quantity, if it can find a vent through the cuticle, the disease is soon terminated. But at the end of the fingers, where this whitloe is generally formed, the cuticle is naturally very thick, and therefore opposes a strong obstacle to the issue of the matter. The bread and milk poultice, therefore, by keeping the part constantly sodden in moisture must necessarily increase the thickness of the cuticle, and thereby prevent the effect it was intended to forward. This is very evident from the aspect of the skin after having been wrapped up in a bread and milk poultice, for it appears white, compact and corrugated, like the fingers of a washerwoman, who has had her hands all day in the suds. When we come to open it with a lancet we also frequently find it enormously increased in thickness, which circumstance may be partly owing to the inflammation, partly to the constant moisture of the application. This thickening of the cuticle, which prevents the matter from finding its way outwards, makes it spread itself round in every direction, and renders the disease much more extensive and troublesome than it would otherwise be. On the contrary, when it has appeared to me that matter has been already collected in a superficial whitloe, I have often, by puncturing the cuticle, or separating the lamellæ of it with a lancet, given vent to a drop or two of pus; and have thus put a speedy end to a disease, which if this had not been done, might have proved very painful and tedious.

In confirmation of this doctrine, I shall just mention, that a lady, to whose family I am related, being very frequently troubled with super-

ficial whitloes, which were sometimes extremely irksome to her, once asked me if there was no way of preventing these collections of matter. I advised her as soon as she felt pain or throbbing in any of her fingers, so as to make her suspect that the disease was coming on, to dip a piece of rag in camphorated spirit of wine, and apply it with a moderate degree of pressure round the affected part. She followed this advice, and has never had a whitloe in her finger since.

But to return to the milk breast, there is one circumstance more to be considered with regard to this complaint, and that is, whether it be best to suffer the abscess, when formed, to break of itself, or to open it with a lancet. For my own part, experience has determined me in favour of the latter method, and for the following reasons: when abscesses in any part are near the skin, and preparing to burst through it, the distension the inflamed skin suffers at this time is extremely painful, and this natural vent may be obstructed from many causes which we cannot account for. To make a small opening with a lancet, when the skin is thin, seems to me to save the patient four and twenty, if not eight and forty, hours of excruciating pain. Besides, the opening with the lancet, however small, is still larger than that which is made by the spontaneous bursting of the matter. Accordingly, we see that nature sometimes makes way for the matter by five or six different openings; and seems thus to point out to us what is most proper to be done. It appears, therefore, that a small opening with a lancet, besides that it will save the patient some hours pain, will also be more likely to prevent a fresh suppuration by affording a more ample vent to the matter.

THE END.

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E R R O R S.

Page 24, line 5 of the note, for callous, read callus.
— 35, l. 24, for Guillemean, read Guillemeau.
— 41, l. 7, — Bohnices, read Bohnius.
— —, l. 13, — Lambswerde, read Lamzweerde.
— —, l. 16, — Filengius, read Tilingius.
— 42, l. 14, — Meckeren, read Meekren.
— 43, l. 21, — Bellost, read Beilofte.
— 46, l. 2, — Peyrone, read Peyronie.
— 180, l. 18, — Rotron, read Rotrou.

