CRITICAL RETROSPECT
OF
MEDICAL AND PHYSICAL LITERATURE,
[FOREIGN AND DOMESTIC.]

Observations on the Cow-Pox, by William Woodville, M.D.,
Physician to the Small-Pox and Inoculation Hospitals, 8vo. pp. 43. London, W. Phillips.

When the Vaccine Inoculation began to engage the attention of the public, it was immediately perceived by its nature, that two very important pillars of its temple rested on the absence of eruptions, and the impossibility of the contagion being communicated, except by injection of the virus, or inoculation. The inconvenience arising from these sources had always been considered as such formidable objections to the Small-pox, that very expensive establishments had at that time been begun on the continent, with a view to exterminate it altogether.* When Dr. Jenner therefore, found one part of his immortal discovery to appear defective in this respect in the vicinity of the metropolis, and in those patients particularly who were inoculated with matter sent from thence, and scarcely any others, it was impossible for him, in his second publication on the subject, to avoid offering some conjecture on the cause of this diversity. In doing this, he criminated no man; who indeed could criminate such a character as Dr. Woodville? We are therefore much hurt to observe, that Dr. W. should find himself “unable to avoid a certain degree of recrimination, which attaches to a man, for whom he has long entertained a friendly regard, and to whom the public is under the great obligation of having been made acquainted with a discovery, which promises the most important benefits to society.” There is a gentle mildness of temper, in which the cause of truth delights; but which we do not find so conspicuous in the first part of this pamphlet as we expected. With respect to the refutation of Dr. Jenner’s conjecture, the public will judge for themselves when they have read Dr. W’s letter.

The following passage, we apprehend, admits every thing that Dr. Jenner supposed:—“Although I differ in opinion from Dr. Jenner in not imputing the pustular eruptions, produced in the cases at the hospital, to any adulteration of the vaccine matter employed in the inoculations, yet I readily admit that they have been and still continue to be the effect of some adventitious cause, independent of the Cow-pox.

* See Number XVII. p. 90.
This will clearly appear from the following observations, which likewise tend to place the subject in a new light.

I had not long practiced the vaccine inoculation at the hospital, before I was requested to extend it into private families in the metropolis, where I soon discovered that the Cow-pox uniformly appeared in its mildest form, and was never attended with eruptions. I also supplied several medical gentlemen with the vaccine matter, which was used by them with the like result. Hence I began to suspect that there existed some peculiar cause, which rendered the patients under the vaccine inoculation in the hospital more liable to pustules than others: and that this suspicion was well founded I have since, from daily experience, been fully convinced.

At various times I procured the vaccine virus, as produced in different cows, and with it inoculated patients in the hospital; but the effects of all the matter I tried were perfectly similar: and pustules proved to be not less frequently the consequence of these trials than of those made with the matter formerly employed.

The last matter of the vaccine poison which I introduced into the hospital, was obtained from Dr. Jenner, and originally taken from Clark's cow, before noticed: with this matter I inoculated at the hospital on the same day three patients, on one of whom about 100 variolous-like pustules were produced. This instance, and numerous others of the like kind which I could adduce, decidedly prove, that where there can be no doubt entertained of the purity of the Cow-pox matter, with which the patients in the hospital are inoculated, pustules will frequently be the consequence.

On the other hand I have to observe, from daily experience during the last twelve months, that among the great numbers of children residing in various parts of London, to whom I have transferred the Cow-pox infection, no instance of pustules that maturated has occurred. Now, as these different effects of the disease between the patients in, and those out of the hospital did not depend upon any difference or alteration of the matter with which the inoculations were performed, the only cause remaining to which the frequent occurrence of pustules on the former can be rationally referred, is the variolated atmosphere of the hospital, which those patients were necessarily obliged to inspire during the progress of the Cow-pox infection.

Did it not lead me too much into detail, I should flow from many circumstances relating to the patients in the Inoculation Hospital, that other reasons might from thence be adduced to support the opinion here advanced.

Mr. Evans, Surgeon, at Ketley, in Shropshire, is the only person, except myself, who has given an account of the variolous and vaccine inoculations carried on separately in different persons at the same time, and in the same house, so that several of his patients, while under the vaccine infection, were exposed to the variolous effluxia. The number of those which he inoculated for the Cow-pox
Cow-pox amounted to sixty-eight; and it is worthy of remark, that more than one-half of these patients had pustules. It is true that the eruptions very rarely matured; but still their frequent occurrence would seem to show they arose from the same cause as those at the hospital. I suspect also, that in those places where the Small-pox is epidemic, or very generally prevailing, the Cow-pox will be found to be equally liable to excite pustules as in the hospital.

"During the very general and fatal prevalence of the Small-pox at a village eight miles distant from London, more than 100 persons were inoculated under my direction for the Cow-pox, of whom one in five had eruptions; and as these furnish the only instances which I have experienced, out of the hospital, of the Cow-pox producing the variolous-like pustules, I am disposed to attribute them to the adventitious co-operation of the variolous atmosphere to which the patients were exposed. In what way the variolous misfits act in thus modifying the Cow-pox, or why they co-operate in some and not in all cases of vaccine infection, I shall not even venture a conjecture: the caufes probably will continue as inexplicable as those constitutional peculiarities which produce all the varieties of Small-pox."

The practical importance of the following facts, will be a sufficient apology for our inferting them.

"In order to shew that those who had undergone the Cow-pox resisted the infection of the Small-pox, I observed in my Reports, that upwards of 400 of the patients who had received the former disease, were afterwards inoculated for the latter, which in no instance was produced; though more than 100 of the patients had the vaccine disease so very slightly, that it neither produced any perceptible indisposition nor pustules. In addition to this, I can now say, that more than 1000 of those who had undergone the new inoculation, have been put to the same test, and that the like result has been experienced.

"The above facts, added to a multiplicity of others of a similar import, published by several professional men, clearly demonstrate, that the Cow-pox inoculation promises most important benefits to society; and under this conviction I congratulate the public on the great progress it is making, by which the real value of the invention will soon become generally acknowledged, and duly appreciated.

"Those who have had much experience in inoculating with the matter of the vaccine pock, must have observed that it is more apt to fail in communicating the infection than variolous matter, especially if it be suffered to dry upon the lancet before it is used. This does not seem to depend upon the virus of the former being more volatile and more easily carried off by evaporation than that of the latter, but from its becoming more hard and less dissoluble upon exsiccation. Care should therefore be taken to moisten it a considerable time before it is used. When fluid matter is employed, the lancet should be held nearly at a right angle with the skin, in order that the infectious fluid may gravitate to the point of
the instrument, which in this direction should be made to scratch the cuticle repeatedly, until it reach the true skin, and become tinged with blood. This method has many advantages over the common puncture, and I have found it a more convenient and effective mode of performing the inoculation than any other. It may be remarked, however, that there are persons who have never had the Small-pox, and are incapable of receiving it by inoculation, or by any other means whatever. The proportion of these to those liable to the disease has been differently stated by authors; I have not found them to be more than about one in sixty; but as such persons also resist the infection of the Cow-pox, the inoculation of the latter must therefore sometimes fail, independently of the mode in which it is performed, or of the matter employed.”

Reflections on the Cow-pox, illustrated by Cases to prove it an absolute Security against the Small-pox; addressed to the Public, in a Letter to Dr. Jenner, from William Fermor, Esq. 8vo. pp. 47. London. Robson and Robinson.

The first part of this Letter contains general observations on the Small-pox, and the preference due to the Cow-pox, the marks by which the genuine Cow-pox is distinguished, and a statement of the opinions of others respecting its power of permanently preventing the variolous infection.

The author then observes, “That the genuine Cow-pox is a certain preservative against the Small-pox, I flatter myself, the following cases will sufficiently prove. They are selected from many I could bring, of persons who having previously had the Cow-pox, have never been able to receive the infection of the virus from the Small-pox, though inserted a considerable time after, and at different periods. These cases are well known to practitioners and inoculators in this neighbourhood, and I have received most of them from the parties themselves.

“First Case. Jeoffry Tredwell is a reputable farmer, and a tenant of mine, at Chesterton, in this neighbourhood. His brother, William Tredwell, being employed constantly in milking the cows, was infected with the Cow-pox, and had the disease severely in his hands and fingers. Jeoffry not being engaged so much in milking as his brother, did not receive the infection. About three years after, these two brothers were inoculated with variolous matter, by Mr. Lifter, of Charlbury, an eminent practitioner, at a house appropriated for that purpose. William Tredwell, who had undergone the Cow-pox, could not receive the infection, though he was inoculated several times, and remained in the house with the other patients. Jeoffry, who had not been infected with it, had a very full Small-pox eruption.

“Second Case. Alban Collingridge had the Cow-pox about five or six and twenty years ago, at his father’s farm, at Poodle, which affected his fingers in a violent degree. About four years after, he was three times inoculated for the Small-pox, by Mr. Lifter, with-
out effect. Two of his brothers, who had never had the Cow-pox, received the variolous infection. He slept with them in order to take it, but no consequence ensued. He has frequently since been exposed to its contagion, and has very lately inoculated his children with the Small-pox, without being in any shape infected with it himself.

"Third Case. Mr. Stevens, a reputable farmer of East Claydon, in the county of Bucks, had the Cow-pox on his farm, in the year 1764. —He himself was infected with it by milking the cows. About four years after, he was inoculated with variolous matter, but without effect. About the year 1797, his family were inoculated with the rest of the parish for the Small-pox, with which they were all infected, but he was not, though he attended them the whole time. This case must appear decisive with regard to the security the Cow-pox matter affords against the variolous infection, as there was a space of twenty-seven years between his having received the disorder from his cows, and his attending his family in the inoculated Small-pox; and an interval of four years between the time he had the Cow-pox, and his being himself inoculated with the Small-pox without effect."

Many other cases are given, equally conclusive with the above; and a list of 326 persons who were inoculated for the Cow-pox, of whom 173 were afterwards inoculated with Small-pox, without receiving the infection in any instance.

Mr. P. concludes his Letter with the following recapitulation:

"It is unnecessary for me to say any more on this truly interesting subject. I leave the impartial reader to his natural reflections; but I think, in consequence of the above premises, I may venture to say, that he will now be of opinion that the genuine Cow-pox is mild in its effects, congenial with every situation and employment of life, totally void of contagion, and a certain preservative against the baneful influence of the Small-pox. That no constitutional or family complaint can interfere with its effects, or prevent its adoption.

"To conclude; though the public have certainly great obligations to many distinguished modern practitioners, for having, by the cool regimen and present mode of treatment, considerably abated the natural virulence of the Small-pox, to you alone we are certainly indebted for its complete annihilation."

Medical Jurisprudence. On Madness; by John Johnstone, M.D.
8vo. pp. 56. London, 1800. Johnon.
The Author informs us, that this is a part of an extensive work on the subject of medical jurisprudence, and which he should not have published separately, had he not been induced by some recent events. "I have not aimed," says he, "at collecting much of what has been said on the subject of insanity by others. The Anatomy of Melancholy, the works of Batte, Arnold, and Crichton, have exhausted all that can be quoted on the subject, and with Hallam's Practical Inquiry, and the Philosophy of Zoonomia, near-

by the whole that has ever been said. To these writings therefore the inquisitive reader may refer. I have made an effort indeed to compress, not to expand my materials; and such as they are, I now deliver them to the public, with the hope that they will tend to familiarize the scientific doctrines of infancy."

The Author thus sums up his opinions and advice on the subject of Infancy. "Thus then it appears, that melancholy, lunacy, insanity, madness, are the same disease—a disease of the organs of the mind, often called into action by vehement passions, or by injuries of different organs of the body.

"Madness can only be deemed an hereditary disease, inasmuch, as children have a structure similar to that of their parents who have been mad, and as this peculiar organization is likely to be acted upon by the peculiar manners and habits of the parent in education.

"Madness has no lucid intervals; a man is either insane or not insane at a particular moment: unless indeed we be allowed to term every period, in which the hallucination of the maniac does not appear, a lucid interval. But this would be most absurd, for madness is a disease of the brain, and senforial powers, and seldom discovers itself equally at all times. Madness is not always distinguishable from manner—for it assumes the form of the character, whatever that may be.

"The countenance of maniacs is marked by a peculiar wild stare, not to be mistaken by experienced persons, generally mixed with a suspicious or timid, and sometimes with a furious look. Their health is not always visibly affected, though, for the most part, the fibres of maniacs, or their powers of motion, are less irritable or mobile than in good health; hence they are coltive, and difficult to be purged or vomited. Their senorial powers, in some measure, benumbed; hence they feel pain with less acuteness, and are capable of bearing great extremes of heat and cold, hunger and thirst. Their pulse is generally slower than common, when there is no irritation nor disorganization.

When it is determined that a man is mad, he ought to be supposed incapable of acting. He may perchance act wisely, but reason being absent, it is solely from accident if he does so. A maniac cannot commit crimes, and therefore he ought not to be amenable to human law for their commission. He does not discriminate right from wrong.

"All maniacs should be controlled, but all do not require confinement. The necessity of confinement must be determined by the degree of fury, by the temper, and the habits of the maniac.

"Finally, Maniacs should never be entrusted with the management either of themselves, or any other persons, especially the young. There is no faculty more familiar to us than that of imitation; it is the first exercised by the infant, and it grows with his growth. Maniacs therefore should not be suffered to associate with young persons, who will be likely to imitate their actions. For reiterated imitation, by slow yet certain steps, we acquire habits.

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which not only fix the moral character of man, but frequently produce the most pernicious and incorrigible diseases, both of body and mind."

The Edinburgh Practice of Physic and Surgery: preceded by an Abstract of the Theory of Medicine, and the Nosology of Dr. Cullen; and including upwards of Five Hundred authentic Formulas, from the Books of St. Bartholomew's, St. George's, St. Thomas's, Guy's, and other Hospitals in London, and from the Lectures and Writings of the most eminent public Teachers. With four Quarto Plates, neatly engraved, representing the different Instruments used in Surgery. 8vo. pp. 920. price 14s. in boards. London, 1800. Kearley.

This comprehensive Compilation may be considered as a Medical Library for young students; and we think it may, for some time, supersede the necessity of any other. It will serve the purpose of a Text-book during their attendance on Medical and Surgical Lectures, and we may add Midwifery; for the diseases of pregnancy, the puerperal state, and those peculiar to infants, are contained in it. We also find several diseases not treated of by systematic writers in general, but only in distinct works, as Angina Pectoris, Poisons, Suspended Animation, Cow-pox, &c. The work is furnished with Indices to the Practice of Physic, the Surgery, the Materia Medica, and the doses of medicines, as well as of the new and old names. We recommend this book as a valuable addition to the library of the apothecary's shop.

Nosology: or, A Systematic Arrangement of Diseases, by Classes, Orders, Genera, and Species; with the distinguishing Characters of each, and Outlines of the Systems of Sawages, Linnaeus, Vogel, Sagar, and Macbride. Translated from the Latin of W. Cullen, M. D. late Professor of the Practice of Physic in the University of Edinburgh. 8vo. pp. 238. London, 1800. Robinsons.

This Translation appears to us to be executed with great accuracy and fidelity; and is accompanied with the necessary Indices, and a Table of the Greek derivations of the names of the classes, orders, and genera.

A Practical Inquiry into Disordered Respiration; distinguishing the Species of Convulsive Asthma, their Causes, and Indications of Cure. The second Edition, corrected, with an Appendix. By Robert Bree, M. D. 8vo. pp. 300. London, 1800. Robinsons.

The design of this industrious Author is to ascertain the real causes of Asthma, and thence the species and method of treatment. The first edition, he informs us, "was published with some precipitation, and had the faults of diffuseness, and want of perspicuity; but its defects did not prevent the fair view of it in this country, nor on the continent, where it has been translated into two languages."

After a comprehensive view of the opinions of others respecting the ratio symptomatum; and stating his objections to the doctrine of palpmodic
"Asthma is so strongly marked, that there can be little difficulty in knowing the disease; yet it will elucidate the subject, to show its distinction from some other diseases to which it may bear an analogy in its causes and effects.

"Defluxions on the upper part of the lungs and Schneiderian membrane are usually inflammatory affections of the mucous glands which line the passages of the nose, faucies, and trachea, as far as its divisions, and possibly lower in the breast, but not extending to the extremities of the air pipes.

"The catarrhal disposition is very frequently followed by Asthma, because repeated inflammation of the capillary vessels and mucous excretories may induce, in some habits, a loss of tone, which may prevent their resistance to a circulatory impulse even less than healthy, and subject them to the influence of exciting causes of little force in comparison with what they formerly submitted to. For this reason, elderly persons have their natural excretion of mucus much more copious, as they may have been more affected by catarrh, and they are accordingly more liable to Asthma. If inflammatory disposition be not wholly lost in these persons, by the progressive debility of the vessels of the lungs, Peripneumonia Notha will be the character of the pulmonary disease, attended often with great danger.

"I am aware that this species will be designedly confounded by many reasoners with the Humoral Asthma; but it is time that the distinction of Humoral and Convulsive should be better understood. If mucus be discharged in greater quantity in one case than in another, the respiratory actions being the same in both, there is no good reason for calling one only Convulsive. Is not every Humoral Asthma Convulsive? If the unfortunate patient have so little irritability as not to be excited to cough and expectorate, the phlegm must suffocate him, if the absorbing vessels do not carry it off: and this process is attended by Convulsive respiration. But though the Humoral must be Convulsive, the Convulsive Asthma is not always Humoral; for we shall see that irritation may exist in a more subtle form than lymph.

"It is consistent with the rules of the animal economy, that Catarrh should not be indicated by those violent contractions of the muscles of respiration which take place in Convulsive Asthma. Fever attends both Catarrh and Phthisis; and we may observe, though we cannot assign a reason for the fact, that if fever supervenes, it generally terminates convulsive motions.

"If Catarrh occasionally lead to Asthma, it still oftener brings on Phthisis, a disease which depends on a state of the lungs, opposite to that which permits serous effusion.

"In Asthma, an excess of blood in the pulmonary vessels may very probably precede the exhalation of the finer part into the vesiculous and bronchial; this plethora is local, arising from the relaxed texture of the coats of the vessels, and relieves itself by effusion.

"In incipient Phthisis the arterial impulse is more considerable than in health, but the pre-disposition of the pulmonary vessels is not favourable to a relief by effusion, till the fever has acquired strength, and coagulable lymph instead of pelucid serum comes to be effused.

"It is therefore to be allowed, that there is a predisposition, in consequence of which inflammation will affect the arterial extremities, and produce Phthisis, as doubtless there is a pre-disposition leading to that atomic state of the vesicular pulmonary system producing Asthma.

"There may be also an intermediate state, in which a balance is preserved between the crisis of inflammation seeling up the orifices of the arterial exhalents, and their diffusion so gradually acquired as to permit the

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escape of the finer fluid, and consequent relief of arterial fulness; but it is probable that this balance cannot be long adjusted where the pre-disposing causes have had a consid-rable influence, and that if the exhalents do not di-
late soon in consumptive habits, Phthisis must take place; and in persons of an opposite constitution, which I conceive is favourable to Asthma, the effusion of lymph into the vesicles and bronchia will determine, in no long-
time, the future character of the pulmonary disease.

"Lethargic affections have been considerably allied to pulmonary com-
plaints in the consideration of many authors; so much so, as to create a ques-tion if the caule of lethargy did not exist in the lungs.

Hippocrates says, "lethargic diseases are the same as pneumatic, and not altogether different from the humid peripneumony." (Peripneumonia Notha.) Some of his commentators have even defended this opinion by the practical remark, that lethargy is critically relieved by expextoration of pu-
rulent or serous fluid.

"The lethargic symptoms in Asthma and Peripneumony are sufficiently ac-
counted for by the interruption to the course of the blood from the right side of the heart to the left, obstructing the influx of venous blood from the head. The natural consequence in bad cases of Asthma is Apoplexy.

"Asthma being thus occasioned by serum in the vesiculae, may be con-
dered as an Hydropic Disease; but it is obvious distinct from Hydrothorax, in which the water is collected in the sacs of the pleura, or cellular texture of the lungs. In each situation it will occasion dyspncea, which, though subject to exacerbations, from accidental causes, will not put on the form of Periodic Asthma.

"We have sufficient testimony of the connection of Asthma with Dropfy in the histories of practical authors, frequently pointing out the intercurre-
ce of symptoms and changes of one disease into the other, when Asthma has been of long standing: some proof of this is contained in Sect. VI. of this Inquiry.

"Hoffman and Willis have particularly noticed the hydropic appearances of the feet, and the tendency to general Dropfy in Asthma: and the ob-
servation of these authors is supported by that of other practitioners.

"Sydenham opens his treatise of the Dropfy, by stating the first symp-
tom of that disorder, to be the swelling of the legs, and pitting of the an-
cle by preffure of the finger: but this is not to certain a sign in women as in men; nor even in the latter is it to be considered as an absolute certainty of the disease having commenced. He then proceeds with the following obser-vation:

"Etenim cum fenex quaetiam, habitu corporis paulo pleniori praeditis,

"Asthmate jam a multis annis laborans, ab eodem derepente, idque hye-
nis tempore, fuerit liberatus, nolx ingenx tumor mucosus tibiaeum oc-
cupabit, hydropicorum tumores zemulans, qui hymne etiam magis quam
vexitate, tempeliate magis pluvia quam ferena, pariter invalecat, et tamen
fine quavis incommode infligium, eundem ad libitimum uisque comitab-
tur. Quo non obstante, it generaliter loquamur, sìue et tibiae intumel-
centes, etiam in vivis, pro signo supervenientis hydropis habenda sunt;

"maxime si ita affecti spiritum egregius ducant."

"This sagacious observer might have attributed the swelling of the legs, with great truth, to hydropic effusion in the Asthmatic, as well as in other cases; and the cessation of the Asthma when these swellings commenced, seems to corroborate, beyond dispute, the theory, that both affections de-
pended on one caule. The swelling was larger in winter than in summer, in moist weather than in dry. Alterations in the atmosphere rapidly affect the Asthmatic, and change his habit from a perspiring to an imbibing state, and whether the aqueous collection stagnate in the vesicles of the lungs, or be.
be taken up by the absorbents, and be again effused in the lower extremities, the identity of the cause is sufficiently plain.

"Infanity sometimes suspends Consumption, and Consumption Infanity: Asthma, likewise, is succeeded occasionally by Infanity; probably from the turgid state of the vessels of the head in consequence of the difficulty with which the right side of the heart propels the blood through the lungs to the left. In the hydropic diathesis, so frequently accompanying advanced Asthma, the disease of the head is still more frequent.

"The following two cafes deserve attention. In one, the patient had alternately Asthma and Infanity: in the other, there appeared Anasarca and Infanity at the same time. The treatment was successful, though founded on the sole indication of curing the Dropfy.

"We conclude then, that Asthma, Infanity, and Dropfy, had the same cause; for, if Infanity and Asthma were one disease, and Infanity and Dropfy were one disease, Asthma and Dropfy must be one disease.

"From a consideration of the causes of Infanity by the learned Dr. Arnold, there can be no difficulty in ascertaining the connection between these diseases."

The Author next proceeds to the investigation of the predisposing and exciting causes, and the establishing of his four species. He then lays down a plan of treatment for the paroxysm of each species, with general rules for the diet of the patients, both during the paroxysms and the intermissions.

The Appendix contains a recapitulation or synopsis of the work, with additional facts and observations in confirmation of his distinctions, and plan of treatment.

Though the stile of this work appears to us defective, we have no hesitation in recommending the matter of it to practitioners, as well worthy of their attention.

Researches, Chemical and Philosophical: chiefly concerning Nitrous Oxyde, or Dephlogiificated Nitrous Air, and its Respiration. By Humphry Davy, Superintendent of the Medical Pneumatic Institution. 8vo. pp. 590. London, 1800. Johnson.

The first of these Researches chiefly relates to the production of nitrous oxyde, and the analysis of nitrous gas and nitrous acid. "In this," says the Author, "there is little that can be properly called mine; and if by repeating the experiments of other chemists, I have sometimes been able to make more minute observations concerning phænomena, and to draw different conclusions, it is wholly owing to the use I have made of the instruments of investigation discovered by the illustrious fathers of chemical philosophy, Cavendish, Priestley, Black, Lavoisier, Scheele, Kirwan, Guyton, Berthollet, &c. and so successfully applied by them to the discovery of truth.

"In the second Research, the combinations and composition of nitrous oxyde are investigated, and an account given of its decomposition by most of the combustible bodies.

The third Research contains observations on the action of nitrous oxyde upon animals, and an investigation of the changes effected in it by respiration.

In the fourth Research the history of the respirability and extraordinary
ordinary effects of nitrous oxyde is given, with details of experiments on its powers made by different individuals."

Our recommendation will not be necessary to induce every lover of chemistry and physiology to peruse this truly philosophical work; our readers will judge of its importance by the following extracts.

Mr. D. concludes his first Research with the following general remarks on the production of nitrous oxyde. "There are no reasons for supposing that nitrous oxyde is formed in any of the processes of Nature; and the nice equilibrium of affinity by which it is constituted, forbids us to hope for the power of composing it from its simple principles. We must be content to produce it, either directly or indirectly, from the decomposition of nitric acid. And as in the decomposition of nitrate of ammoniac, not only all the nitrogen of the nitric acid enters into the composition of the nitrous oxyde produced, but likewise that of the ammoniac, this process is by far the cheapest, as well as the most expeditious. A mode of producing ammoniac at little expence, has been proposed by Mr. Watt. Condensed in the sulphuric acid, it can be easily made to combine with nitric acid, from the decomposition of nitre by double affinity. And thus, if the hopes which the experiments at the end of those researches induce us to indulge, do not prove fallacious, a substance which has been heretofore almost exclusively appropriated to the destruction of mankind, may become, in the hands of philosophy, a means of producing health and pleasurable sensation."

Respecting the decomposition of nitrous oxyde and its analysis, he draws thes general conclusions. "From what has been said in the preceding sections, it appears that the inflammable bodies, in general, require for their combustion in nitrous oxyde, much higher temperatures than those at which they burn in atmospheric air, or oxygene.

"When intenfely heated they decompose it, with the production of much heat and light, and become oxygenated.

"During the combustion of solid or fluid bodies, producing flame, in nitrous oxyde, nitrous acid is generated, most probably from a new arrangement of principles, analogous to those observed in Sect. II. by the ignition of that part of the gas not in contact with the burning substance. Likewise when nitrous oxyde in excess is decomposed by inflammable gas, nitrous acid, and sometimes a gas analogous to common air, is produced, doubtles from the same cause.

"Pyrophorus is the only body that inflames in nitrous oxyde, below the temperature of ignition.

"Phosphorus burns in it with the blue flame, probably forming with its oxygene only phosphorous acid at the dull red heat, and with the intenfely vivid flame, producing phosphoric acid at the white heat.

"Hydrogene, charcoal, sulphur, iron, and the compound inflammable bodies, decompose it only at heats equal to, or above, that of ignition: probably, each a different temperature."

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From the phenomena in Sect. V. it appears, that at the temperature of intense ignition, phosphorus has a stronger affinity for the oxygen of nitrous oxyde than hydrogen; and reasoning from the different degrees of combustibility of the inflammable bodies, in mixtures of nitrous oxyde and nitrogen, and from other phenomena, we may conclude with probability, that at about the white heat, the affinity of the combustible bodies for oxygen takes place in the following order: Phosphorus, hydrogen, charcoal, iron, sulphur, &c.

This order of attraction is very different from that obtaining at the red heat; in which temperature charcoal and iron have a much stronger affinity for oxygen than either phosphorus or hydrogen.

The smallest quantity of oxygen given in the different analyses of nitrous oxyde just detailed, is thirty-five hundred parts; the greatest proportion is thirty-nine.

Taking the mean estimations from the most accurate experiments, we may conclude that 100 grains of the known ponderable matter of nitrous oxyde, consist of about 36.7 oxygen, and 63.3 nitrogen; or, taking away decimals, of 37 oxygen to 63 nitrogen; which is identical with the estimation given in Research I.

Analysis and synthesis clearly prove that oxygen and nitrogen constitute the known ponderable matter of atmospheric air, nitrous oxyde, nitrous gas, and nitric acid.

That the oxygen and nitrogen of atmospheric air exist in chemical union, appears almost demonstrable from the following evidences.

1st. The equable diffusion of oxygen and nitrogen through every part of the atmosphere, which can hardly be supposed to depend on any other cause than an affinity between these principles.

2dly. The difference between the specific gravity of atmospheric air, and a mixture of 27 parts oxygen and 73 nitrogen, as found by calculation; a difference apparently owing to expansion in consequence of combination.

3dly. The conversion of nitrous oxyde into nitrous acid, and a gas analogous to common air, by ignition.

4thly. The solubility of atmospheric air un-decomposed in water.

Atmospheric Air, then, may be considered as the least intimate of the combinations of nitrogen and oxygen.

It is an elastic fluid, permanent at all known temperatures, consisting of .73 nitrogen, and .27 oxygen. It is decomposable at certain temperatures, by most of the bodies possessing affinity for oxygen. It is soluble in about thirty times its bulk of water, and as far as we are acquainted with its affinities, incapable of combining with most of the simple and compound substances. 100 cubic inches of it weigh about 31 grains at 55° temperature, and 30 atmospheric pressure.

Nitrous Oxyde is a gas unalterable in its constitution, at temperatures below ignition. It is composed of oxygen and nitrogen,
trogene, existing perhaps in the most intimate union which those substances are capable of assuming. Its properties approach to those of acids. It is decomposable by the combustible bodies at very high temperatures, is soluble in double its volume of water, and in half its bulk of most of the inflammable fluids. It is combinable with the alkalies, and capable of forming with them peculiar salts. 100 grains of it are composed of about 63 nitrogene, and 37 oxygene. 100 cubic inches of it weigh 50 grains, at 55° temperature, and 30 atmospheric pressure.

"Nitrous Gas is composed of about 56 oxygene, and 44 nitrogene, in intimate union. It is soluble in twelve times its bulk of water, and is combinable with the acids, and certain metallic solutions; it is possessed of no acid properties, and is decomposable by most of the bodies that attract oxygene strongly, at high temperatures. 100 cubic inches of it weigh about 34 grains, at the mean temperature and pressure."

"Nitric Acid is a substance permanently aeriform at common temperatures, composed of about 1 nitrogene, to 2,3 oxygene. It is soluble to a great extent in water, and combinable with the alkalies, and nitrous gas. It is decomposable by most of the combustible bodies, at certain temperatures. 100 cubic inches of it weigh, at the mean temperature and pressure, nearly 76 grains."

The third Research contains a great number of experiments on the changes produced in them, by the respiration of nitrous oxyde, and other gasses; and concludes thus:

"The experiments in the first Division of this Research, prove that nitrous oxydes when respired by animals, produce, peculiar changes in their blood and in their organs, first connected with increased living action; but terminating in death.

"From the experiments in this Division, it appears, that nitrous oxyde is rapidly absorbed by the circulating venous blood, and of course its condensed oxygene and nitrogene distributed in the blood over the whole of the system.

"Concerning the changes effected in the principles of the impregnated blood during circulation and its action upon the nervous and muscular fibre; it is useless to reason in the present state of our knowledge.

"It would be easy to form theories referring the action of blood impregnated with nitrous oxyde, to its power of supplying the nervous and muscular fibre with such proportions of condensed nitrogene, oxygene and light, or etherial fluid, as enabled them more rapidly to pass through those changes which constitute their life: but such theories would be only collections of terms derived from known phænomena, and applied by loose analogies of language to unknown things."

"We are unacquainted with the composition of dead-organised matter; and new instruments of experiment and new modes of research must be found, before we can ascertain even our capabilities of discovering the laws of life."
The last Research, which is by far the most important to the practitioner, details the effects produced on the human frame, by the respiration of nitrous oxyde and other gases. For these we must, at present, refer to the Work itself.

The Doctrine of Phlogiston established, and that of the Composition of Water refuted: by Joseph Priestley, LL.D. F.R.S. &c. &c. 8vo. pp. 90, 1800. London, Johnson.

It is inconsistent with our plan to enter into theoretical discussions which are not immediately connected with the healing art. Whether the truth lie on the side of Dr. P. or his opponents, we cannot determine; but we believe that the tide runs so forcibly at present in favour of the Antiphlogistic doctrines, that chemists had rather be carried away by it, than be at the trouble of stemming the current, even for the sake of arriving at the harbour of truth.

Dr. P. examines the calcination and reduction of metals, the composition of water, the constitution of fixed air, and azote, from all which he draws inferences in favour of the existence of Phlogiston.

A Practical Treatise on the Efficacy of Stizolobium, or Cowbage, (the Dolichos Pruriens of Linnaeus) internally administered, in Diseases occasioned by Worms. To which are added, Observations on other Anthelmintics of the West Indies. By William Chamberlaine, Surgeon, Fellow of the Medical Society of London, 8vo. pp. 90. London, Printed for the Author, No. 29, Aylebury Street, Clerkenwell.

We think this practical work well worthy the attention of practitioners: It contains a sufficient number of cases to prove the efficacy of the remedy, as well as the safety with which it may be administered.

Critical Survey of the latest Theories on difficult Dentition in Children.

[Continued from pp. 171-177 of our last.]

Notwithstanding these authorities, it will appear by the following observations, how little it deserves to be depended upon, and how far it is from being capable of removing those affections, which befal the infantile age in the period of teething.

1. It seems very improbable, and almost ridiculous to imagine, that, by this simple operation, the growth of the teeth should be promoted in a few days, to which otherwise several months are required.

2. It has been stated, that convulsions have actually ceased after performing that operation; but could not its effect be thus explained, that they were removed by its having caused an irritation in another part of the body, and acted in a similar manner as we observe blisters, scarifications, and artificial ulcers, applied for the same purpose?

Num. XIX, 3. As
3. As it is frequently the case, that more teeth than one are preparing to penetrate, it is difficult to determine which protuberance is to be cut through.

4. The success of the operation depends in a great measure on the critical time when it should be undertaken, which is often impossible to determine. Van Swieten advises, therefore, not to perform it for fear of losing credit, as he relates a case where the tooth did not appear till two months after the operation.

5. By the experience of eminent physicians and surgeons, it has been found not only of no avail, but rather hurtful in some cases. Platner (Institutiones Chirurg. § 1078) advises not to undertake the operation, for fear of hurting the teeth. Schaeffer observes, in his translation of Armstron, that only in a few cases it seemed to have effect, but in two others it proved unfortunate. Deffault and Gavand, (Traité d'Anatomie) confess, that it has been performed without success. Dr. Selle and Dr. Tade, two physicians of known merit, caution every body against it, because they think that the wound, by healing and causing a scar, will render the piercing of the teeth more difficult. Dr. Starke, Professor and an eminent practitioner at Jena, and Doctor Hecker, are likewise opposers of the operation.

The application of leeches behind the ear is another remedy, whose infallibility in difficult dentition was highly praised by Le Roy, (in Esprit des Journaux, 1784, where he says of it, "C'est donc un grand moyen de population, qu'une sangue derniere l'oreille des enfans") though it was recommended before him by Harris, (de morbis infantium); but it has been now much left off, and only kept its reputation against difficult dentition when another disease was mistaken for it and accidentally cured. The same may be said of other general remedies, which are likewise efficacious in other diseases, but which possess no particular power against difficult dentition, as blisters, &c.

Having given the arguments against difficult dentition, it may be proper to add some general reflections on the subject.

1. If any danger could be supposed to arise to children from the growth of bones, and if Nature did not prevent any morbid affections, or surmount any difficulties by proceeding always gradually in the formation of the body, dangerous symptoms might be much sooner expected from the growth of the skull, particularly when the futures are forming, because the dura mater and the pericranium are more sensible than the soft spongy gingivae; and even the growth of the nails might more easily be supposed the cause of those symptoms, on account of the great sensibility of the neighbouring parts: but nobody ever considers them as causes of morbid infantile affections.

2. There is nothing analogous in the economy of the human body, or which has any similarity with difficult dentition, wherein by a gradual and natural growth disease is produced. The growth of other bones would as certainly excite pains and dangerous symptoms, if it was sudden or very quick; which being anomalous,
lous, is never supposed to be the case; and pains are not even perceived in some diseases of the bones, in curvatures of the back-bone, or when teeth grow in a preternatural direction.

3. If the growth of teeth were able to cause such very dangerous symptoms, it may be supposed, that trismus would be particularly brought on, as it is so common to children; but this is only observed in the first days of life.

4. Pains arising from double teeth cutting through in adults, are not to be compared with dentition in children, because this is preternatural and anomalous. It is with more difficulty such a tooth can get through, because the place which it is to occupy, is more contracted, and partly filled with the neighbouring teeth, and besides this, the gums are not so soft and yielding as they are in a child.

5. There is no analogy between the pains supposed to be occasioned by difficult dentition and those arising from a caries dentium, because a true inflammation spreading to the neighbouring parts takes place here, which originates from the nerve of the teeth being affected. Carious teeth never produce such general symptoms, even in children, as are derived from difficult dentition; every affection remains local here, and only a little fever, or a want of appetite comes on, as is the case in every pain. Now is it probable, that a difference of a few years would lessen the irritability so much, that, for instance, a child of six years should not be attacked with convulsions from a visible and painful affection of a tooth? whereas, it is supposed to suffer them at the age of one or two years from an invisible and suppositious cause.

Dr. Wichmann concludes his paper by observing, that even if he had not succeeded in proving the non-existence of difficult dentition, he should think himself satisfied if he could but convince practitioners not to attribute too much to dentition; that this was not assigned as the only cause for all diseases of children, observable at the time of dentition; and that it may not be neglected to point out and search other causes, before they are derived from dentition.

Such is the opinion of Dr. Wichmann; on which we shall subjoin, (in our following Number) a few Observations, stating how far it is to be restrained or admitted.

Bemerkungen; i. e. Remarks on the Brunonian Practice; by D. CHRIST. WILLIAM HUELAND, Professor of Medicine at Jena, Vol. I. 1799, pp. 127, 8vo. Tubingen, Lotta.

The name of Professor Hufeland has acquired so much celebrity, even in this country, as naturally to excite the curiosity of every medical man, to know the opinion of this great practitioner, on a system of medicine which has of late gained so much ground among physicians, and has been particularly received with applause on the continent. Mr. Hufeland had already communicated his judgment on it, in several numbers of his Practical Journal; but we find his ideas all united here, though, except in a few instances
instances, unaltered. In the Introduction, he confesses himself to be, on the whole, an antagonist of this new system, in which but few ideas meet with his approbation, that, however, have been already received before Brown, by every reasonable practitioner. But, the chief object of this publication is, to caution young practitioners against indiscriminately applying in practice the raw principles of Brown's theory, seduced by its apparent simplicity and consistency. The manner, he proceeds, in which some enthusiasts attempted to introduce the Brunonian practice, by which they aimed at nothing less than a revolution in medicine; the spirit of faction which is thereby excited, is by no means calculated to forward science. It lies indeed, in the nature of things, that the erroneous principles and doctrines of Brown's theory will be supplanted in time; but they may leave a dangerous tendency to faction and discord, which is very prejudicial to truth and knowledge, and apt to lead to partiality, which checks the mind in inquiry. This system proceeds but from one point of view, that of incitability, and deems all auxiliary knowledge, anatomy, chemistry, &c. superfluous. The Introduction concludes, that the Brunonian system is full of inaccuracies and sophistry, and has too many charisms to deserve the name of a system: Pure Brunonianism will produce daring physicians, not understanding how to manage Nature, but continually tyrannizing over her. Against these introductory premises, may be replied by the well-wisher of that system, that, if its principles are allowed to be theoretically consistent and just, their not proving so in practice is to be derived from their being misapplied, and misapplied, which, consequentlv, cannot be considered as a fault of the system, but rather as a fault against it. Its imperfection can be no objection; this it shares with all systems, by which Nature is regulated. However, it excels all other, by fixing only one point of view, and avoiding a perplexing multiplicity; farther, it may be suggested, that ill consequences suppos'd to originate from the Brunonian method of treatment, are partly exaggerated, partly groundless, if this is built not upon the mere literal sense, but upon its true genius, a circumstance which deserves to be well weighed and distinguished. Incitability is by no means the only point of view in this system; and the extensive class of topical diseases, leaves great room for mechanic action and chemistry. - The study of the auxiliary branches of medicine, is not at all rendered superfluous by it, as the celebrated Frank, of Vienna, has sufficiently demonstrated. How far this general apology for the Brunonian system is able to remove the above imputations, we must leave undecided, as this would necessarily lead us farther into the subject than the limits of this Journal will admit. It may suffice to remark, that many antagonists of that system, who attempted to show its errors and insufficiency, have sometimes hurt their own cause, by not having sufficiently studied and entered its genius. Whether this is the case here, we leave out readers to judge, by representing to them briefly, the contents of this publication, to which the bounds of the
the Medical journal will only allow us to add, now and then, some remarks, which can be brought forward on the side of the Brunonian theory. The contents accordingly, are delivered under eleven different heads: 1. Practical point of view. In the examination of a system, it is not of so much consequence, whether it possesses a logical consistency, but whether it alleviates and improves the cures of diseases; and many systems have been forsaken, on account of this disharmony with the practice. 2. Diagnosis of diseases is but seemingly rendered easier by Brown's theory; for the symptoms of a phthisic state often occur in asthenic diseases, and vice versa. Brown commits, besides, the fault of considering the names of diseases sufficient to distinguish whether they are phthisic or asthenic. Moreover, the distinction of direct and indirect debility, is subject to many difficulties, and often quite impossible; for instance, in speechless persons; and sometimes such causes have preceded, that may produce as well one state as the other, which must of course perplex the Brunonian physician, or oblige him at least to state a mixed debility, in which exists at the same time, want and superabundance, a state quite contradictory in itself, which requires alike the most powerful and the weakest stimulus. Finally, it is very often impossible to find and determine the degree of incitation, and the proper remedy for it. Every thing depends on a cautious experiment; and the pretended mathematical certainty of the Brunonian theory is but a phantom. To this will be probably objected, that phthisic and asthenic symptoms are not only attended to in this system, but that, also, a chief point of it consists in determining whether a disease is topical or general; and as the present phenomena of a phthisic and asthenic state are often uncertain and fallible, it is particularly urged by this system, to look back to the preceding influences and morbid disposition for determining the diagnosis. 3. The two species of death. Prof. H. thinks it inconsistent with experience, that according to this system, there are but two paths to death, by direct and indirect debility: there exists a third, in the unfitness or destruction of vital organs, where neither the asthenic nor phthisic method is of any avail. However, the Brunonian will refer here to the above proximate cause, either by considering the loss of such an organ as the want of a stimulus necessary for life, or as a state primarily originating from direct or indirect debility, &c. 4. Action of medicines. It is a chief principle of the Brunonian theory, that the action of remedies depends solely on gradation, or the degree. However, its followers often combine indiscriminately, remedies of different degrees, viz. bark and senega. Now, if the degree of incitement requires bark, it ought to be given alone; for senega being a weaker stimulus, cannot add to its power, nor diminish it, as it is itself an exciting remedy: the use of such a combination is, however, proved by experience. In this manner, the Brunonian is obliged to act, inconsistent with his system, and silently to allow cases, where a specific difference of the stimuli and their chemical action take place. As instances of a mere mechanic and chemical action, the use of oil in inflammations, of alkali in gout,
of citric acid in scurvy, is adduced. But the gradual difference of remedies in their action, must be only understood as far as they act upon incitability in general, but not on the individual state of a single organ, where different laws take place. With respect to the combination of different remedies, it may be said, that this apparent inconsistency depends on our imperfect knowledge of the relative and absolute powers of medicines, and of the present state of incitation; and accordingly, in cases where even a cautious experiment is not allowed, recourse must be had to a combination of remedies, which experience has found to produce the necessary degree of incitation. The mechanic use of oil in inflammations is by no means denied by Brown’s theory, and alkalis might be supposed not to act as stimuli, if they cured nothing but the gout, and if this was only cured by them. The use of citric acid, though seemingly a weakening medicine, may, in a high degree of scurvy, be in the same way explained, as the use of ice in frozen animals. 5. Unequal distribution and action of vital power. Under this title, Mr. H. enters into an enquiry of the asthenic and sthenic method, as a basis of the Brunonian theory; and attempts to shew, how repugnant this is to reason and experience. The different parts of the body possess different degrees, and specific different modifications for irritaments; as thefe act either only upon one part, or in different degrees upon all, and produce consequentfly, in one, a sthenic, in another an asthenic state. This seems to be confirmed by experience in nervous fevers and pulmonary consumptions; where, in the first case, active inflammations sometimes occur, requiring moderate bleeding and antiphlogistics, when the general treatment consists in keeping up the nervous power by valerian, camphor, &c; in the latter, small veinfections often contribute to prolong the life of the patient. It may suffice to figger here, that according to Brown, both states are not entirely denied to co-exist in different parts of the same organisms, and that there is no specific irritament, which does not prove for the whole constitution either asthenic or sthenic. The instances besides adduced by Mr. H. are doubtful, and not even admitted by some Non-Brunonians.

6. Action of cold and warmth. Prof. H. discourses, in a dialogue between himself and a friend of the Brunonian system, the question; whether cold has a weakening, and warmth a strengthening effect upon the body. He proposes several arguments to prove, that this expression is very relative and unsettled; that warm baths are known to render the pulse flow; that inflammatory disfeases occur oftener in winter than in summer; in short, that strengthening and weakening are ideas too relative, to be able to ascertain whether any thing is weakening or strengthening; that cold has, besides, an afftringent quality, &c; in short, the contrary of this Brunonian principle may with the fame reason be ascertained. How far these and similar arguments may appear satisfactory to a Brunonian, is easily conceived.

7. Application of cold and warmth. Prof. H. relates here, the cases and circumstances at large, in which both may be used as stimuli, as strengthening and weakening remedies, according
according to what we find recorded by experience. Some of these seem indeed contradictory to Brunonian principles, or would at least, with difficulty be explained after them: however, a Brunonian will not be at a loss to extricate himself. 8. Hemorrhagies. There are not only passive or athenic, but likewise active or thetic hemorrhagies, originating from an increased action or local irritation, either idiopathic or confluent, which require weakening remedies, antispasmodics, &c. 9. Direct and indirect debility. The notion of two forms of debility from increased or diminished irritability, was entertained long before Brown received and influenced the practice; but it is erroneous to derive them, with him, from the different action of irritaments. In support of this, Prof. H. brings forth several arguments; viz. that the same causes produce quite contrary species of debility; that often the vicissitude of both species of debility occurs in the same individual, without the least change in the external influences; in short, that Brown's distinction of direct and indirect debility has no practical use. 10. Topical and general diseases. The division of diseases into topical and general, already adopted by Galen, is by no means calculated to improve the practice, because no certain mode of treatment can be built upon it, as there are topical diseases, the causes of which lie in the general constitution; viz. scorbutic ulcers, &c. as general diseases are often cured by topical remedies, blisters, purgatives, &c. The division into idiopathic and confluent diseases, seems therefore, by far preferable. By this it appears, that Prof. Hufeland has not quite entered into the notion which Brown has of topical diseases, which is different from what has been stated here by him. 11. Necessary retrospective to the state of the organic as well as morbid matter. This circumstance seems to be utterly neglected by Brown, by only adopting the notion of incitation and incitement. However, many diseases do not depend on the degree of incitation, but on the chemical difference of organic matter, because, it would be otherwise inconceivable, why debility could produce scurvy as well as gout; why alkali is hurtful in the latter, and useful in the former. Remedies do not therefore merely act as irritaments, but they cause also a change in matter. The whole is concluded with some cases, as additional arguments against the fashionable practice: Such are the objections of Prof. Hufeland. The plan of this Journal will excuse us for not having reviewed them more at large; and we only beg leave to add, that though the above arguments show the ingenuity of their author, yet they will not be deemed sufficient by the Brunonian, to subvert the system against which they are intended.

Apologie, &c. i.e. Apology for the Brunonian System of Medicine, grounded upon Reason and Experience. Edited by D. CHARLES WERNER, Physician in Austria, Vol. I. pp. 314, 8vo. Vienna, Wappler and Beck.

The tendency of this publication is intimated upon the title, and the author informs us in the Introduction, that it is intended to defend Brown's doctrine, and confirm it by facts; a doctrine which
Mr. Scarpa, on the Structure of the Bones.

This celebrated anatomist, whose great merits and discoveries in the finest parts of anatomical researches are generally acknowledged, has again given a proof of his great abilities and inquisitive genius, by a publication that appeared last year at Leipzig, entitled De Pernitori Offium Structura Commentarius, 55 pages in 4to. splendidly printed, with three plates elegantly engraved. The common opinion hitherto prevailing amongst anatomists was, that bones consisted of fibres, plates, or laminae, lying in different strata one upon another; but this only appears so in the bones of children, which, though improperly, may be said to be formed of fibres and plates; for, on examining them through a microscope, they are observed to be reticular and ramifying amongst themselves; it may therefore generally be asserted, that all bones are of a reticular and cellulosal texture. To know whether the most solid, compact, and, as it were, stony part of a bone were cellulosal, Mr. Scarpa proceeded both in an analytic and synthetic way. In repeating Haller's experiments on the incubation of eggs, he discovered by the help of a microscope, in the thigh and shin bones, the finest reticular texture, which first appeared wrinkled, but on the 14th day it represented itself quite reticular, cellulosal, and twisted like cotton. This he observed likewise in the bones of an embryo of 28 lines in length. For the analytic inquiry, he put a human bone into diluted muriatic acid. The earth being dissolved, and the acid washed out, it was macerated in water, and became a woolly reticular texture. The mefhes and interstices of it are larger in flat and broad bones than in the round ones, closer where the bones are compact, and looser where they are less solid. The finest structure has accordingly a great likeness to that of the skin. The cellular structure of the bones is particularly observable in whales, dolphins, sharks, and other fishes. The following experiments seem likewise to contradict the common opinion of the laminous
laminous structure of the bones: He destroyed the thin bone of a
dog, and forty days after the external rind of it was changed
into a spongy substance of the thickness of 6 lines, which is the
same case in mortification of bones, where nature surrounds the
dead end of it with a thick bony sponge, only by expanding and
widening the outer crust of the bone. A similar circumstance
happens in the mollities ossium in children, where the bones receive
the same spongy appearance as if they were laid in muriatic acid.
A topical morbid mollification is sometimes observed in bones, by
which they are changed into a fleshly mass, very vascular and easily
bleeding, which evidently shews an analogy with common tela
cellulosa, forming a similar flesh in ulcers. It is very striking how
soon the bones of birds produce a spongy cotton-like texture when
deprived of the periosteum; "visu mirabile est, in avibus quanta
celeritate ex ossibus de industria perioites nudatis, mollis carunc-
cula propullulat; sanguiferis vasis plurimum referta, quae porro in
cartilagineum primum, mox intennissimum quoddam ossum gossy-
pium subtiliter cum extus tum intus reticulatum convertit." The bones possefs a greater quantity of vessels than is generally
believed, but those that penetrate into them by the pori Haversii do
not proceed in a straight direction, but form nets in the internal
substance; they are likewise provided with nerves, though these
cannot be anatomically demonstrated on account of their subtlety
and close situation to the vessels; but it is shewn, by experience,
that the young flesh shooting out of wounds of the bones is possefsed
of great sensibility. The external plate of the flat bones of the
skull appears like diploe, when its internal lamina is already quite
solid. The formation of cavities in bones seems to proceed in a
mechanical way, by the hardening of the rind.