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MEDICAL ESSAYS.



ESSAY FIRST.

ON THE EFFECTS OF INTESTINAL IRRITATION.

ESSAY SECOND.

ON SOME EFFECTS OF LOSS OF BLOOD.

ESSAY THIRD.

ON EXHAUSTION AND SINKING FROM VARIOUS CAUSES.

BY

MARSHALL HALL, M.D. F.R.S.E.;

PHYSICIAN TO THE GENERAL HOSPITAL

NEAR NOTTINGHAM;

&c. &c.

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1825.



MEDICAL ESSAYS.

JOHN STURGEON M.D. F.R.S.

ESSAY FIRST.

ON THE EFFECTS OF INFLAMMATORY IRRITATION.

IN WHICH THE AUTHOR HAS MADE USE OF

ESSAY SECOND.

ON SOME EFFECTS OF LOSS OF BLOOD.

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ESSAY THIRD.

ON EXHAUSTION AND NERVOUSNESS FROM VARIOUS CAUSES.

BY

MARSHALL HALL, M.D. F.R.S.E.

PHYSICIAN TO THE GENERAL HOSPITAL

NEAR NOTTINGHAM ST. LONDON.

MDCCCXXII.

LONDON

PRINTED BY

ROBERT CLAY, BARRINGTON ST. AND BRIDGE ST.

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1822

TO
JOHN STORER, M.D. F.R.S.

&c. &c.

TO WHOM THE PROFESSION CHIEFLY OWES ITS

RESPECTABILITY

IN THIS NEIGHBOURHOOD,

THE

FOLLOWING PAGES

ARE RESPECTFULLY INSCRIBED,

BY

THE AUTHOR.

Nottingham, November 12th, 1825.

TO
PREFACE
JOHN STORER, M.D. F.R.S.

60 60

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RESPECTABILITY

THE following sketches will be found
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PREFACE.

THE following Sketches will be found, I think, to contain many observations of great novelty and importance in the practice of Physic.

The effects of intestinal irritation, of exhaustion from loss of blood, and of exhaustion and sinking from other causes, appear to me to have escaped the observation of medical writers almost altogether.

That the first and second of these states should induce symptoms resembling those of inflammation of the brain, and that the state of exhaustion and especially of sinking is apt to be attended by symptoms resembling those of compression of that organ, are facts which must greatly influ-

ence our prescriptions in many cases of great emergency.

Similar remarks will also apply to the influence of intestinal irritation in inducing symptoms of inflammation of the peritonæum or intestines, of which I observe an interesting example in the recent work of M. Andral.* This state of the bowels sometimes also, though more rarely, occasions pain of the side and other symptoms of inflammation of the pleura, and occasionally induces the apprehension of affection of the heart.

Loss of blood, in certain circumstances, is attended by all the symptoms of violently increased action of the general system, and especially in the head and of the heart; and I have no doubt that recourse has frequently been had to the lancet, when an acquaintance with the facts contained in the second of these essays, would have dictated far different measures. I may here take the opportunity of observing that many of the sym-

* Clinique Medical, Tome I, p. 52.

ptoms which result from loss of blood in adults, are observed to occur in children in some cases of diarrhœa,—especially the symptoms of great nervousness and affection of the brain. Of this I have very recently witnessed a marked example.

It is plain from these observations that there are cases which require to be very cautiously distinguished from inflammation, and which have by no means hitherto received the attention which they imperatively demand. I now beg to remark that these cases are extremely apt to occur in the puerperal state, from the prevalence of their causes—intestinal irritation and loss of blood—at that period. The following essays are, indeed, only preliminary to the publication of a treatise on Puerperal Diseases, in which it is my wish to contrast anew and with great accuracy, the history, symptoms, morbid anatomy and treatment of those diseases.

The second of these essays naturally led me on to the investigation of the subjects of the third. They are all presented to the medical reader, as mere sketches

requiring to be filled up; and they are published in this imperfect state, in the hope that I may by this means be assisted by the observations and communications of others, which I thus beg leave earnestly to solicit. There is one subject slightly noticed in this last essay, of peculiar interest,—protracted lactation; the effects of this insidious cause of disorder upon the general system, upon the brain, lungs, heart, intestines, &c. still require to be accurately traced. The exhaustion induced by it, not unfrequently issues in paralysis, in a species of consumption, in a deranged state of the chylopoetic organs, and in dropsy. The subject is altogether one of great interest and deserves a renewed and careful investigation.

Of the other topics included in the third of these essays, I may truly say that they present a vast and interesting field for inquiry. The state of sinking requires to be distinguished from mere debility. Whilst debility consists in a greater or less deprivation of the wonted strength, sinking appears to be more positive and active in

its nature and in its tendency to destroy life. Sinking differs also according to its causes. In cases of sinking from exhaustion, there appears to be a failure of the powers of the whole nervous system, and this is manifested by its effects on the functions of the brain, heart, lungs and intestinal canal; the bronchia and probably the air-cells become clogged with mucus, and perhaps the cellular substance of the lungs, with serum; this case affords indeed, a new example of a morbid affection in which the Stethoscope may be of service in early detecting its nature. When the state of sinking occurs from affection of the brain, there is a gradual failure of the actions of the heart and of respiration; when, on the contrary, it arises from a clogged state of the bronchia or of the lungs, there is conjoined with it a manifestly defective arterialization of the blood; and, lastly, when sinking takes place in certain affections of the stomach and bowels, as enteritis, dysentery, &c. there is great failure of the action of the heart indicated by an extremely small

pulse, and of the animal heat. These differences in the state of sinking require to be still further traced, and it is highly probable that the inquiry would lead to many interesting observations both in physiology and pathology.

I once more beg to repeat that the following pages are offered to the medical reader, only as containing materials for thinking and suggestions for renewed inquiry. In every other sense I am fully aware of their many imperfections.

ESSAY FIRST.

ON

THE EFFECTS

OF

INTESTINAL IRRITATION.

The first part of the paper is devoted to a description of the cases of intestinal irritation which have been observed in the practice of the author. It is shown that the disease is not uncommon, and that it is often associated with other affections of the digestive system. The symptoms are generally those of a local inflammation, and the treatment is accordingly directed to the relief of the local affection.

In the second part of the paper, the author discusses the question of the origin of the disease. It is shown that the disease is not necessarily due to a local cause, but may be the result of a general affection of the digestive system. The author also discusses the question of the prognosis of the disease, and shows that it is generally a self-limiting affection, and that it rarely leads to any serious consequences.

INTESTINAL IRRITATION.

I have had the opportunity of observing a large number of cases of intestinal irritation, and I have been struck by the frequency with which it occurs. It is not only a common affection of the digestive system, but it is also a disease which is often associated with other affections of the same system. The symptoms are generally those of a local inflammation, and the treatment is accordingly directed to the relief of the local affection.

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ESSAY FIRST.

SOME EFFECTS

OF

INTESTINAL IRRITATION.

TH**ERE** are some effects of Intestinal Irritation, which, although of an acute and alarming character, appear to me not to have been always understood in practice, or discriminated from some other morbid affections of a totally different nature and requiring a different if not an opposite mode of treatment,—and of which I have been unable to find any distinct account in medical writings.

The case resembles in many instances the most acute *phrenitis*,—and it is this form of the disorder in particular to which I wish to

draw the attention of the profession. In other instances the affection has assumed the character of inflammation of the intestines or peritonæum. Occasionally the seat and kind of pain have led to the suspicion of pleuritis. Or attacks of palpitation have suggested the idea of disease of the heart.

Very frequently two or more of these affections take their rise in succession, the first or second probably ceasing entirely before the subsequent one is established,—an event which has, I believe, often led to an erroneous idea of the *metastasis* of inflammation or other morbid affection from one organ to another.

The occurrence of this morbid affection is by no means unfrequent. This consideration, added to that of its resemblance in different instances to inflammation, induces me to think that it should be established and regarded, in its several forms, as a distinct class of disorders to be constantly distinguished from the latter disease.

The subject cannot, I think, be better introduced to the attention of the medical reader, than by presenting him with the following case taken from one of the most respectable journals of the day, and regarded by its intelligent au-

thor, and apparently by the editor, as affording an example of migratory inflammation or metastasis:—

CASE I.

Mrs. F. a young married lady, had felt unwell for some days in consequence of slight cold. Her medical attendant, Mr. F. had bled her copiously the preceding evening, apprehending symptoms of *enteritis*. She was of a spare and slender make, the mother of two children, generally healthy, but subject to *severe and frequent constipation of the bowels*, which seemed to form the ground-work of her present complaint.

“On my first visit,” the writer observes, “I found *enteritis* established in its *most acute form*, nor had the previous bleeding produced any mitigation of her sufferings. A vein was immediately opened, and she was bled *ad deliquium*; the warm bath, calomel and nitre of each three grains every four hours, and a solution of manna in strong senna tea, (the only laxative that could remain on her stomach,) were ordered. Next day the symptoms had remitted, but it was necessary to repeat the bleeding, and to apply many leeches to the abdomen. The bowels were now freely purged, the evacuations black and offensive to a degree I have seldom

witnessed. On the third day the mouth was sore, the abdomen free from pain, all the symptoms favourable, except a quickness of the pulse, which, I thought, was attributable to the action of the mercury: I therefore consigned my charge to my medical friend; but I was surprised, on the day but one succeeding, at being requested to see Mrs. F. again, and still more so, to find *very marked symptoms of inflammation of the brain*. These had come on in the course of the previous afternoon, without any intelligible reason, (except that the bowels had become constipated.) I was certain, from the prudence of Mr. F., that no stimulant, either in food or drink, had been given. The *intolerantia soni et lucis* was so great that she could not bear the slightest motion about her, nor hardly permit me light enough to conduct my examination. She complained of intolerable weight and oppression of the head, vivid flashes of light constantly before the eyes, urgent thirst, the tongue was coated, the pulse full and labouring, the skin hot, &c.; no delirium; no pain upon pressure of any part of the abdomen; the mouth still sore. Copious depletion was again had recourse to, a blister to the nape of the neck, the head wrapped in towels kept constantly wet with vinegar and water, large doses of ext. coloc. comp. with calomel twice a-day, assisted by the former

mixture of senna and manna, and a mixture of antim. tart. and potass. nit. every four hours. The pressure of other engagements prevented my seeing her oftener than every other day, a circumstance I the less regretted, from the constant attendance of her brother-in-law. At every visit but my last, I was obliged to bleed ad del. or until sensible relief was obtained, besides applying numerous leeches every day. She was never delirious, always protruded her arm for the lancet, and expressed the relief she felt while the blood was flowing; it never had a true buffy coat, but the crassamentum was remarkably firm and fibrous. After the second bleeding, the pain was confined to the right hemisphere, on which side a blister was applied and kept open till it formed a running sore. At my fourth visit the pain in the head was sensibly abated, but symptoms of *abdominal inflammation* had *supervened*. This the bleeding of that day conquered. The bowels, notwithstanding the large doses of purgatives, were with difficulty kept soluble; the disorder sensibly yielding as the evacuations became more natural. The soreness of the mouth, which never amounted to ptyalism, subsided during the attack, and never again recurred. At my sixth visit, I took leave of my patient with sanguine hopes of her permanent recovery; yet within a week I was *again* called to her, in con-

sequence of a *severe attack* of *pleuritis*. I understood that the pain in the head had *returned* a few days after I saw her, and that her brother had found it necessary to continue, in a modified degree, my plan of treatment. As she slowly recovered, difficulty of breathing, pain in the side came on, and at length *a very marked case* of *pleurisy* was established. Almost in despair, I again began the evacuating system, and at length had the pleasure of subduing this last attack, but not without repeated bleeding, leeching, and blistering. My patient was by this time terribly worn down, and in my opinion inflammation had nothing to fasten upon. However, a few weeks in the country soon restored her to her usual appearance."

I believe the following observations will render it most probable if not certain that this case was *not* one of inflammation, but of intestinal irritation, and of its effects on several organs in succession. If so, I need not insist on the necessity of forming an accurate diagnosis of these two diseases in order to the adoption of an appropriate mode of treatment. The case itself, which I reprint, notwithstanding the different view I take of it, with the approbation of its candid and liberal author, is indeed "peculiarly interesting and affords ample scope for medita-

tion." All of us, I think, have drawn similar conclusions from similar premises,—and if those conclusions be in fact erroneous, it is of the utmost consequence that they should be corrected.

I shall proceed to state in detail the principal circumstances relative to the causes, symptoms, diagnosis, history and treatment of this morbid affection, interspersing a few cases in illustration in such a manner as to convey an idea of the gradual formation of my opinions.

The Causes. The principal cause of this morbid affection is a state of intestinal irritation of some duration, arising from a loaded condition of the bowels or from a scybalous or disordered condition of their contents. But, although the presence of this cause appears essential to the production of the complaint, it is important to remark that I do not remember to have observed any example of it arising quite spontaneously from this cause *alone*. In every case there has been some superadded cause,—some shock sustained, or some extraordinary effort made on the part of the constitution, to rouse the dormant irritation into effect. Unusual fatigue, exertion, loss of rest, anxiety, or alarm,—a fall or similar *accident*,—exposure to wet or cold,—any cause of weakness and especially of exhaustion, and

particularly the combination of some of these circumstances always attendant on parturition, are the principal exciting causes of this affection. The patient has, in many instances, been subject to indigestion. And he is particularly liable to experience returns of the affection in the same or some other form, until the primary disorder and the consequent debility be finally removed.

The Symptoms. This affection generally begins in the manner of a sudden attack. This attack is usually ushered in by rigor,—indeed by a more distinct and decided rigor than is observed in many cases of inflammation; the rigor is usually soon followed by much heat of surface; with the heat the patient experiences some affection of the head, chest, or abdomen, and, indeed, more or less, of all:—there are vertigo on raising the head, pain, and some morbid impression on the mind,—panting in the breathing,—and fluttering about the heart,—with general hurry, irritability, and restlessness; the tongue is white and loaded: the alvine evacuations are morbid,—dark-coloured, fœtid, and scybalous,—or yellow like the yolk of egg,—or of the appearance of yeast; the urine is turbid and frequently deposits a copious sediment.

The further account of the symptoms will be best conveyed by a few cases selected with the

object of displaying the character of this affection.

CASE II.

Amongst the earlier cases of the effects of intestinal irritation which excited my attention was that of Mrs. Hawkins, a rather delicate, married woman, aged 35. When I was first called to this patient she appeared to labour under *inflammation of the peritonæum*,—the symptoms of which were so severe as apparently to demand the repeated employment of the lancet and application of leeches, so that the patient lost about thirty-five or forty ounces of blood; the bowels were freely purged,—the stools were very fœtid.

All the symptoms were removed on the third day, I only visited my patient once, and, like the author of the case already given, I had every hope of a speedy and secure convalescence. I was, however, equally doomed to be disappointed. Early on the succeeding day I received an *urgent* request to see her. She had been seized with severe pain of the head, especially over the eye-brows, attended by beating and throbbing, and by the most urgent intolerance of light—so that the eyes could not be opened for a moment for examination; the pain was increased on at-

tempting to sit up erect; the countenance was palish and sallow; the pulse full and frequent; there was no faintness or sighing.

As this case occurred early in my investigation of the effects of intestinal irritation, I hesitated in determining whether the symptoms were such as I had already witnessed in one or two cases as arising from that cause, or were indicative of inflammation within the head. I prescribed a draught with thirty drops of the tinctura opii and of the spiritus ammoniæ aromaticus, and called again in an hour and a half—not without anxiety. I was greatly relieved to find my patient better in every respect,—able to bear the light, suffering much less pain, and having enjoyed a comfortable sleep after a night of wakefulness and distress. Aperient medicine was administered, and, after the full evacuation of the bowels, light nourishment and a repetition of the draught with tinctura opii and spiritus ammoniæ aromaticus, whilst a cold lotion was applied to the head. On the succeeding day Mrs. Hawkins was better in every respect, but complained of any noise. On the next day she was comparatively well, only suffering from vertigo on raising the head. From this time the recovery was progressive and uninterrupted, the utmost care being taken to regulate the bowels and the diet.

This case appears to me perfectly similar to the one first given, and under similar management, or under the plan of treatment first adopted from the idea of its being inflammatory, would probably have been equally protracted and the attacks equally repeated in their various forms. It was, I now think, at first *mistaken* for *enteritis*: the symptoms were, in the second attack, those usually deemed indicative of *phrenitis* in its most marked form; yet these symptoms were removed, without the lancet, by an ammoniacal anodyne draught!—and the patient had a speedy, safe, and uninterrupted recovery.

CASE III.

The present case is one of still greater interest; for the patient himself is a most intelligent surgeon,* and the case is given in his own words. He had undergone a painful operation on the anus, which it is unnecessary to specify particularly here, and had suffered much for six days, especially on passing the fæces and on dressing the wound;—he had kept himself low, and had had restless nights as well as painful days. On the *sixth day*, after describing the pain and suffering he had experienced from the evacuation of the bowel, which contained scybalous fæces, and from the dressing of the wound, he says,

* Mr. Oldknow, of Nottingham.

“ I now began to experience great soreness and tenderness in the right groin, and down the back of the thigh; *my feet and legs became extremely cold*; but in about an hour’s time, by the application of warm flannels, bottles, and friction by the hands, and by taking a small basin of broth, the coldness and aching subsided; *I became generally heated*, and my mouth was clammy; there came on a general *soreness* of the skin, and especially of the eye-balls; my face was heated and flushed; my pulse gradually rose to 96; but I became quite easy, except from a tenderness in the groin. I took soda-water. I attributed this attack, in part, to a little exertion. At two o’clock in the afternoon *the chilness returned*, and was removed towards three, at which time I experienced *throbbing in my temples with headach*, and flying *stitches in my side*; pulse 112. I was bled to sixteen ounces; after which I began to perspire, and felt a little faint; the throbbing of the head ceased, but the pain continued; pulse 116. A little before five o’clock the perspiration had ceased, having been pretty general, but not profuse. I felt very much *overcome*, and general lightness and vertigo on moving; great thirst. At half after six o’clock my *faintness* continues; I am afraid of taking medicine for fear of sickness; I have pain of the head; and if I raise it from the pillow, I feel giddy and confused. My

skin is tolerably cool; my thirst continues; I feel very *restless*, and cannot help *sighing*; the *fan* and aromatic vinegar seem to revive me a little; if I dose, my breathing is alternately very prolonged and very rapid; pulse 108; tongue covered with a thin white mucous; the other groin is a little painful. 8 o'clock.—Much the same. I am directed to take a dose of calomel at bedtime, and of ol. ricini in the morning; to foment the groins and arms, and omit introducing the dressings."—On the *seventh day*, the patient dictated the following report. "In the early part of the night my *head* became *distractingly painful*, for which I applied cold wet cloths to my head, face and neck, with much relief; the *faintness* was very distressing. Between 11 and 12 o'clock I had a large glyster, composed of gruel and oil, which induced two stools, attended by great faintness; I took sal volatile and nourishment. After the second evacuation my head was relieved, but the faintness continued. I dozed at intervals until 3 o'clock, when I took the ol. ricini, with nourishment at short intervals. I had a copious stool at 6 o'clock, and vomited; my headach and faintness were much relieved; I slept comfortably, and perspired profusely. Betwixt 8 and 9 o'clock I had another motion; the pain of my head was quite gone, as well as the faintness, except after any exertion;

to have experienced a similar one formerly.

the stools were passed with ease; the pain of the groins abated, so that the wound was again dressed with lint; my pulse had got down to 92; I continued to take as much nourishment as I could bear. About 12 o'clock I fell into a sound sleep, which continued, with one trifling interruption, until 4, when I awoke in a profuse perspiration, had my linen changed, and felt considerably better. At the present time, 7 o'clock, I am quite free from pain and faintness; but I feel occasionally flushed, and have a strong disposition to perspire; pulse 84," &c.—I think it unnecessary to add the subsequent reports in this interesting case, as they relate to the local complaint, and will probably be published by the patient himself.

When I arrived to witness the symptoms just detailed, the patient had been bled from the arm at his own instance, and, being unrelieved, the leech-man was in waiting. The question was asked, ought the blood-letting to be repeated, or leeches applied to the temples? I decided without hesitation in the negative, and prescribed an emollient but copious enema, sal volatile, and nourishment. I left the patient past midnight, greatly relieved; the next day I found him free from symptoms of affection of the head!

This case illustrates several points of great importance:—1. the united effects of intestinal irritation, of pain, fatigue, and want of rest, of exertion, and, perhaps, of exposure to cold, and, afterwards, of blood-letting;—2. the *concurrence* of affections of *several* organs—of the head and of the chest;—3. the contrast of dissimilar modes of treatment,—the depletory plan only inducing a remission of symptoms which are to recur in the same or some other form,—whilst the removal of their common causes secures the patient against further attacks, a point also fully illustrated by Case II, contrasted with Case I.—The opinion which the patient had formed of his own case is plain from the treatment adopted in the first attack, and about to be pursued in the second. I should not have decided differently had I not already witnessed several cases of a perfectly similar nature, and cautiously watched their symptoms and ascertained the mode of cure. And I think most physicians would have apprehended, at least, some inflammatory affection within the head.

CASE IV.

The next case is that of Mrs. Darley, a young married lady, in the fourth month of pregnancy, habitually costive. The present attack came on after much fatigue in travelling; and she is stated to have experienced a similar one formerly.

On the 7th of October, she complained of pain of the head, and leeches were applied to the temples.—On the 8th the pain of the head was more violent and attended with much throbbing of the temples; and to these symptoms pain of the right side under the breast, a sense of tightness across the chest, and hurry in breathing, were superadded. Twelve ounces of blood were drawn, and an efficient aperient medicine was given, and on the 9th and 10th she was much better, and a saline medicine was prescribed.—On the 11th she was again taken worse, after imprudently sitting up; the beating of the temples, tightness across the chest, and difficulty in breathing returned, unattended by cough. Sixteen ounces of blood were taken from the arm, with great relief, and the aperient medicine was repeated; the patient was relieved, and continued better on the 12th.—In the night of the 13th the medical attendant received an urgent message to visit his patient, and found her with severe pain and beating of the head, great tightness and pain across the chest, and now with violent palpitation of the heart. Twelve ounces of blood were taken, and calomel and other aperient medicines given, with considerable relief.—On the 14th a physician was consulted, who prescribed the pil. hydrarg. with an aperient draught. In the night the apothecary was again

sent for, all the symptoms having returned, and now, for the first time, with the addition of a slight cough. Eight ounces of blood being drawn, great relief was obtained.—On the 15th the physician was again sent for; ten ounces of blood were taken, with great relief, an aperient, and a mixture for the cough prescribed, with eight drops of the tinctura digitalis purpureæ every four hours.—In the night of the 16th the medical attendant was again sent for,—all the symptoms had returned in a still more aggravated form, the pain of the head, tightness across the chest, palpitation, and cough being extremely severe. Eight ounces of blood were drawn without relief; the head was shaved, a cold lotion applied, and a blister ordered for the back of the neck.

On the 17th I saw the patient for the first time:—there were much pain and throbbing of the *head*, which felt benumbed and heavy as if she could not raise it from the pillow; there had been no sleep; the pupils were extremely small, with intolerance of noise and disturbance of any kind;—there were palpitation of the *heart* and sometimes faintness and a feeling of sinking or dying;—there were a sense of tightness across the *chest*, oppression in the breathing, and a peculiar tracheal or laryngal cough;—some pain in

the region of the *uterus* increased by pressure, but no vaginal discharge;—the countenance was usually pale, but sometimes flushed, the tongue extremely loaded, and even black at the back part, the alvine evacuations, on giving purgative medicine, were still, at first, dark-coloured, offensive, and scybalous,—and afterwards offensive and like yeast; the pulse was 120. I was forcibly struck by a general but marked resemblance of this case, to those already given, and to others of the same nature which I had witnessed:—the depleting plan already fully adopted and repeated had proved ineffectual in affording relief; the purgatives hitherto given, were, I believed, inefficient. The plan I proposed was to give efficient purgatives,—to restrain their operation by draughts with *tinctura opii* and *spiritus ammoniæ aromaticus*,—to support the strength by means of nourishment given every hour or oftener,—to procure sleep by anodyne enemata,—to guard against exertion or fatigue,—noise or disturbance.—The recovery was uniformly progressive; there was not even one recurrence of the painful attacks; the symptoms gradually disappeared, the pulse becoming natural, the pupils of the natural size, the head and chest being relieved, and the bowels daily but fully moved; quiet sleep, and a good appetite returned; in six days the patient was convalescent; shortly after-

wards she bore a long journey home without any ill consequence, and, at the proper time, had a safe delivery.

CASE V.

Mr. T. H. aged 19, complained on Sunday evening, September the 29th, of pain shooting through the region of the stomach to the back, recurring at intervals; he took some ginger tea, was relieved, went to bed, rose in the morning looking pale, but expressing himself better, went into the counting-house, and ate his dinner of cold roast beef as usual.—About five o'clock in the afternoon he became affected with coldness of the hands and feet, slight flushing of the face, violent and constant pain of the crown, or, as he said, of the “bones” of his head, numbness of the right hand and contraction of the right side of the lip, an incoherence of manner—answering hastily and sharply to any questions, restlessness and tossing about, and extreme intolerance of light or the least noise—desiring that the shutters might be accurately closed, and that the room-door should not be moved. About two hours after this attack sickness came on, a great load was vomited, and he became more collected, but still complained of pain of the bones of his head, and of the slightest light or noise. In an hour he fell into an uneasy slum-

ber, breathed hard through the nostrils, awoke in half an hour a little easier, his hands and feet becoming warmer. He took a cup of bohea tea, and a dose of calomel and jalap; at ten o'clock p. m. he lay more composed, then dozed at intervals but always complained on awaking of pain of the head; at two o'clock he slept more quietly; his medicine acted three times; he rose in the morning much refreshed but looking dull and sallow. He continued to recover during the day, rode out, ate his dinner, but still looked ill.

CASE VI.

In the cases already given the *head* was the part chiefly affected. In the present case the patient, Mr. Hastie, aged 40, was attacked with symptoms which were, I think, mistaken for *pleuritis*. He was bled profusely and lost nearly a gallon of blood. At first the pain was mitigated, but it always returned with unremitting violence, especially at the latter part of the treatment, when the relief afforded was also of shorter duration.

At this time I was consulted. The pain was referred to the *right side*, over the false ribs, and was excruciating on drawing a deep inspiration, but less so on breathing deep a second and third time; the pulse was about 86; the tongue white

and loaded. As blood-letting had been fully tried without effect, and as I entertained the opinion that the pain was symptomatic of intestinal irritation, rather than inflammatory, I prescribed a brisk purge, the operation of which was to be followed by the ammoniacal opiate draught. The motions were dark and fetid. This plan was repeated daily, with a strict attention to nourishment:—the pain *moved* to the *right breast*, and, afterwards, to the *back*, and was extremely severe on drawing a deep breath. By pursuing this mode of treatment, the pain gradually subsided; and on the 9th day of my visits, and 25th of the disease, it was nearly gone, and the pulse natural. During the continuance of the pain, much relief was obtained by the application of a liniment and fomentation.

At one time, the pulse was 120 from *mental agitation*, and continued frequent during several days; and there were hurry and agitation from any sudden noise, as that of the knocker, or of any thing falling on the floor,—a tendency to talking and delirium, restlessness and picking of the bed-clothes,—heat and perspiration during sleep. The operation of the medicine often induced faintishness; the face and hands were blanched. The purge was given daily, the draught with *tinctura opii* and *spiritus ammo-*

niæ aromaticus, three times a day; the liniment and fomentation when required for pain; and nourishment in small quantity almost every hour. The recovery was progressive, and without any untoward circumstance, except the effects of mental agitation just mentioned. The patient, however, continued to labour under derangement of the general health for some time.

CASE VII.

In this case, of which the heads only can be given, the patient was afflicted with great *palpitation of the heart* which returned in paroxysms. The attack would come on from various causes, induce great alarm and sense of dissolution, with throbbing along the abdominal aorta. The patient was bled profusely without more than temporary relief. He recovered gradually under the employment of purgative medicine, nutritious diet and soothing treatment, remaining only subject to dyspepsia.

Symptoms continued. The *general* symptoms have been already detailed, and the *local* complications have been illustrated, in some measure, by the cases. It will be necessary, however, here, to enumerate the latter more distinctly.

The affection of the *Head* consists of the most acute pain, the greatest intolerance of light, and sound, and the severest form of vertigo, wakefulness, and distress, and sometimes even delirium, and the pupils of the eyes are often extremely contracted.

The affection of the *Chest* is denoted by severe and acute pain of some part, which is apt to vary its situation, passing from one side to the other, or to the *back*, or occupying a situation higher up or lower down; this pain checks a deep inspiration, and even the ordinary breathing, to which it imparts a character of difficulty and anxiety.

When the *Abdomen* is affected, there are acute pain, and great tenderness under pressure, in some part, or more or less generally diffused. The attack and situation of the pain is such, in some instances, that the case is with difficulty distinguished from *gall-stones*, though it more generally resembles *enteritis*.

When the *Heart* is the seat of this affection, there are violent and terrific attacks of palpitation,—and the course of the carotids and even of the abdominal aorta, is sometimes the seat of violent pulsation or throbbing.

All these affections are apt to occur in sudden attacks, and to recur in paroxysms,—perhaps varying their form,—and exciting great alarm in the patient and his friends, who usually dispatch a hurrying message to the medical attendants.

The Diagnosis. I now come to the most important and difficult part of my undertaking. The preceding cases are sufficient to establish the fact that there *are* attacks which *resemble* inflammation of the head, chest, or abdomen, and yet which are totally different in their nature. This fact is, of itself, highly important. And if I should fail in giving sufficient diagnostic marks of these morbid affections, it will still be of the utmost moment to know, that the distinction is absolutely essential to the adoption of an appropriate mode of treatment; and that whilst we appeal to future experience to render the diagnosis more complete, the peculiarities of each case must be carefully seized in order to supply the deficiency of the general rule.

I would first observe that the attack from intestinal irritation, is, in general, more *sudden* than that of inflammation, which is generally formed somewhat more gradually. This circumstance must therefore be cautiously inquired into, and may *assist* the diagnosis.

I believe, too, that the seizure in the former case is attended by *more distinct rigor*, and afterwards by *greater heat*, than in the latter.

The case of intestinal irritation affects, in a marked degree, *more organs at once*, than that of inflammation, which is usually confined, at first at least, to one.

The state of the *tongue* and the condition of the *alvine evacuations* are far more marked by disorder, and the latter are far more offensive, in attacks from intestinal irritation than in cases of inflammation.

The affection of the *Head* from intestinal irritation comes on suddenly, is formed all at once, and is attended by great restlessness, suffering, and distress. In *phrenitis*, the disease is usually formed somewhat more gradually; the patient has been subject to pain of the head perhaps for some days or even longer; he complains less; or at least there is less urgent distress,—less distress of a general kind; the pain may be very severe, although it is more frequently rather obscure; the intolerance of light and sound is less urgent; the rigor, and subsequent heat, and the attack in general are less marked; the patient is not so soon *relieved* by remedies, and the tongue and

alvine evacuations are less morbid. In the attack of affection of the head from intestinal irritation, the patient is *relieved* perhaps completely if the lancet be employed, but the attack soon recurs with equal or greater violence; in phrenitis, the relief is seldom so complete, the interval of ease so long, or the return so marked,—the pain is *diminished*, perhaps, but gradually resumes its former violence, unless active measures be interposed.

When the *Chest* is affected from intestinal irritation, the pain is severe and acute, and increased by a full inspiration,—if the inspiration be repeated, however, a second and a third time the increase of the pain is less and less; the situation of the pain varies; there is no cough,—and no crepitus on making a full expiration. In all these respects the case differs from inflammation. The remarks already made respecting the relief from remedies, the tendency to a sudden recurrence of the pain, &c. in cases of affection of the head, apply equally here.

I had long remarked that there might be both acute pain and tenderness under pressure, of the abdomen, without inflammation; this state of things is frequently the result of intestinal irritation. It is distinguished from inflammation

by the *general* symptoms of this affection,—the mode of attack,—the effects of remedies. In inflammation, the surface is usually cool, the head unaffected, the patient remarkably quiet; in the case of intestinal irritation, or the contrary, there is generally much heat after rigor, the head is much affected, and the patient is restless and generally distressed, the tongue is loaded and perhaps swollen, the alvine evacuations are extremely morbid, and great relief is obtained by the free operation of medicine.

The History. In noticing some points in the history of this affection it will be impossible to avoid some slight repetitions of what has been already stated. But I think it will be of sufficient importance to give a connected view of the course of the affection, to render such repetition pardonable.

The attack generally takes place rather suddenly. It usually begins with severe rigor, which is succeeded by great heat of skin, and eventually by perspiration. With the rigor or heat, there is usually the accession of some severe local affection.

The changes in the course of the disease are, like the first attack, generally sudden. The

patient is better and worse, and the most urgent messages are sent, at different times, to the medical attendant.

Generally the patient will be found to have been previously subject to disorder of the bowels;—afterwards he is apt to experience similar attacks unless he be attentive to diet and regimen and to the state of his bowels.

Besides the circumstances already pointed out, there are some points of a very interesting nature which deserve to be particularly noticed in this place:—

1. It must have fallen to the lot of many physicians to witness very severe morbid affections, immediately consequent upon causes which appeared totally inadequate to the production of such effects.—A slight blow, or a trifling fall has appeared to induce serious and alarming indisposition. The truth is that there was already a disordered and loaded state of the bowels,—dormant until roused into effect by the accident.—A lady about 50 years of age, fell a few steps down stairs; she got up however and walked to the sofa; in a short time she was taken with chilliness, succeeded by heat of skin and the most intolerable pain of the head and sensibility

to light, noise, &c. She soon recovered on taking active purges alternated with the ammoniacal anodyne draught.

2ndly. Every physician must also have observed cases of apparent inflammation, which did not pursue the *usual course* of inflammation,—probably yielding sooner than is generally observed,—or receding altogether, and recurring in paroxysms. This course of the disorder is noticed in several of the cases given in this essay.

3rdly. The case is often *relieved*, perhaps, but obstinately refuses to *yield* to the lancet, recurring with great if not increased violence,—in a manner not observed in cases of inflammation.

4thly. In other instances the local affection ceases,—perhaps for a day or two even,—and then recurs, only attacking some distant part. In these cases it has often been thought that there had been a *metastasis* of the former local affection, whilst, in fact, the *cause of both* remaining unremoved, has exerted its influence through a different channel of sympathy and upon another organ.

5thly. In the same manner we sometimes observe cases apparently involving inflammation

of more vital organs than one, at the same time. Such cases may certainly occur. But it is my present object to show that appearances may be deceptive, and that the case may be different from inflammation, and dependant on a disorder remote from the parts affected.

6thly. In the last place, there have been many cases in which the expected traces of morbid anatomy,—the effects of inflammation within the head, chest, or abdomen,—have been absent altogether. This observation has been fully illustrated, in regard to the *brain*, in the recent works of M M. Parent Duchatelet, and Martinet,* and of M. Hebreart;† all these authors have noticed cases in which the *symptoms* of phrenitis existed, and yet not a trace of the effects of inflammation on dissection. The view which has been given of the effects of intestinal irritation may assist us in explaining an event which must have been witnessed by all who have in any degree pursued the study of morbid anatomy.

The Treatment. The mode of treatment comprises the full evacuation of the bowels,—

* De l'Arachnitis, pp. 24, 25.

† Annuaire Med. Chir. See Dr. Johnson's Review, No. X. pp. 435, 438; see also No. VIII, p. 731.

soothing by anodynes,—light nourishment,—and certain local remedies.

Before I make a few observations on each of these measures, I wish, however, shortly to discuss the question,—ought we ever to have recourse to the Lancet? If our diagnosis was early and certain, *perhaps* the lancet would never be required. But there are two reasons why it appears to me that, whilst we must use this remedy with every precaution, it should not be entirely discarded, even in cases of intestinal irritation. First, that which was originally irritation merely, may doubtless lead to a state of inflammation; the presence of much disordered fæces in the bowels, may not only irritate, and induce pain of that,—and of some remoter part, but may eventually induce inflammation, if long continued; and the lancet may be requisite as a *preventive*, if not as a cure. This observation applies especially to the attack of pain and tenderness in the abdomen;—much less so, I think, to the affection of the head. Secondly, in the case of intestinal irritation the diagnosis may not, until the symptoms of the affection be still further studied, be such as to remove all doubt as to the nature of the case. It will then be prudent to bleed for the sake of safety, whilst we enforce the other and more specific modes of treatment.

The bowels must be fully and freely evacuated. This alone, however, will not remove the symptoms of this distressing disorder, which appear to continue, after the original cause is removed, partly from the irritation occasioned by the purgative medicine and from the state of purging themselves, and partly from the degree of lowness and exhaustion induced. To remove these effects of the administration of purgative medicine, the draught of tinctura opii and spiritus ammoniæ aromaticus, on one hand, and light and fluid nourishment, on the other, seem to be absolutely necessary. This remark is highly important, for I have frequently known the practitioner disappointed who depended upon any *one* of the remedies mentioned. It is by the judicious combination of all, that we must hope to subdue the present symptoms, and, what is of equal moment, to prevent their recurrence.

The local applications are chiefly a cold lotion applied to the *head*,—a liniment applied to the *chest*,—and a fomentation and liniment applied to the *abdomen*, when the pain occupies one or other of these parts.

As it is my principal wish to be as brief as possible, I have not deemed it necessary to enter more into detail respecting the various remedies

to be employed. It is the objects which are to be attained which should be kept steadily in view, —viz. to prevent inflammation by cautiously bleeding, *if necessary*,—to remove the cause of the affection by free purging, to allay irritation by the ammoniacal opiate draught, to obviate exhaustion by nourishment, and to obtain relief for the local affection by the local remedies already enumerated. The same motive has especially induced me to give only such a number of Cases as might be just sufficient to establish the facts and lead to reflection, whilst I reserve it for future opportunities to pursue the investigation. I shall have attained my object if I shall have impressed the profession with the truth that phrenitis, and other inflammations of important viscera, are sometimes simulated by intestinal irritation,—and that an accurate diagnosis of these affections is still required in order that we may avoid dangerous measures, and adopt such as can alone cure the disease.

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ESSAY SECOND.

ON
SOME EFFECTS
OF
LOSS OF BLOOD.

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ESSAY SECOND.

ON

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OF

LOSS OF BLOOD.

THE subject of the present essay appears to me to have escaped, in great measure, the attention both of physiologists and of the practical physician. The immediate effects of a sudden hæmorrhagy or copious loss of blood are, indeed, sufficiently known. But I am not aware that any author has described with accuracy and distinctness the secondary or more remote effects of loss of blood, in the various circumstances of repetition or continued flow in which it may occur. And yet, when we reflect how often blood-letting is employed as a remedy, and how frequently hæmorrhagy occurs as a disease, it

must be considered of great moment, as well as interest, to trace the varied effects of a diminished quantity of blood on the different functions and organs of the animal frame.

This inquiry acquires a higher interest still, if, as I believe and hope to explain in the ensuing observations, the more obvious effects of loss of blood are such as to suggest the idea of increased power and energy of the system, and to lead to an erroneous and dangerous employment of the lancet when a directly opposite treatment is required.

It is now several years since I began the investigation the results of which I am about to detail. I had for some time contemplated an *experimental* inquiry, when several opportunities occurred to me, and one especially under extraordinary circumstances, of observing the effects of loss of blood in the human subject; and it will be readily apprehended how much more important it is to have observed the phenomena in question, in instances in which the mental affections and the sensations could be ascertained, as well as the changes in the other functions, than merely to have noticed effects obvious to the eye alone.

In stating the results of my observations on the effects of loss of blood, I propose to adopt the following arrangement:—

I. *Of the immediate effects of loss of blood—chiefly Syncope, and of the Reaction or Failure of the Vital Powers.*

II. *Of the more remote or cumulative effects of repeated or protracted loss of blood,—or Exhaustion;—and 1. Of Exhaustion with excessive Reaction. 2. Of Exhaustion with defective Reaction. 3. Of Exhaustion with Sinking.*

III. *Of the effects of further loss of blood in cases of Exhaustion;—1. Of the Substitution of Syncope for Reaction. 2. Of the Transition of the state of Reaction into that of Sinking. 3. Of Sudden Dissolution.*

IV. *Of the influence of various circumstances on the effects of loss of blood:—1. Of Age, &c. 2. Of Disease.*

V. *Of the effects of loss of blood on the internal organs;—1. The Brain. 2. The Heart. 3. The Lungs. 4. The Intestinal Canal, &c.*

I. *Of the immediate effects of Loss of Blood,—chiefly Syncope, and of the Reaction or Failure of the Vital Powers.*

The most familiar of the effects of loss of blood is Syncope. The influence of posture, and the first sensations and appearances of the patient, in this state, appear to denote that the

brain is the organ the function of which is first impaired; the respiration suffers as an immediate consequence; and the action of the heart becomes enfeebled as an effect of the defect of stimulus,—first from a deficient quantity of blood, and secondly from its deficient arterialization; the capillary circulation also suffers; and if the state of syncope be long continued the stomach and bowels become variously affected.

In ordinary syncope from loss of blood, the patient first experiences a degree of vertigo, to which loss of consciousness succeeds; the respiration is affected in proportion to the degree of insensibility,—being suspended until the painful sensation produced rouses the patient to draw deep and repeated sighs, and again suspended as before; the beat of the heart and of the pulse is slow and weak; the face and general surface become pale, cool, and bedewed with perspiration; the stomach is apt to be affected with eructation or sickness.—On recovery there is perhaps a momentary delirium, yawning, and a return of consciousness; irregular sighing breathing; and a gradual recovery of the pulse.

In cases of profuse hæmorrhagy the state of the patient varies:—there is at one moment a greater or less degree of syncope, then a degree

of recovery. During the syncope the countenance is extremely palid,—there is more or less insensibility,—the respiratory movements of the thorax are at one period imperceptible and then there are irregular sighs,—the pulse is slow, feeble, or not to be distinguished,—the extremities are apt to be cold, and the stomach is frequently affected with sickness.—There are several phenomena observed in this state particularly worthy of attention. I have observed that when the movements of the chest have been imperceptible or nearly so, in the interval between the sighs, the respiration has still been carried on by means of the *diaphragm*. It may also be observed that the state of syncope is often relieved, for a time, by an attack of sickness and vomiting, immediately after which the patient expresses herself as feeling better, and the countenance is somewhat improved, the breathing more natural, and the pulse stronger and more frequent. It may be a question, in this case, whether the state of syncope increases until it induces sickness; or whether the stomach be nauseated by the ingesta usually administered, and the syncope be, in part, an effect of this state of the stomach. In either case the efforts to vomit, are succeeded, for a time, by an ameliorated state of the patient. In cases of fatal hæmorrhagy there are none of these ameliorations. The symptoms gradually

and progressively assume a more and more frightful aspect. The countenance does not improve but becomes more and more pale and sunk; the consciousness sometimes remains until at last there is some delirium; but every thing denotes an impaired state of the energies of the brain; the breathing becomes stertorous and at length affected by terrible gasping; there may be no efforts to vomit; the pulse is extremely feeble or even imperceptible; the animal heat fails and the extremities become colder and colder in spite of every kind of external warmth; the voice may be strong, and there are constant restlessness and jactitation; at length the strength fails, and the patient sinks, gasps, and expires.

From the state of syncope the system usually recovers itself spontaneously, if the cause by which the syncope was induced, be discontinued. The principle by means of which this recovery is affected, may, without involving any hypothesis, be denominated *reaction*.

This reaction of the system may, under different circumstances, be excessive or defective, or it may be destroyed altogether and yield to an opposite condition of the vital powers, or *sinking*,—or to dissolution,—each state leading to a corresponding series of phenomena. The

description of these varied phenomena is reserved for the ensuing section.

Previously to leaving this part of our subject, it may be proper to notice that the brain is sometimes affected by loss of blood, in a very different manner, and instead of syncope, there are attacks of convulsion. Dr. Kellie observes that “fits resembling apoplexy and epilepsy, as well as fits of syncope, occasionally supervene to venesection at the arm;”^{*} and Dr. Armstrong states that “bleeding to syncope in young children may sometimes lead even to fatal convulsions.”[†]

II. *Of the more remote or cumulative effects of repeated or protracted loss of blood,—or Exhaustion.*

The reaction or recovery from ordinary syncope is generally a simple return to a healthy state of the functions or nearly so, the pulse not passing beyond its natural frequency. In cases of profuse loss of blood, on the contrary, the recovery is not quite so uniform, and the pulse acquires and retains a morbid frequency for a certain length of time; this frequency of the pulse

^{*} Edinb. Med. Chir. Trans. Vol. 1. p. 105.

[†] On Puerperal Fever, 2d. Ed. p. 191.

gradually subsides, however, and is unattended by any other symptom of indisposition of any consequence.

The phenomena are very different, if, instead of one full bleeding to syncope, or of a profuse hæmorrhagy and even protracted syncope, the person be subjected to repeated blood-lettings or to a continued drain. In this case, within certain limits, the pulse, instead of being slow and feeble, acquires a morbid frequency and a throbbing beat, and there are, in some instances, all the symptoms of *excessive reaction* of the system, which it is my object now to describe.

The state of excessive reaction is formed gradually, and consists, at first, in forcible beating of the pulse, of the carotids, and of the heart, accompanied by a sense of throbbing in the head, of palpitation of the heart, and eventually perhaps of beating or throbbing in the scrobiculus cordis and in the course of the aorta. This state of reaction is augmented occasionally by a turbulent dream, mental agitation, or bodily exertion. At other times it is modified by a temporary faintness or syncope.

In the more exquisite cases of excessive reaction the symptoms are still more strongly marked, and demand a fuller description.

The beating of the temples is at length accompanied by a throbbing pain of the head, and the energies and sensibilities of the *brain* are morbidly augmented; sometimes there is intolerance of light, but still more frequently intolerance of noise and of disturbance of any kind, requiring stillness to be strictly enjoined, the knockers to be tied, and straw to be strewed along the pavement; the sleep is agitated and disturbed by fearful dreams, and the patient is liable to awake or to be awoke in a state of great hurry of mind, sometimes almost approaching to delirium; sometimes there is slight delirium, and occasionally even continued delirium; more frequently there are great noises in the head as of singing,—of crackers,—of a storm,—or of a cataract; in some instances there are flashes of light; sometimes there is a sense of great pressure or tightness in one part or round the head, as if the skull were pressed by an iron nail or bound by an iron hoop.

The action of the *heart* and *arteries* is morbidly increased, and there are great palpitation, and visible throbbing of the carotids and sometimes even of the abdominal aorta,—augmented to a still greater degree, by every cause of hurry of mind or exertion of the body, by sudden noises or hurried dreams or wakings; the patient is

often greatly alarmed and impressed with the feeling of approaching dissolution; the state of palpitation and throbbing are apt to be changed, at different times, to a feeling of syncope; the effect of sleep is in some instances very extraordinary—sometimes palpitation, at other times a degree of syncope, or an overwhelming feeling of dissolution; the pulse varies from 100 to 120 or 130, and is attended with a forcible jirk or bounding of the artery.

The *respiration* is apt to be frequent and hurried, and attended with alternate panting and sighing; the movement of expiration is sometimes obviously and singularly blended with a movement communicated by the beat of the heart; the patient requires the smelling bottle, the fan, and fresh air.

The skin is sometimes hot; and there are frequently general hurry and restlessness.

In this state of exhaustion, sudden dissolution has sometimes been the immediate consequence of muscular effort on the part of the patient.

The phenomena of excessive reaction are most observed in young persons of a robust constitution, who have been subjected to repeated blood-letting. In infants, in feeble persons, and in

rather advanced years, reaction after loss of blood, is apt to be *defective*. In this case the patient remains long pale, thin, and feeble, and becomes faint on the slightest occasions; the pulse is frequent but feeble and perhaps irregular, and we shall look in vain for the throbbing and palpitation observed in the young and robust. This state either gradually yields to returning strength, or subsides into the state of sinking. In the study of the effects of loss of blood it is particularly necessary to bear in mind this difference of the phenomena arising out of the state of the constitution,—of vigour, or of feebleness of the patient.

The symptoms of exhaustion with excessive reaction may gradually subside and leave the patient feeble but with returning health; or they may yield to the state of *sinking*. This term is adopted not to express a state of negative weakness merely, which may continue long and issue in eventual recovery, but to denote a state of positive and progressive failure of the vital powers, attended by its peculiar effects, and by a set of phenomena very different from those of exhaustion with reaction.

If in the latter the energies of the system were augmented, in the former the functions of the

brain, the lungs, and the heart are singularly impaired. The sensibilities of the *brain* subside, and the patient is no longer affected by noises as before; there is, on the contrary, a tendency to dozing, and gradually some of those effects on the muscular system which denote a diminished sensibility of the brain supervene, as snoring, stertor, blowing up of the cheeks in breathing, &c.; instead of the hurry and alarm on awaking as observed in the case of excessive reaction, the patient in the state of sinking, requires a moment to recollect himself and recover his consciousness, is perhaps affected with slight delirium, and he is apt to forget the circumstances of his situation and, inattentive to the objects around him, to fall again into a state of dozing.

Not less remarkable is the effect of the state of exhaustion with sinking on the function of the *lungs*; indeed the very first indication of this state is, I believe, to be found in the super-vention of a *crepitus* in the respiration, only to be heard at first on the most attentive listening; this crepitus gradually becomes more audible and passes into slight rattling, heard in the situation of the bronchia and trachea; there is also a degree of labour or oppression in the breathing, inducing acuteness in the nostrils, which are dilated below and drawn in above the lobes at each

inspiration; in some cases there is besides, a peculiar catching, laryngal cough, which is especially apt to come on during sleep, and awakes or imperfectly awakes the patient.

The *heart* has, at the same time, lost its violent beat and palpitation, and the pulse and arteries their bounding or throbbing.

The stomach and bowels become disordered and flatulent, and the command over the sphincters is impaired.

The last stage of sinking is denoted by a pale and sunk countenance, inquietude, jactitation, delirium, and coldness of the extremities.

CASE I.

The symptoms of exhaustion first with reaction, but gradually passing into the state of sinking, are exemplified in a remarkable manner in the following case, the circumstances of which were the more accurately noticed as they occurred in the person of a much respected friend and intelligent member of the profession, and principally under my own roof.—Mr. C. C. aged 40, of an extremely muscular and robust make, was returning from Nottingham into the coun-

try on the 3rd of October, 1821, when his horse reared, fell backwards upon him, and fractured the third and fourth ribs of the left side of the chest; he was taken to an inn, and I saw him with a surgeon, early on the following morning. He then suffered extreme pain of the side, there was a distinct crepitus, but no emphysema; the face was somewhat bruised and swollen and ecchymosed; the pulse was 100 and strong. Sixteen ounces of blood were taken from the arm, and a dozen leeches were applied to the temples and the same number over the fracture of the ribs; the motions of the chest were restrained by a tight bandage, and calomel and purging medicine were freely given.—At noon sixteen ounces of blood were again drawn from the arm, and a surcingle was applied round the chest.—During the whole of the 5th of October, or *second* day after the accident, Mr. C. appeared to be going on well, but at night a violent attack of pain of the side induced him to bleed himself; this was done to syncope, and as a large wash-hand basin was used to receive the blood, its quantity was not known but must have been very considerable; seventeen leeches were then applied to the side and shoulder; great relief was obtained, and the surcingle which had been removed, was re-applied, and the mercury and purgatives were continued.—Early on the morn-

ing of the *third* day, there was another violent attack of pain of the side with dyspnœa; a messenger was despatched for the medical attendants, but before their arrival Mr. C. had again bled himself, and taken sixteen ounces of blood, being unable to endure the pain; in another hour eight ounces more blood were drawn, the patient sitting upright; this was followed by syncope and great relief from the pain.

On the *fourth* day Mr. C. was removed a distance of about one mile to my house, and bore the journey on a litter extremely well, having previously lost a teacupful of blood; he expressed himself as feeling better than at any time since the accident. In the evening an increase of pain took place and about seven ounces of blood were taken with great relief.

In all it would appear that Mr. C. lost at least 120 ounces of blood.

On the *fifth* day we were joined in consultation by an eminent physician and surgeon. There was much pain of the side; and it was at first proposed to take away more blood. But I had observed some of the symptoms which I knew to indicate reaction from exhaustion, and the venesection was omitted, and the application of

leeches proposed; the symptoms increased, however, and the leeches were not applied.

On the *sixth* day the following circumstances were noticed. There were some degree of dyspnoea and of pain in the side; and the patient had removed the surcingle in the hope of obtaining relief; the mouth was affected with ptyalism.—The pulse was 100, and had acquired a peculiar jirk; there were violent throbbing of the carotids, a pulsatory pain of the head, and intolerance of noise and, in a slight degree, of light; at one time in the morning of this day, great agitation had been induced by a knock at the door. On account of the intolerance of sound, the pavement was directed to be strewed with straw, and the ringing of the bells of the adjacent church to be avoided. The bowels were freely moved; a draught with tinctura opii and spiritus ammoniæ aromaticus was given,—with broth, arrow root, sago, &c.

Seventh day. The patient was rather better towards evening yesterday. All the symptoms of strong reaction continued as before. The head has been much relieved by the application of a cold lotion.

On the succeeding day the pulse was 84 only, and had lost, in some degree, its peculiar jirk;

the carotids beat less violently ; the head was so much better as to render the lotion unnecessary ; there were more tranquillity and some hilarity of mind. The aperients, the anodyne, and the nourishment were continued.

I saw my patient about 3 o'clock a. m. on the *ninth* day, and I then heard the slightest degree of that crepitus in the breathing which I have already noticed as one of the first symptoms of sinking. The medical gentlemen met at nine, and the general symptoms were then so little changed that no degree of alarm was excited in their minds ; I mentioned my fears and the ground on which they were formed. At this meeting cupping was proposed ; but the changes in the patient were afterwards so rapid that brandy was recommended in the evening. The pulse was 110, in the middle of the day, unattended with its previous force and jirk, and easily compressible ; the beating of the carotids had subsided ; a slight degree of stupor was observed ; on being left undisturbed, the patient fell asleep and snored ; there was some labour in the respiration, and a troublesome, dry, laryngal cough, and although the bandage was loose there was no pain of the side of the chest ; the countenance was anxious. The symptoms assumed a more and more alarming form during the day ;

at night there was considerable stupor, and when the patient was roused there was sometimes a degree of delirium; during this sleep there were much snoring, and puffing up of the cheeks in expiration, something like the symptom which the French writers call "fumer la pipe"; on awaking, he would feel greatly concerned that he should have appeared to blow in your face; there was much flatulence; the motions were extremely offensive and passed at each attempt to void urine.

From midnight he could scarcely be roused; but if awoke he would speak collectedly but in a hurried manner and said he felt "such a dying feel;" the pulse was about 120.—I saw my patient at 3 o'clock a. m.; there was little change in the pulse or other symptoms; but in a minute or two the pulse became slow, feeble, and irregular, he altered rapidly, and I found that he was moribund; he expired in a few minutes more.

On dissection the pleura was found morbidly red in the vicinity of the fracture, but not wounded; there was some effusion of lymph in its cavity. The right lung was found united to its contiguous pleura by old adhesions.

CASE II.

Mrs. Burrows, aged 28, of a stout constitution.—After delivery there was uterine hæmorrhagy, which continued to recur for the twelve subsequent months. It was then discovered that Mrs. Burrows laboured under polypus uteri;—a ligature was applied, purgative medicines given, and the patient presently recovered.—The case is introduced in this place, in order to present the detail of symptoms arising from a *continued drain* or loss of blood. There were, 1. beating of the temples, a sense of “knocking” in the head, vertigo, dimness of sight, and singing in the ears, terrific dreams, and starting from sleep; 2. frequency of the pulse, pulsation of the carotids and aorta, fluttering and beating of the heart, faintishness, and a sense and fear of dissolution;—the palpitation of the heart was sometimes such on awaking as even to move the bed clothes, the bed, and, it is said, even the door; 3. the breathing was short and hurried, sometimes with panting, sometimes with sighing; 4. there were urgent calls for air, for opened windows, and the smelling bottle, and the nostrils and temples were required to be bathed with sal volatile or vinegar.

The countenance, prolabia, and tongue were pallid; the legs somewhat œdematous; the bow-

els were irregular, the secretions morbid; once there was obstinate constipation; frequently the bowels were merely confined, sometimes with sickness, but always with an increase of all the symptoms.*

It would be difficult perhaps to offer any observations on the nature and cause of excessive reaction; but it is plain that the state of sinking involves a greatly impaired state of the functions of all the vital organs, from defective stimulus,

* I have already described, in a cursory manner, some of the effects of loss of blood, in two recent publications; the first in 1820, entitled "Cases of a Serious Morbid Affection arising from Irritation and Exhaustion," the other in 1822, "An Essay on the Symptoms and History of Diseases," see chap. V. Since these periods I have seen several allusions to this important subject, and one especially by Mr. Cooke, in his useful and able abridgment of Morgagni; the observations of this author are highly valuable; and they have been confirmed by Dr. Kellie, † and as far as the *symptoms* go, as will be seen in the works alluded to, by myself.—Mr. Cooke observes,—“After uterine hæmorrhage, and also after copious depletion on account of pulmonary and other inflammations, I have frequently observed the symptoms of cerebral congestion—and which has generally appeared to arise from the excitement occasioned by some mental effort, though occasionally it has arisen without an evident cause. Whilst the other parts of the body appear comparatively bloodless, the vessels of the head throb violently; there is severe pain; confusion of intellect, sometimes to such a degree as to threaten delirium; the pulse at the wrist is usually small and vibrating, and the countenance distressed. When I first observed these symptoms I was led to abstract blood, from an apprehension of phrenitis; but I did harm: for if the urgency of symptoms was diminished, the susceptibility to a recurrence was increased, and restoration to health was protracted. The liability to this form of cerebral plethora has appeared to me to be proportionate to the preceding hemor-

† Edinb. Med. Chir. Trans. Vol. 1. p. 105.

and especially of the brain;—the tendency to dozing, the snoring and stertor, the imperfect respiration, the impaired action of the sphincters, the defective action of the lungs and the accumulation of the secretions of the bronchia, the feeble and hurried beat of the heart and pulse, the disordered state of the secretions of the stomach and bowels, and the evolution of flatus, all denote an impaired condition of the nervous energy. The state of sinking may, indeed, in

rhage, and the consequent debility. If in this condition an intrusive visitor be admitted to converse, though but for a short time, with the patient—or if the patient attempt to read, or in any other way to employ the mental faculties beyond what is perfectly easy—or if the mind be agitated, this state of the head will almost inevitably be induced. It may, however, be brought on by all those causes which tend to destroy the equilibrium of circulation; and none are more likely, in this condition of the patient, than noise in the room, deficiency of sleep, improper food, a constipated state of the bowels, or a morbid state of the secretions into them. This susceptibility to local congestion after excessive loss of blood, I presume depends upon the want of that due balance which, in a state of health, subsists between the nervous and vascular systems; but I am jealous of hypothesis in medicine, and to pursue them in the present work would be unwarrantable." Vol. 1. p. 73.

“From the peculiarity of the conformation of the nose, epistaxis is sometimes a most uncontrollable form of hemorrhage. I have recently seen two cases in which if it were not absolutely the occasion of death, it certainly accelerated that event. The first was in a gentleman who laboured under hydrocephalus. He was a susceptible man, and would not endure a plug in the nostril. The hemorrhage frequently occurred; and when he had become excessively pallid from loss of blood, it was curious to observe to what an extent the irritative hemorrhagic action was propagated. At first he only distinguished pulsation in and about the nose, but as his strength decreased, and his anxiety and susceptibility were heightened, the carotids could be seen throbbing vehemently, and a corresponding action was preceptible to the pa-

certain points of view, be compared with the state of the functions in apoplexy, and to the effects observed on abstracting the influence of the brain and spinal marrow by dividing the eighth pair of nerves or destroying the lower portion of the latter organ.*

III. *On the effects of further loss of blood, in cases of Exhaustion.*

The symptoms of exhaustion with reaction have, I am persuaded, frequently been mistaken for those of *inflammation* or other disease of the *head* or of the *heart*. Under this impression recourse has frequently been had to the further de- traction of blood by the lancet. And the effect

tient through their ramifications. The second case was in an old arthritic sufferer, who had been seized with cynanche parotidæa. The more acute inflammation had subsided, but the gland was much enlarged and indurated, and the jaw nearly rigid. In this state he was attacked with bleeding from the nose. It occurred sometimes when he was asleep, on which occasions he was threatened with suffocation from the formation of coagula in the fauces, which he removed with the utmost difficulty in consequence of being unable to open his mouth. The hemorrhage commenced in the nasal cavity nearest to the enlarged gland, but it afterwards took place from both nostrils. He was excessively afflicted with gout, and had indications of hepatic disorganization; but the immediate cause of death was the repeated effusion of blood. The hemorrhagic action was not so extensively manifest as in the preceding case; but when there was feebleness in the radial artery and the extremities were cold the patient was conscious of a strongly irritative throbbing in the arteries ramifying through the nose and the circumjacent parts." V. 1. p. 110.

* See Dr. Philip's work on "the Vital Functions" passim.

of this practice is such as greatly to impose upon the inexperienced,—for all the symptoms are perhaps fully relieved.

It was some time before I could fully comprehend the nature of this fact. I had satisfied myself that, in certain cases the symptoms were those of loss of blood; and yet it appeared no less certain that those very symptoms were relieved by the lancet. At length I discovered, by a careful observation that the symptoms which were relieved were those of reaction; and that the mode of relief was by the substitution of syncope; that the relief endured as long as the state of faintishness continued, but returned as this state gave way to the rallying and reaction of the vital powers.

Another circumstance equally interesting and curious was, that within certain limits, the remedy which relieved for a time, eventually only added to the severity of the malady, for that this was apt to return after a certain period, in a still more aggravated form. It is natural, indeed, to suppose that, unless there was a tendency to the failure of the vital powers, the reaction of the system and the painful circumstances attending it, would be greater after a third or fourth loss of blood, than after a first or second; indeed

there are seldom the symptoms of reaction after one flow of blood, however great or profuse; it is the repetition or protraction of the cause which, as I have already observed, is essential to produce this effect.

It is observable too that in cases of exhaustion with reaction, syncope is very soon produced by the further loss of blood. This fact is of importance because it may be regarded as a *sign* of the state of exhaustion when this is obscured by the reaction of the system, and as a warning voice against the further and inconsiderate use of the lancet.

If the loss of blood be repeated still further, not only syncope, but a state of sinking is induced; the effects of reaction are, of course, in this case, permanently relieved, whilst a different series of phenomena, already fully described, is established. This transition of reaction into sinking may either be spontaneous, as in the case of Mr. C. C. detailed in the preceding section, or it may be the effect of a last bleeding, the state of syncope scarcely ceasing, no reaction following, but the total though gradual failure failure of the vital powers.

These facts are illustrated by the following cases:—

CASE III.

Mrs. Darker aged 21, and of a rather feeble constitution, was confined of her first child; the bowels had been constipated, and were moved several times by a dose of castor oil, but becoming again confined she became much indisposed on the fifth day, with flushing of the countenance, noise in the ears as of a rushing wind or the explosion of crackers, flashes of light on lying down, beating of the carotids, &c. the pulse being 120 in a minute. Fourteen ounces of blood were taken from the arms, which induced *deliquium* with *relief* to the symptoms.—About seven hours afterwards the noises in the head had returned and the pulse was 120; twelve ounces of blood were again drawn and the patient again fainted. Eight ounces of blood were taken the next day. On the succeeding day the medical attendant was called early in the morning; there had been little sleep but much lowness for several hours; the patient then complained of violent beating in the head; the pulse was 120. A teacupful of blood was taken which *induced faintishness and abated the beating of the head*.—By noon, she was again flushed and the beating had returned in an aggravated degree.—From this period the patient was bled no more; but recovered under the influence of aperient and anodyne remedies.

CASE IV.

Mrs. D. aged 35, was confined in June, 1818; the expulsion of the placenta was followed by much hæmorrhagy which induced great exhaustion. On the tenth day she was seized with severe shivering, heat, throbbing pain of the head, and intolerance of light and sound; ten ounces of blood were taken from the arm, about 10 o'clock a. m., *which induced faintishness and relief.* At 7 o'clock in the evening, the pain of the head was as severe as ever; twelve ounces of blood were taken from the arm; this was followed by dreadful faintness, and gasping breathing, so as even to lead to the apprehension of dissolution;—on recovering the pain and intolerance of light and sound returned as before. This patient became affected with all the symptoms of exhaustion with reaction, but gradually recovered without further venesection.

When the last bleeding has been considerable, it has, in some cases, been followed by the most dreadful gaspings and other convulsive motions, and death. It should be observed that between the most gradual sinking and the most sudden dissolution, as the effects of bloodletting, there is every intermediate shade, with the phenomena of which it is of the utmost importance to be

acquainted. These varied phenomena may, I think, be collected from the observations which have been made in this and the preceding sections. They are further illustrated by the following cases which exemplify the fatal effects of loss of blood, as supervening *more* and *less* gradually upon the use of the lancet.

CASE V.

Mrs. — aged 30, had been affected with what appeared to be a slight attack of influenza; she was seized with rigor and soon afterwards the pains of labour came on and issued in delivery in about fifteen hours, at 9 o'clock a. m., which was followed by much fever, the countenance being flushed, the pulse frequent, and the breathing difficult with incessant cough; these symptoms increased towards evening and in the night, and about forty ounces of blood were drawn from the arm at two bloodlettings, and the next morning twelve leeches were applied to the chest, with great relief. In the evening a blister was applied.—The night was passed more comfortably; she dozed a little and was cheerful, and continued relieved in the morning. As a preventive against a relapse, however, three teacupfuls of blood were taken. The patient became faint during the flow of the blood,—sank

from that time, and never again rallied; she became extremely feeble and could scarcely articulate, and from being cheerful the day before, was now impressed with the conviction of approaching dissolution and expressed herself as unable to recover from the last bleeding. During this day, Saturday, and during the two succeeding days there was a state of extreme exhaustion,—and still a sense of load at the chest, and pain of the side.—On the Tuesday the countenance was observed sometimes to flush to a deep scarlet, and then to become quite pallid, and a profuse perspiration frequently ran down the face; the pulse was extremely frequent, and the pain severe on coughing; there was no delirium though she awoke hurried from sleeps which she described as “just like death.” During the four following days there was little obvious change; distressing faintings usually came on about two or three o’clock p. m. On the Sunday, she became drowsy and evidently more sinking; this state continued to increase, and she died in the evening of the succeeding day.

CASE VI.

The last bleeding, in the case just given, was obviously though rather gradually fatal. In the present case, the fatal event supervened immediately on the use of the lancet. Mrs. V. of pale

and sallow complexion and weakly constitution. Six days before her confinement of her first child, she was awoke in the night by severe pain of the head confined to one spot. This pain continued several hours, when Mrs. V. applied to her medical man; she was completely relieved by losing sixteen ounces of blood followed by purgative medicine, and she continued well.—Mrs. V's labour occurred on the 1st of September, 1817, and was rather tedious, but natural, and she had no complaint until the second day, when she experienced a second attack of pain in the head, but less violent than the previous one. She was seen six hours after this attack; she then complained of pain and beating of the head, about the anterior part of the right parietal bone; the skin was hot, and the pulse frequent and strong.—Sixteen ounces of blood were taken from the arm, leeches were ordered to be applied to the temples, and an enema and purgative medicine were prescribed. In three hours' time Mrs. V. was again visited, and it was deemed necessary to abstract more blood.—Six or eight ounces were therefore taken;—faintishness was induced,—and the symptoms were abated.—On the succeeding morning, September the 4th, the symptoms still remained the same; the surface was hot; the bowels had been purged and the evacuations were natural.—The saline

mixture was ordered.—At noon the symptoms remaining as before, the purgative medicine was repeated and a blister was applied.—In the evening, the evacuation of the bowels was satisfactory; the pain of the head was not severe, but there were much beating and a rushing noise; there were restlessness, and a teasing, irritative cough.—A draught with thirty drops of the tinctura opii was administered.—The next morning, September the 5th, Mrs. V. expressed herself as being much better from having enjoyed comfortable sleep. The surface was still hot, and the head still affected as before.—In the evening, there was a degree of tenderness in the region of the uterus. She dreaded the idea of being bled, from the faintishness she had before experienced from it, and said it would certainly kill her.—On the morning of the 6th, the pain in the region of the uterus was relieved, the head was affected as before, the window was kept open for want of air.—In the evening Mrs. V. complained of being faint and low. A mixture with camphor and sulphuric æther was prescribed.—On the 7th. the irritative cough again occurred; the pulse was frequent, from 120 to 130; and the other symptoms remained unabated.—A physician was consulted.—Sixteen ounces of blood were directed to be taken from the arm; a grain of calomel was given every three hours,

and the effervescing medicine was ordered.— On the morning of the 8th. Mrs. V. appeared to be relieved in every respect; the heat of surface and the pain of the head were diminished; the blood presented the buffy coat.—It was thought proper to abstract more blood, as the last bleeding had apparently conferred benefit, and had been borne better than the preceding ones. Four teacupfuls of blood were taken;—the most dreadful fainting followed, with gasping, open mouth, a convulsive action of the diaphragm,—and in an hour or two death closed the scene.

IV. *Of the influence of various circumstances on the effects of loss of blood.*

The first and principal circumstance which modifies the effects of loss of blood, is that which relates to the *strength* of the patient. Cæteris paribus, the degree of reaction is proportionate to the degree of strength. In infancy, in declining years, and in the feeble in constitution, there is *defective reaction* after loss of blood, the phenomena of which have been already detailed; the state of syncope is a state of danger; and a second or a third bloodletting is borne with difficulty. In youth, and in the vigorous and robust, on the contrary, the reaction is strong, and especially marked after repeated venesections.

In the strong the state of sinking is ever preceded by that of great reaction, unless indeed the strength be overwhelmed by the degree or early repetition of the evacuation; in the feeble it steals on insidiously and gradually unmarked by reaction of the system.

The other circumstances which exert an influence on the effects of loss of blood, are certain states of disorder or disease. And I must, in this place, particularly remark that the state of intestinal irritation is particularly apt to lead to those effects of bloodletting which I have described as exhaustion; whilst that of inflammation seems to protect the system from the effects of loss of blood:—in the former case throbbing is soon induced, unless, indeed, it be prevented by a state more nearly allied to syncope; in the latter, bloodletting is followed by little of reaction until the state of inflammation be subdued, and the system be freely exposed to the uncontrolled influence of loss of blood; in the former there is danger from full depletion; in the latter, this measure is providentially not less safe than necessary.

The phenomena of reaction seem readily to assimilate with the constitutional effects of intestinal irritation, as is distinctly apparent in some

of the cases given in the last section; they are, on the contrary, to a certain degree incompatible with those of inflammation: so that during the existence of acute and active inflammation, the symptoms of exhaustion are seldom observed, but they are apt to display themselves immediately on the active state of inflammation being subdued; whereas exhaustion and intestinal irritation appear to co-operate in inducing a state of reaction in the system.

In all cases we are only to expect the phenomena of reaction when a *certain quantity* of blood has been lost; one bleeding, although large, and even a continued drain, if not considerable, will not induce exhaustion; the powers of the system are sufficiently great to *recruit* and to *restrain* its actions.—But exhaustion is sooner induced under circumstances of intestinal irritation and less so under those of inflammation than in health, and reaction is the consequence, unless the strength of the patient be low, and then the reaction is defective, or even gives way to a state of positive sinking.

Each successive bloodletting, is of course attended with increasing risk. There is considerable danger where the reaction is strong; still greater when it is feeble. A large bloodletting

in such cases may be followed by sudden death. There is great danger when fainting has been several times induced, and where there is the least tendency to "want of air."

V. *Of the effects of loss of blood on the Internal Organs.*

We are altogether in want of a series of observations on the effects of loss of blood on the internal organs.

There is, I think, reason to suppose that a state of exhaustion from loss of blood, may lead to effusion into the ventricles of the brain; and a case* published by the late Dr. Denman sufficiently proves that such a state of exhaustion is no protection against an attack of apoplexy. From these circumstances we may conclude that there is, even in cases of exhaustion from loss of blood, increased action or fulness of the vessels of the brain.

The morbid state of the secretory function of the lungs in exhaustion with sinking has already been mentioned; and there is no question that in protracted cases of this nature, the bronchia

* Trans. of a Soc. for the Imp. of Med. and Surg. Knowledge,
Vol. III, p. 315.

must become clogged and the arterialization of the blood impeded.

The state of flatulency, and the fœtid evacuations of the intestines, sufficiently denote the morbid condition of this internal organ.

There is also in extreme cases of exhaustion, a general tendency to serous effusion, both into the internal cavities and into the cellular membrane. This effect of the loss of blood has been very long remarked by medical writers.

As I have carefully avoided, in this Essay, the statement of any circumstance which I did not think amply substantiated by well-observed facts, I shall leave this part of my subject to be elucidated by future observation.

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THE subject of this Essay, like those of the two preceding ones, has, I think, been too much overlooked in medical writings. There are, however, some interesting observations by the late Mr. John Hunter,* and two invaluable papers by Sir Henry Hallford,† not irrelative to it, to which I shall have occasion repeatedly to refer in the course of the subsequent pages.

* See the "Treatise on Inflammation," Part II, Chap. IX, Sect. 3. "On Dissolution."

† Trans. of the Coll. of Phys., Vol. IV, p. 316; "On the Climacteric Disease;" and Vol. VI, p. 398, "On the Necessity of Caution in the estimation of symptoms in the last stages of some diseases."

I propose to consider the subject of exhaustion and sinking in relation 1. to *Early Infancy*, 2. to *Old Age*, 3. to *Several Diseases*, and 4. to *Certain Causes of Exhaustion*.

I. *Of Exhaustion in Early Infancy.*

The state of exhaustion is very apt to be induced in *early Infancy*; and as the reaction is feeble at this period of life, the case soon assumes the character of sinking. I have frequently been consulted when the original disease has been subdued, perhaps, and the chief complaint of the little sufferer was a state of exhaustion, which a truce from remedies and medicine and a proper supply of nourishment and perhaps stimulus have removed.

This state of things is often mistaken for inflammation of the brain or hydrocephalus. And it may be difficult to state the grounds for a just diagnosis between the two affections. It will, however, be of great assistance to be fully aware of the nature and character of exhaustion,—and to conjoin with this knowledge a due retrospect of the history of the case and a due consideration of the effects of the various remedies which may have been employed.

The stage of exhaustion in infants is little marked by the symptoms of reaction in the system described in the preceding essay. At first there are great restlessness, and irritability of temper, whilst the countenance is pale and expressive of great anxiety, and there is great frequency of the pulse; afterwards the temper and restlessness appear subdued, there are some dozing and other false and deceptive appearances of amendment, but the pulse is still more frequent, the face pale and sunk, and the cheeks and extremities are cold; the voice is apt to be husky and attended with a husky, hacking and distressing cough.

CASE I.

One little patient was reduced by too copious and repeated bleeding for croup. There supervened a state of irritability of temper, so that, when greatly exhausted, it made great efforts to bite, scratch, and beat its attendant. This state of agitation continued until the powers of life were gradually exhausted.

CASE II.

A little girl aged four months was seized with a bowel complaint; the usual medical attendant prescribed an aperient which acted too freely. When I saw it on the second or third

day of the disorder, the countenance was pale and sunk, and the cheeks cool; it started on being touched; there was a peculiar *huskiness* of the voice, and the pulse beat from 144 to 150.—By giving brandy the pulse was, on the succeeding day, reduced to 120, and there was some apparent amendment although a degree of rattling in the breathing or on coughing was now added to the huskiness of the voice.—By continuing the brandy the cheeks became warm and at length somewhat flushed, and the pulse rose to 140.—The quantity of brandy was now diminished and cautiously regulated, and the pulse very gradually lowered to the natural standard.

The condition of the cheeks in respect to colour and warmth may be almost regarded as the pulse of very young infants; in this case their pallidness and coldness, together with the state of the voice and breathing, indicated almost a fatal degree of exhaustion; the frequency of the pulse, arising from this cause, was reduced by the brandy; but it was afterwards again increased as the effect not of the exhaustion but of the stimulus, and the cheeks recovered their warmth and sometimes even became flushed.—In another case precisely similar, the state of sinking continued in spite of every remedy, and the little infant lingered and then expired. I

have known such a state of lingering to be continued for several days.

CASE III.

An infant two months old was taken with scarlatina; the bowels were affected with diarrhœa, and afterwards there were an aphthous state of the throat and frequent sickness with the diarrhœa; the rash was livid, disappeared imperfectly under pressure, and resembled the effects of exposure to cold on the extremities of young children. This infant went through the disease, but remained feeble for several days, and then gradually glided into the sinking state;—the cheeks became pale and cool, the hands cold, the eyes were dimmed by a film of mucus, the pulse and respiration became more and more feeble; a state of restlessness gradually subsided into dozing and death.

When a child has been rather long ill, when active remedies have been employed, when the form of the disease has perhaps changed in some degree, and paleness of the cheeks is attended with irritability and restlessness, we should carefully consider whether the symptoms are not those of exhaustion. I am persuaded that, by relinquishing all lowering remedies and adopt-

ing a cordial and soothing plan of treatment, I have seen some children recover who would soon have sunk under the continuance of remedies calculated to subdue a supposed state of inflammation within the head, chest, or abdomen. In these cases the idea that the original disease and the remedies had worn out the little patient and led to a state of exhaustion had apparently never occurred to the practitioner. It is impossible to do justice to this subject in a short section of a short essay; but I am persuaded that the *hints* here offered, will, if carefully considered and cautiously acted upon, be of great assistance to the young physician in his treatment of some of the diseases of infants.

II. *On Sinking in Old Age.*

The state of sinking is apt to come on in *old Age*, as it does in infancy, unattended and unpreceded by the symptoms of reaction. There are transient flushes of the cheeks and an increased frequency of the pulse; but the force of the arterial beat does not pass beyond that of health, but on the contrary becomes gradually more and more feeble.

Nothing can be more accurate than Sir Henry Hallford's description of this state.* He ob-

* Trans. of the Coll. of Phys. Vol. IV, pp. 318—320.

serves, " It sometimes comes on so gradually and insensibly, that the patient is hardly aware of its commencement. He perceives that he is sooner tired than usual, and that he is thinner than he was; but yet he has nothing material to complain of. In process of time his appetite becomes seriously impaired: his nights are sleepless, or if he get sleep, he is not refreshed by it. His face becomes visibly extenuated, or perhaps acquires a bloated look. His tongue is white, and he suspects that he has fever.

" If he ask advice, his pulse is found quicker than it should be, and he acknowledges that he has felt pains occasionally in his head and chest; and that his legs are disposed to swell; yet there is no deficiency in the quantity of his urine, nor any other sensible failure in the action of the abdominal viscera, excepting that the bowels are more sluggish than they used to be.

" Sometimes the headach is accompanied with vertigo; and sometimes severe rheumatic pains, as the patient believes them to be, are felt in various parts of the body, and in the limbs; but, on inquiry, these have not the ordinary seat, nor the common accompaniments of rheumatism, and seem rather to take the course of nerves than of the muscular fibres.

In the latter stages of this disease, the stomach seems to lose all its powers; the frame becomes more and more emaciated; the cellular membrane, in the lower limbs, is laden with fluid; there is an insurmountable restlessness by day, and a total want of sleep at night; the mind grows torpid and indifferent to what formerly interested it; and the patient sinks at last, seeming rather to cease to live, than to die of a mortal distemper."

The countenance besides being thinner and paler than before often betrays a peculiar imbecility both of the muscles and perhaps of the mind or feelings, by certain peculiar rapid movements observed in the chin and cheeks; a similar debility is observed both in the articulation and in the movements and manner in general; the feelings are, in some instances, very susceptible, and the patient is apt even to shed tears, and is unable perhaps to bear society; besides the head-ach and vertigo, there is sometimes a degree of fluttering in the region of the heart or stomach, and the pulse is apt to be irregular; the breathing is easily hurried by exertion or emotion; the patient is soon fatigued; there are wakefulness and restlessness with thirst and heat; the ends of the fingers are apt to become of a pale livid hue and cold; the muscular flesh wastes, and the patient is observed to be much "altered."

In this state of exhaustion I have several times known an attack very similar to *paralysis* to take place. In one patient the head fell down upon the chest, the muscles of the back of the neck becoming all at once affected with such debility as to be incapable of supporting it. From this debility the patient recovered gradually and was once more able to hold his head erect.— Another patient suddenly lost, in a great degree, the power of articulation and of deglutition. He recovered this power in a great measure, but soon passed into a fatal sinking state.

Such is the state of things before that of positive sinking begins, and from such a state the patient may recover; but in a short time, if recovery be delayed, that other change takes place and appears to lead irretrievably to dissolution.

With increased debility of the muscles and of the pulse, there is now slight delirium with a tendency to dozing; there is rattling in the throat and in the bronchia, with laborious and imperfect breathing; in some instances there is retention, with or without incontinence, of urine; the cheeks, hands, and feet become pale, livid, and cold, and the eye is covered with a film of mucus;—after some unusual effort, or, perhaps, just after the bowels have been moved, the patient

frequently expires rather suddenly;—otherwise there is the most gradual sinking of the powers of life, perhaps after several unexpected changes for better and worse.

CASE IV.

The Rev. —, aged 78, after having declined in the most gradual manner, became affected with cold and cough; in a few days it was apparent that he was passing into the sinking state,—the countenance became more emaciated and fallen, the cheeks cool, alternating with slight flushings, especially on giving any stimulus, the tongue became dry, there were wakefulness and restlessness, and afterwards dozing and snoring, some tendency to choaking on swallowing, and great rattling in the breathing; the pulse was frequent, the skin at first rather hot, the extremities afterwards losing their warmth. There were frequent unexpected changes for better and worse, and at last the fatal change took place rather suddenly after a too free evacuation of the bowels.

CASE V.

The Rev. —, aged 77, had been gradually declining for several years, when he was taken with apparent paralysis of the muscles of

speech and swallowing—the former was almost inarticulate, the latter attended by choaking and coughing; the cheeks and feet were frequently cool, at other times the countenance was flushed and the surface hot; at length the face sank, the pulse became feebler, and the breathing laborious and imperfect with much rattling from the accumulation of mucus;—the articulation and deglutition were, with the strength, at one time, much restored, and it appeared plain that these affections were the result of debility; afterwards they again became much impaired, and it was impossible to understand the patient, and the choaking on swallowing recurred; in one attack of coughing from this cause it really appeared that the patient would expire; he did recover, however, but, after having been stationary for several days, the state of sinking increased so rapidly that the injurious effects of the exertion was most obvious.—The mind remained clear; slight dozing came on; a film of mucus bedimmed the eyes; the rattling increased; the breathing became more and more imperfect, and the pulse feebler, until they gradually ceased altogether.

Sir Henry Hallford makes the following just remarks on the most usual causes of this state.—
“Of the various immediate causes to which this

malady may owe its commencement, there is none more frequent than a common cold. When the body is predisposed to this change, any occasion of feverish excitement, and a privation of rest at the same time, will readily induce it. I have known an act of intemperance, where intemperance was not habitual, the first apparent cause of it. A fall, which did not appear of consequence at the moment, and which would not have been so at any other time, has sometimes jarred the frame into this disordered action. A marriage contracted late in life has also afforded the first occasion to this change; but above all, anxiety of mind and sorrow have laid the surest foundation for the malady in its least remediable form."

III. *Of Sinking in Certain Diseases..*

Some diseases are apt to issue, even at a rather early period, in a state of sinking; in other cases sinking supervenes in the later stages of these diseases. This state seems sometimes to be the result of a direct influence of the disease in lowering the vital powers; sometimes the disease has subsided, but the state of sinking has continued and destroyed the patient; and sometimes the sinking has appeared to annihilate the morbid actions which constituted the disease, and

thus to prove a *cure*, though a fatal one. In the latter cases, the physician whose eye is fixed on the disease alone,—and the friends of the dying patient, are apt, from the apparent truce in the actions or pains of the disease, to be led into a sanguine though delusive hope that the patient is better;—there is perhaps a degree of dozing, mistaken for a long wished for sleep, or some painful symptom has subsided and the patient expresses himself as easier;—but there are some of the appearances or symptoms about to be described, which will not fail to undeceive the careful observer.

In treating of this subject I shall first make some extracts from the chapter on *Dissolution* by Mr. Hunter, and from the paper by Sir Henry Hallford, already alluded to, p. 71. The former of these contain a great deal of excellent remark in its author's usual singular style. The latter will be read with profit by every student of clinical medicine.—After having made these quotations, I propose to add some remarks which are deduced from my own experience.

“Dissolution is the last stage of all, and is common to, or an immediate consequence of all diseases, whether local or constitutional. A man shall not recover of a fever, whether original or

sympathetic, but shall move into the last stage, or dissolution. It shall take place in the second stage of a disease, where the state of constitution and parts appears to be formed out of the first; as for instance, a man shall lose his leg, especially if above the knee; or have a very bad compound fracture in the leg; the first constitutional symptoms shall have been violent, but all shall appear to have been got the better of, and there shall be hopes of recovery, when suddenly he shall be attacked with a shivering fit, which shall not perform all its actions, viz. shall not produce the hot fit and sweat, but shall continue a kind of irregular hot fit, attended with loss of appetite, quick, low pulse, eyes sunk, and the person shall die in a few days.

“The first symptoms are generally those of the stomach, which produce shivering: vomiting immediately follows, if not an immediate attendant; there is great oppression and anxiety, the persons conceiving they must die. There is a small quick pulse; perhaps bleeding from the whole surface of the sore, often mortification, with every sign of dissolution in the countenance; as it arises with the symptoms of death, its termination is pretty quick. Here is a very fatal disease taking place; in some almost immediately, when all appeared to be within the

power of the machine, and therefore cannot immediately arise from the sore itself; for it is very common after such operations as usually do well; but the hectic always takes place in consequence of those sores which seldom or never get well in any case; yet the sore certainly assists in bringing on dissolution, because we never see the disease take place when the sore is healed, nor in those where the constitution seems not to be equal to the task, as is the cause of the hectic.

“ Death or dissolution, appears not to be going on equally fast in every vital part; for we shall have many people very near their termination, yet some vital actions shall be good, and tolerably strong; and if it is a visible action, and life depends much upon this action, the patients shall not appear to be so near their end as they really are: thus I have seen dying people whose pulse was full and strong as usual, on the day previous to their death, but it has sunk almost at once, and then become extremely quick, with a thrill: on such occasions it shall rise again, making a strong effort, and after a short time, a moisture shall probably come on the skin, which shall in this state of pulse be warm; but upon the sinking of the pulse, shall become cold and clammy: breathing shall become very imperfect,

almost like short catchings, and the person shall soon die.

“ It would appear in many cases, that disease has produced such weakness at last, as to destroy itself: we shall even see the symptoms, or consequences of disease, get well before death.

“ Even when in the state of approaching death, we often find a soft, quiet, and regular pulse, having not the least degree of irritability in it, and this when there is every other sign of approaching death; such as entire loss of appetite, no rest, hickup, the feet cold, and partial cold, clammy sweats, etc.”*

“ It often happens at the latter end of some diseases, both of an acute and a chronic nature, that appearances present themselves of a very equivocal and delusive nature; with which the issue of the malady does not correspond. This is most frequently the case when the resistance of the constitution against the influence of the disease has been long protracted, or when the struggle, though short, has been very violent. Here, a pause in nature, as it were, seems to

* Hunter on Inflammation, pp. 504, 506, 507, 508.

take place; the disease "has done its worst," all strong action has ceased, the frame is fatigued by its efforts to sustain itself, and a general tranquillity pervades the whole system. This condition of comparative ease, the eager wishes of friends misconstrue into the commencement of recovery, and the more readily so, as the patient himself being appealed to, to confirm their anxious hopes, having lost some of his sufferings, admits, perhaps, that he is better.

"I have seen this fallacious truce in four or five instances of inflammation of the brain, particularly where the membranes which cover it have been inflamed, producing phrenzy.

"In inflammation of the bowels generally it is so notorious, that mortification often follows a cessation of pain, that I do not think it necessary to dwell upon this form of disease with a view of cautioning physicians; but in that partial inflammation of the intestines which a strangulation of a portion of it in hernia produces, how often have I had occasion to deplore the disappointment and broken hopes of relatives, who, having been made happy by the assurance of the surgeon that he had reduced the protruded bowel, and that now all would be well, in only a few hours afterwards were doomed to lament the

patient's death! It is an invariable rule with me still to consider life as in jeopardy, until the intestines shall have performed their functions again, all irritation having left the stomach, and the skin remaining universally and equally warm.

“The confluent small pox, requires a very guarded prognosis at a certain stage of it. The physician may fairly acquiesce in the fears of a family, when on the completion of the eruption, he sees the face and breast one mass of disease, and may most reasonably doubt the capability of the constitution to maturate and perfect so large an eruption. But he must not hold out unfounded hopes to the parents if the malady proceed in the next stage, in a most satisfactory manner, beyond his expectations. The pustules ripening fully, and the process being complete—for alas! at this very moment it may be, the patient is sinking—is dead! the powers of his constitution being exhausted by the efforts it has made, and no longer equal to the accomplishment of a protracted cure.”*

The diseases in which the state of sinking is most marked are, I think, Typhus Fever and

* Trans. of the Coll. of Phys. Vol. VI, pp. 400—405, 408.

Enteritis,—Dysentery,—or Cholera,—though many other diseases lead to this state, and especially some which consist in repeated attacks, each attack leaving the patient weaker than before, until they issue in sinking of the vital powers.

Amongst the first symptoms, coldness and lividity of the hands are frequently observed,—the livid colour disappearing imperfectly on pressure; the cheeks and nose are at the same time usually cool. There are often much general and indefinable suffering, distress, and restlessness; sometimes slight dozing, at others, slight delirium, and in some cases convulsion followed by coma; the breathing is sometimes imperfect, at others little affected, and I have in some cases observed the crepitus in breathing, of which I have spoken in the preceding essay, for some days even before there was any other decided symptom of sinking; the voice is frequently altered and rather husky; the pulse is small and frequent, and perhaps irregular; the motions are apt to be passed involuntarily, and sometimes there is retention of urine:—it is usual for some distressing symptom, as delirium in phrenitis, cough in affections of the chest, and pains in those of the abdomen, to have ceased as the state of sinking has come on.

The state of sinking has not, I am persuaded, been distinguished from those forms of disease which have lately been more particularly attended to and denominated *congestive*; yet the diagnosis is of the utmost moment; for under the idea of congestion, the lancet has sometimes been used when stimuli were required to obviate a state of exhaustion or sinking.

In Typhus sinking is very apt to occur in the later stages. In some diseases of the bowels, this state sometimes occurs even early in the disease; in some such cases it has been usual to conclude that gangrene had taken place, but on examination no such appearance has been observed; the sinking state is equally with gangrene attended by a subsidence of the abdominal pains.*—In one case of *suppression* of urine the secretion was somewhat restored in the last stage, or sinking state.

In the more chronic cases leading to sinking there are various slight efforts of reaction,—as flushes, and heat of skin; sometimes there is shivering followed by heat; slight dozing, or delirium, crepitus or labour in breathing, catching or mucus cough, cold extremities, the eye being bedimmed by a film of mucus.

* See further the "Essay on Symptoms," p. 77.

CASE VI.

Woodborough, aged 20, was taken, after having been engaged in churning in a damp kitchen, with all the symptoms of *enteritis*; the bowels were obstructed and affected with great pain and tenderness;—the pulse was 120 and rather small; the hands were kept out of bed, and their surface was livid, cold, and damp, the livid colour disappearing very imperfectly on pressure. In spite of every remedy, to subdue the disease and to support the warmth of the body,—especially the freest bloodletting and eventually the spiritus terebinthinæ, the state of coldness and sinking continued and increased, and the patient died within fifty hours of the first attack.—An examination was refused.

Similar cases must have occurred to every physician of experience. There is a puerperal affection of the bowels, the course of which is similar. In two instances, there were very severe attacks of pain; the surface became cold and livid, the voice changed, the breathing imperfect, the pulse frequent and small, and the patients expired with all the symptoms of sinking.—On examination there were no morbid appearances whatever. I intend to publish a fuller account of these cases at some future period.

CASE VII.

Miss Walmsley, aged 29, was seized with all the symptoms of Dysentery, which were greatly subdued by bleeding, calomel, and opium;—but in a short period from the attack, coldness and lividity of the hands came on, with moaning and restlessness, and a small pulse of 120, and gradually increased until the patient died.

CASE VIII.

Mr. ——— aged about 30, was affected with complicated disease within the thorax,—viz. tubercles, and a contracted state of the chest from the effusion and subsequent absorption of serum. In the latter period of the disease, the cough and expectoration had almost ceased, the pulse remaining very frequent. In this state he walked and rode out when it was plain that the effort kept up the frequency of the pulse and increased the exhaustion of the patient.—He became more feverish with suffusion of the countenance and of the eyes; slight delirium came on with playing with the fingers as on a piano-forte,—restlessness and wakefulness.—In a few days afterwards a convulsive struggle took place,—recurred several times, and was succeeded by coma. The eyes now became covered with a film of mucus, there were rattling and labour in the breathing, and

retention and involuntary flow of urine; the extremities became cold and the patient gradually sank.

CASE IX.

The Rev. —, aged 40, was affected with *Icterus and reiterated attacks of pain in the region of the stomach; these attacks, together with the remedies necessary to relieve them, gradually reduced the patient to extreme weakness and great emaciation. In this state he went to Leamington, and was apparently benefitted by a course of the blue pill.—At this period, feeling himself better than usual, he rose early one morning, dressed himself, and went down stairs, with the intention of agreeably surprising his friends. He was overcome by the effort, however, and became faint; he was then taken with chilliness; he was removed to bed, and became slightly feverish.—On the succeeding morning there was rigor followed by great heat of skin, and a sense of tightness under the sternum.—On the next day there were slighter rigor,—less heat,—a degree of delirium,—and then constant dozing;—in this state of dozing he continued for some hours,—no danger having been intimated by the physician in the morning, or felt by his friends during this sleep, from which they expected to see him awake refreshed. In the evening when the

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physician arrived, the pulse could scarcely be felt, and the vital functions shortly afterwards ceased altogether.

The following extracts from the celebrated work of M. Laënnec seem to have a reference to this state of sinking as occurring in some cases of pneumonia.

“ Chez d'autres sujets, au contraire, la péripneumonie détermine la mort avant que l'engorgement ait envahi le quart de l'organe pulmonaire. Ce fait est propre, ainsi que beaucoup d'autres, à prouver que, dans les altérations de nos organes, la mort est souvent due à l'affaiblissement du principe de la vie beaucoup plus qu'à l'intensité ou à l'étendue de l'affection locale.” § 201.

“ On ne voit que trop souvent des exemples de péripneumonies qui, après l'emploi de la saignée et des anti-phlogistiques, paraissent au bout de quelques jours à-peu-près guéries, si l'on s'en rapportait aux symptômes extérieurs: la fièvre a cessé, la douleur n'existe plus, la toux devient rare et peu pénible, l'expectoration est médiocre, les forces renaissent, l'appétit reparaît et devient quelquefois même très-vif, et cependant l'engorgement pulmonaire n'a nullement diminué:

la percussion donne un son mat, le cylindre ne fait rien entendre. Au bout de quelques jours, et même de quelques semaines d'une fausse convalescence, les forces tombent de nouveau, et, suivant l'âge du malade, un nouvel appareil inflammatoire ou une dyspnée accompagnée d'affaissement et de symptômes de congestion cérébrale sont promptement suivis de la mort." § 212.

Sinking is sometimes induced by a too active depletory mode of treatment; at other times it is the peculiar tendency or effect of the disease. Altogether I regard this subject as of peculiar interest,—very imperfectly known,—and still requiring the most attentive investigation. I have here only pretended to offer hints and some materials for thinking, leaving the matter for future inquiry.

IV. *Of Certain Causes of Exhaustion.*

The causes of exhaustion to which I intend to allude slightly, in this place, are chiefly—too protracted *lactation*,—and profuse *leucorrhœa*. These two causes of exhaustion produce nearly similar effects,—and the former frequently induces the latter. It will only be necessary, therefore, to give the usual symptoms of exhaustion in the case of protracted lactation.

The countenance becomes pale and thin, and there is a general loss of flesh and strength, with great susceptibility to the effects of bodily exertion or mental emotion; there are headach, and frequently a sense of beating,—or of pressure; there are usually fluttering and palpitation of the heart, alternating with faintishness; breathlessness and cough, and feebleness or hoarseness of the voice; and the stomach and bowels become greatly disordered—flatulent and constipated, and incapable of performing the functions of digestion.—The cough is sometimes attended with expectoration and such emaciation as to lead to the apprehension of a particular kind of *consumption* of which I purpose to publish an account hereafter.—Every thing denotes a diminished energy of the vital powers.

FINIS.