Observations on the life, disease, and death of John Hunter, in elucidation of the nature and treatment of gout and angina pectoris, being the oration delivered before the Hunterian Society, at its thirty-sixth anniversary / by Joseph Ridge, M.D.

OBSERVATIONS

ON

THE LIFE, DISEASE, AND DEATH

OF

JOHN HUNTER,

IN ELUCIDATION OF THE NATURE AND TREATMENT

OF

GOUT AND ANGINA PECTORIS,

BEING THE ORATION DELIVERED BEFORE THE

HUNTERIAN SOCIETY,

AT ITS THIRTY-SIXTH ANNIVERSARY,

BY

JOSEPH RIDGE, M.D.,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS,

ETC. ETC.

LONDON:

JOHN CHURCHILL, NEW BURLINGTON STREET.

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MDCCCLV.

HUNTERIAN ORATION.

ON GOUT AND HEART-DISEASES.

MR. PRESIDENT AND GENTLEMEN—

WHEN the Council did me the honour to request that I would deliver the Oration for the present year, it was less difficult for me to conclude that I should not avoid the task, than to select an appropriate subject; and in the midst of other occupations and anxieties which fall to our share, to treat it in a manner that might be deemed worthy of the audience which usually assembles here.

Reflecting particularly on the deserved extent to which all the more general and characteristic topics relating to the illustrious man after whom our Society is called, have been laid before the Profession and the public, the field of selection seemed so narrow, that I could appreciate the motives of those of my predecessors in this duty, who, on grounds of novelty and utility, have addressed you on points of medical inquiry not immediately connected with the name of HUNTER. Desirous, however, on my own part, to retain the ennobling and endearing link, and mindful of the defective way in which the important records of his fearful disease and sudden death, that should bind us yet more closely to his memory, have been commented on, I hoped that a more correct exposition of their causes would be acceptable to you, and might possibly lead to a judicious and useful embodiment of this melancholy part of his life, with its general history, by the future biographer.

That museum which affords the best impress of his mind, and is the fitly-cherished monument of his praise, could not have contained a preparation in all respects so valuable as a relic, the agonizing attacks connected with which he endured

with a rare fortitude; and those only who are best acquainted with the untiring efforts by which, under augmenting sufferings and dangers, he strove to the last hour of life to make his wide and comprehensive labours culminate in the practical objects for which we are associated, can properly understand the zeal with which he used always, in the strongest language, to express his condemnation of those who should neglect to examine his body and preserve his heart.

Sir Everard Home has not fulfilled the latter part of this request, but, without any verbal alteration, has appended to the brief memoir of his life that precedes the treatise on the blood, inflammation, and gunshot wounds, the notes written by Hunter himself during his illnesses, together with those he dictated to him when unable to do so. By the aid of these, and the description of the morbid appearances, though in many respects imperfect, and by viewing them through the light of other cases and dissections which have long since afforded me satisfactory evidence of its true nature, I shall be enabled, I trust, to elucidate the Pathology of Angina Pectoris, and the principles of its treatment. An opportunity will, at the same time, be afforded of explaining to some extent its occasional association with Gout, the most alarming attacks of this disease, and their management.

For such objects, I shall so far reverse the natural order of events, as to relate, first, the circumstances attending his death, and the appearances displayed by the post-mortem inspection; and subsequently trace the production of morbid phenomena as far back as possible, diverting you from all the instructive details of his extensive and varied researches to their influence on his own organization, and deducing lessons that may in part come nearest home to ourselves.

"Forsan et hæc olim meminisse juvabit."

I will not enter into more of the account of those unhappy

quarrels at St. George's, which terminated tragically the life of Hunter, than is necessary to display the congestive effects of excitement, and the operation, if not of fear, too well grounded, and its muscular relaxations, at least of emotional shock, in diminishing the contractions of the heart and other forces; including, apparently, those influences which maintain the spontaneous coagulability of the blood out of its vessels, and after death, though there is reason to believe this fluid had become much altered in its constitution and properties.

"On the 16th of October," says Mr. Ottley, I need scarcely add of the year 1793, "the Board was to meet; and Hunter prepared to fulfil his promise, though he was so well aware of the risk he incurred in undertaking a task which he felt would agitate him, that in mentioning the circumstance to a friend who called on him in the morning, he expressed his apprehension lest some unpleasant dispute might occur, and his conviction, that if it did it would certainly prove fatal to him.

At his accustomed hour he left his house to commence his morning rounds, and by accident forgot to take with him his list of appointments. He had left the house but a few moments when it was discovered, and Mr. Clift, who was then residing in his house, hastened with it to York Street, St. James's, the first place on the list, where he found the carriage waiting. Hunter soon made his appearance, took the list, and in an animated tone called to the coachman to drive to St. George's. Arrived at the hospital, he found the Board already assembled, and, entering the room, presented the memorial of the young men, and proceeded to urge the propriety of their being admitted. In the course of his remarks he made some observation which one of his colleagues thought it necessary instantly and flatly to contradict. Hunter immediately ceased speaking, retired from the table, and, struggling to suppress the tumult of his passion, hurried into the adjoining room, which he had scarcely reached, when, with a deep groan, he fell lifeless

into the arms of Dr. Robertson, one of the physicians of the hospital, who chanced to be present. Dr. Baillie had immediately followed him from the Board-room, and Mr. Home, who was in the house, was also summoned to his assistance. Various attempts were made, for upwards of an hour, to restore animation, under the hope that the attack might prove to be a fainting fit, such as he had before experienced, but in vain: life had fled; and all their efforts proving useless, his body was placed in a sedan-chair, and conveyed to Leicester Square, followed by his now vacant carriage."

Let me invite your close attention to the particulars of the autopsy, as they will be objects of reference throughout these remarks, begging you to distinguish the effects of Necræmia from the cadaveric results of fluidity of the blood, and these from its delay in the veins, whilst the heart, aided by the contractility of arteries, and the capillary forces, emptied itself and collapsed; and thus a greater paleness of it was produced in death than existed in life, except to an approximative extent under previous attacks, whatever organic changes its muscular structure may have undergone. "The skin in several places was mottled, particularly on the sides and neck, which arose from the blood not having been completely coagulated, but remaining nearly fluid. The contents of the abdomen were in a natural state, but the coats of the stomach and intestines were unusually loaded with blood, giving them a fleshy appearance, and a dark reddish colour: those parts which had a depending situation, as in the bottom of the pelvis, and upon the loins, had this in a greater degree than the others: this evidently arose from the fluid state of the blood. The stomach was rather relaxed, but the internal surface was entirely free from any appearance of disease; the orifice at the pylorus was uncommonly open. The gall-bladder contained five or six small stones of a light yellow colour. The liver and the other viscera exhibited nothing unusual in their

appearance. The cartilages of the ribs had in many places become bone, requiring a saw to divide them. There was no water in the cavity of the chest, and the lungs of the right side were uncommonly healthy; but those of the left had very strong adhesions to the pleura, extending over a considerable surface, more especially towards the sternum. The pericardium was very unusually thickened, which did not allow it to collapse upon being opened: the quantity of water contained in it was scarcely more than is frequently met with, although it might probably exceed that which occurs in the most healthy state of these parts. The heart itself was very small, appearing too little for the cavity in which it lay, and did not give the idea of its being the effect of an unusual degree of contraction, but more of its having shrunk in its size. Upon the under surface of the left auricle and ventricle, there were two spaces nearly an inch and a half square, which were of a white colour, with an opaque appearance, and entirely distinct from the general surface of the heart: these two spaces were covered by an exudation of coagulating lymph, which at some former period had been the result of inflammation there. The muscular structure of the heart was paler and looser in its texture than the other muscles in the body. There were no coagula in any of its cavities. The coronary arteries had their branches which ramify through the substance of the heart in the state of bony tubes, which were with difficulty divided by the knife, and their transverse sections did not collapse, but remained open. The valvulæ mitrales, where they came off from the lower edge of the auricle, were in many places ossified, forming an imperfectly bony margin of different thicknesses, and in one spot so thick as to form a knob; but these ossifications were not continued down upon the valve towards the chordæ tendineæ. The semilunar valves of the aorta had lost their natural pliancy, the previous stage to becoming bone; and in several spots there were

evident ossifications. The aorta immediately beyond the semi-lunar valves had its cavity larger than usual, putting on the appearance of an incipient aneurism: this unusual dilatation extended for some way along the ascending aorta, but did not reach so far as the common trunk of the axillary and carotid artery. The increase of capacity of the artery might be about one-third of its natural area; and the internal membrane of this part had lost entirely the natural polish, and was studded over with opaque white spots, raised higher than the general surface. On inspecting the head, the cranium and dura mater were found in a natural state. The pia mater had the vessels upon the surface of the two hemispheres of the brain turgid with blood, which is commonly found to be the case after sudden death. The internal structure of the brain was very carefully examined, and the different parts both of the cerebrum and cerebellum were found in the most natural and healthy state; but the internal carotid arteries, as they pass by the sides of the sella tursica, were ossified, and several of the ramifications which go off from them had become opaque and unhealthy in their appearance. The vertebral arteries, lying upon the medulla oblongata, had also become bony, and the basillary artery, which is formed by them, had opaque white spots very generally along its coats."

Such is a characteristic anatomical expression of Angina in its worst form, and such the danger of a fatal termination from its origin, when the causes of the heart's weakness remain, or are repeated, and especially after atrophy or fixed degenerations of its muscular structure at both sides have advanced and become complicated with further cardiac and other changes.

Under these circumstances the most sudden death takes place without the pains or anguish of what is described as the paroxysm, and from a state of emptyness more or less complete of its cavities. The enfeebled organ cannot impart its

normal impulse to the column of blood; and upon some general depression, or mechanical impediment to its return in completion either of the systemic or pulmonic circuit, the stream is arrested at its extreme parts, and may leave remnants only at a considerable distance from one or both auricles. If, in Hunter's case, the brain could have received sufficient arterial blood for moral to have given rise to physical reaction, and anger could have once more excited the remaining force of the heart, with that of other muscles, blood might again have been hastened to its cavities in larger quantity than could be forwarded through constricted arteries, and have produced a painful attack, such as he was now frequently experiencing on the slightest occasions of an additional access of blood to, or of an obstructed exit from them, with or without the most alarming syncope. This reverse condition of accumulation of blood at the central organ and great vessels was correctly asserted by Parry to be the proximate cause of the paroxysm thence called by him Syncope Anginosa; but in proposing these terms for the general disorder, he excluded from the inquiry, and from his own recapitulation, the most important phenomena of that diminished energy of the heart, which, with Jenner, he referred exclusively to mal-organization of its coronary arteries, to use words employed by those excellent pathologists.

Yet it is remarkable that the first case published by himself, at the inspection of which the immortal philanthropist was present, as well as the records before us of that preceptor whom he styled always "the dear man," presented the facts that might have revealed the explanation.

In the account of Mr. Bellamy's case, Mr. Paytherus says, "His spirits did not even to the last desert him. He had seen a party of his friends on the evening of his death, with whom he had conversed cheerfully. He retired at his usual hour, had undressed himself, and, in the act of sitting upon the side

of the bed, gently slipped down, and instantly expired." After describing the fibrinous cast within the coronaries, in a history where, in contrast with Hunter's, I may say, no mention of Gout appears, he adds, "In the ventricles and auricles there was no blood. The whole had the appearance of having been repeatedly washed in water." So is it with other phenomena of the body, of disease, and of the universe. They lie frequently, as it were, under our eyes, and need only patient observation and thought to be reduced to the clear demonstrations of Science.

Although Heberden, in his original notice of the disorder, applied the term Angina, from the sense of strangling as well as the anxiety and pain, he recognised the purely syncopal seizures at an advanced stage, to which they are not confined.

In the seventieth chapter of his admirable Commentaries, headed "Pectoris dolor," he observes distinctly, "The termination of the Angina Pectoris is remarkable; for if no accident intervene, but the disease go on to its height, the patients all suddenly fall down and perish almost immediately, of which, indeed, their frequent faintnesses, and sensations as if all the powers of life were failing, afford no obscure intimation." The name was ill chosen, and inappropriately applied, by both writers, not only from an absence of the conditions and feeling of suffocation in these Leipothymic seizures, which in their varied manifestations are often attended by a diminution or cessation of breathing, or by peculiar states and derangements of it without any impediment to the admission of air, but from the derivation of the term referring to, and its solitary use also to designate, obstructions to respiration at the throat, where no allied concomitant phenomena exist, and when all difficulty of breathing, or dyspnœa, prevented by an equal or greater loss of power on the right side of the heart, which cannot largely inject the lungs, was excluded from the essential symptoms. Its pectoral appellative limited the affection to the chest, while

the pains in the arms were accurately described by the illustrious Heberden; and I wish to show that its signs and results extend as remarkably to the abdomen, and the head, and, indeed, to every organ and part of the body. Their reference to spasm by the same great physician, by Home in these notes, and more recently by Latham, is yet more objectionable as obscure, exclusive, and conjectural. The amount of truth conveyed by any definition of spasm or of cramp applicable to Angina is included in a generalization of defective contraction that has not always its origin in the heart itself, but is the pathological condition of all the phenomena of the disease. Beyond this proposition—on which I have long insisted—we may never be able to proceed to each primary cause of weakness that should be the object of diagnosis, and, as far as possible, of removal or of mitigation; and we ought to regard in a similar manner other hypotheses that have been put forth without the legitimate basis of a single observation.

The reciprocal and combined agencies of the nervous system, of the blood, and of contractile fibre, in their multiform gradations and evanescent character, cannot be unravelled for the explanation of many incipient and transitory forms of disease, starting from different points in the round of physiological dependencies.

Speaking as widely as the sources and effects of the attacks warrant, we must consider fully the extent to which molecular changes that create and modify the forces of the body, regarded as an unity as well as in its separate parts or functions, surpass the elucidations of the microscope and of chemistry, and of the entire circle of the Physical Sciences, and admit only an induction of ultimate facts, and of reasoning not less demonstrative based upon them. As, then, we should not deny that the heart may be paralyzed by distention in the first or any subsequent paroxysm, without displaying a perceptible organic cause of weakness or of obstruction, so must we allow that it

may more or less suddenly cease to beat from a defective return of blood to any of its cavities, and exhibit only the paleness and looseness of muscular structure deprived of the vivifying fluid which, in conjunction with the nervous supply, permanently sustains its properties.

The first distinct notice of this treacherous form of syncope and death was taken by Chevalier, and published in the first volume of the Medico-Chirurgical Transactions, under the title of "Asphyxia Idiopathica," the failure of action referrible in many cases chiefly to a defective vis a tergo being attributed to the distal vessels, although such loss of capillary and venous power, and many other causes of a diminished flow towards either auricle, exist, besides those enfeebling more directly the ventricular contractions.

In infants and children, fainting fits, and suspensions of breathing which probably relate to Hunter's immediately ceasing to speak, are more common, from a disproportionate size of the liver contributing to portal, and through varying effects of compression and of abdominal fullness to a more diffused vasular obstruction; from distensions of the stomach and bowels, and quick accessions to the volume of blood by the rapidity of digestion; from a heart naturally more feeble with the muscular system in general and other forces; from a greater mobility of the nervous system, and a more ready exhaustion of its agencies; from a tendency to reflex spasm and other laryngeal obstructions; and above all, from the dimensions of the thymus gland, which, under congestion, hypertrophy, and other states of enlargement, presses upon the veins which form the superior cava, and robs the right side of the heart of the blood that should be returned from the head. These, and other peculiarities, affecting infancy especially, render cerebral attacks and complications, and impairments of respiration by convulsions and sopor, approaching to coma, with or without effusion, more frequent in children than in

adults, in whom the abdominal organs, and the stomach in particular, display prevailing disturbance, as at and subsequent to the first seizure of this kind to which Hunter was exposed.

At any time, and often with little manifest warning, the thread of life may be snapped in an instant, and the heart of the little patient is left partially or completely empty, and sometimes similarly shrunken or puckered up. Such disorders of the circulation have been termed by the Germans, Thymic Asthma. You will find various and mixed cases on record, with remarks more or less judicious, by Drs. Kopp and Hirsch of Königsberg, Mr. Hood of Kilmarnock, and Dr. Montgomery of Dublin.

The uniformity and simplicity of organic as of inorganic laws (I might proceed to nature as a whole, and the necessity of taking the widest possible view of healthy and of morbid action, and of their universal relations) are exemplified by the occurrence of sudden death in this way, under accidents, poisons, disease, and remedies, in all states of anæmia, asthemia, and cachexia, in puerperal and suckling women, in the old as well as in the young, after depletions of any kind, or where insufficient nutritive supplies have withdrawn the stimulus of adequate fullness, when we may find only scanty and soft clots in particular cavities of the heart, or a small quantity of fluid blood, or concretions, which, from their firmness, adhesions, and other peculiarities, lead us to believe that separations of fibrin had occurred for some time before the last flickerings of a feeble heart, whose failure they had hastened.

With the mind and hand of a master, Harvey has anticipated to great extent the twofold character of Angina, and its opposite modes of death, to which all others are reducible at one or both sides of the heart, by a prophetic and experimental summary of the circulation contained in the tenth chapter of that renowned anatomical disquisition on the motion of the heart and blood in animals, whose study, with that of the

Disquisitions to Riolan, might have sooner led to a clear apprehension of its nature, and of fundamental principles in Pathology and Therapeutics.

Before tracing what may be considered hereditary tendencies to this anæmia and hyperæmia of the heart, involving its tissues as well as its cavities, and the results, functional and organic, of venous and of arterial retardation, the interests of Science itself require that I should lay prominently before you two causes which prevailed over all others in the production of Hunter's complaints. I allude to ill-regulated intellectual labour and insufficient sleep. Extremes meet in the contemplation of the early and subsequent portions of his life, its middle third being attended by efforts so vast and indefatigable as to unfit him in a medical point of view for the public exertions of the remaining twenty years. Four hours rest at night and one after dinner cannot be deemed sufficient to recruit the exhausted powers of body and mind.

That I may not check unduly the exertions of the intellect by which you live, and that devotion to the scholar's office by which you take the strongest hold of the best affections and interests of mankind, I will give you the needful warnings and injunctions, as far as they can be imparted, or are capable of rules, in the language of one of the brightest ornaments of our country, who, abstaining from an open profession of medicine, and subject to attacks of asthma, or in plain words, used by himself, that avoid vexated questions, shortness of breath, gave an impetus to the highest departments of philosophic inquiry that must revert to their physiological source, and may be said to have prolonged his life and faculties, by his unequalled skill and judgment, to a term not otherwise to be expected, and in his own opinion by usually drinking nothing but water, though of so weak a constitution, and who might well declare at its close that it had been happy when productive to the last of so much good.

I shall premise also, as closely related to my purport, a portion of his own just epitaph, that, recognising the object, you may be reminded of the grounds on which to limit mere literary pursuits, be content with the recompense that attends your beneficent labours, be confirmed in the love of that independence, tranquillity, and peace, which constitute the great source of comfort and of health, the best safeguard of integrity, and a constant security against all diversion, by the golden apples cast before Atalanta, from our straight course of victory over nature, as far as may be permitted.

> "Si qualis fuerit rogas, mediocritate suâ contentum se vixisse respondet.
> Literis innutritus, eōusque tantum profecit, ut veritati unicè litaret."

The sanction and advice of Locke, sought and boasted of by the best judges of their value, may rightly serve to direct our attention to the injurious effects on the stomach and the brain, and I may add, the heart, of the causes referred to. They interfere, in an especial manner, with the digestive, assimilative, and excretory functions; and we thus find the gouty diathesis developed, though far from exclusively, in men of deep and original thought, who cultivate their minds to the best purpose, and accomplish the greatest objects; and amongst whom Harvey, and Sydenham, and the two Hunters, appear as prominent examples. His observations testify that he concurred, not only in the reform of the treatment of fevers effected by Sydenham, and in that method of the English Hippocrates by which, when Science or a knowledge of causes is deficient, we derive indications directly from nature, the results of experience, and the dictates of common sense, but also in the ancient doctrine of Blood-diseases, arising from the generation and retention of deleterious matter within the body, the elimination of which, combined with the gentle relief of congested organs, and the maintenance or promotion of power,

I may here refer to as curative and palliative principles, requiring the largest application to the disorders under consideration, through remedial agents on which, and on chemical branches of the inquiry, I need not enlarge. Amid the wise remarks in the posthumous Essay on Study, published by Lord King in his valuable life and correspondence of this great man, the eminently practical philosopher writes—"Our happiness being thus parcelled out, and being in every part of it very large, it is certain we should set ourselves on work without ceasing, did not both the parts we are made up of bid us hold. Our bodies and our minds are neither of them capable of continual study; and if we take not a just measure of our strength, in endeavouring to do a great deal, we shall do nothing at all.

"The knowledge we acquire in this world, I am apt to think, extends not beyond the limits of this life. The beatific vision of the other life needs not the help of this dim twilight; but be that as it will, I am sure the principal end why we are to get knowledge here, is to make use of it for the benefit of ourselves and others in this world; but if by gaining it we destroy our health, we labour for a thing that will be useless in our hands; and if, by harassing our bodies, though with a design to render ourselves more useful, we deprive ourselves of the abilities and opportunities of doing that good we might have done with a meaner talent, which God thought sufficient for us by having denied us the strength to improve it to that pitch which men of stronger constitutions can attain to, we rob God of so much service, and our neighbour of all that help, which, in a state of health, with moderate knowledge, we might have been able to perform. He that sinks his vessel by overloading it, though it be with gold and silver and precious stones, will give his owner but an ill account of his voyage. It being past doubt then, that allowance is to be made for the temper and strength of our bodies, and that our health is to regulate the measure of our studies, the great secret is to find out the pro-

portion; the difficulty whereof lies in this, that it must not only be varied according to the constitution and strength of every individual man, but it must also change with the temper, vigour, and circumstances, and health of every particular man, in the different varieties of health, or indisposition of body, which every thing our bodies have any commerce with is able to alter: so that it is as hard to say how many hours a day a man shall study constantly, as to say how much meat he shall eat every day, wherein his own prudence, governed by the present circumstances, can only judge.—Great care is to be taken that our studies encroach not upon our sleep. This I am sure, sleep is the great balsam of life and restorative of nature, and studious sedentary men have more need of it than the active and laborious, because those men's business and their bodily labours, though they waste their spirits, help transpiration, and carry away their excrements, which are the foundation of diseases; whereas the studious sedentary man, employing his spirits within, equally or more wastes them than the other, but without the benefit of transpiration, allowing the matter of disease insensibly to accumulate. We are to lay by our books and meditations when we find either our heads or stomachs indisposed upon any occasion; study at such time doing great harm to the body, and very little good to the mind."

But organic causes in operation before Hunter's existence exposed it additionally to internal and external morbific agencies. Procreated when his father was numbering nearly seventy years, he appears to have received a distinct impress of his decay and infirmities, and to have retained in the composition and mature development of the impregnated vesicle, or germ-cell, and its affinities, the elements, if not the virus, of a specific disease, which stamped the seal of death on his meridian by peculiar elective textural changes, and by successive disturbance and deposition promoted his dissolution at sixty-

five years of age, that at which Dr. William Hunter had previously died.

In his own family the early probabilities of life were against him from birth. Five of the nine brothers and sisters who preceded him died in childhood, from causes referrible, as we may suspect, to that wide-spread, variously manifested, and often long concealed calamity, a feebleness of organization.

In a letter seen and partly published by Dr. Samuel Fouart Simmons in his account of the life and writings of Dr. Hunter, the patriarch writes to his son William, three months before his death, which happened when he was seventy-eight years of age, and when John was ten years old—

"I surely must soon expect to be beyond this side of time, considering my age and present indisposition, being for some days past confined to my bed with sickness and a severe fit of the gravel, and would be glad to have you near me for the little while I shall be in this world; though, at the same time, I should be sorry to hinder you from making your way in the world the best way you can."

We know not, so far as I can discover, whether the Hunters of Hunterstown were liable to Gout, or that its pathognomonic concretions existed in any of those parts and structures of the aged parent that are in general their chosen seat. But without demonstrations of urate of soda in the tissues, or of the existence of uric acid in abnormal quantities in the blood and serous fluids, as recently effected by Dr. Garrod through his "thread experiment," we may consider the marked inheritance of the stomach and urinary disorders, with the history of the offspring, as affording an illustrative instance of the genesis of Gout by senile conditions, and of its worst inflictions, after the escape of greater dangers. Regarding the latter, the efficiency and paramount importance of physical education could not perhaps be better exemplified.

To the fondness of a widowed and indulgent mother Hunter was indebted for a comparatively robust health, that was at length only broken by the severest trials to which it could be subjected.

The permitted truancy from the grammar school for country amusements at the family estate of Long Calderwood afforded compensations which would doubtless have been more complete, if he had not at last fallen into the contrary errors of his brothers.

Omitting other examples and reflections, the present comparison tends to shew, that an encouragement of precocious and rapid acquirements is not favourable to life, nor early tuition and attainments, at least of the kind imparted, to the production of extraordinary genius, but that a natural and primary education of the senses, directed to attractive objects, may supply a better nourished, and more healthily expanding brain with the proper materials of knowledge, by the aid of which, and the continued exercise of the sensuous with that of the higher faculties at a more advanced age, it is likely to display the greatest powers and fruitfulness. His participation in the mechanical arts of the cabinet-maker at Glasgow, at about the age of 17, for his sister's relief, rendered impracticable by the dissipation of her husband, tended to promote further the muscular and osseous developments of that compact and active frame, which, by its uncommon strength and dexterities, was destined to favour the arrest of fibrin and of earthy matter in the denser structures of the heart and arterial system, that proved unable to resist with impunity the force of blood cast energetically upon them, and too often retained by ungoverned anger.

The circulating fluid was also rendered too large in quantity and too stimulating in quality by liquids, which, in unison with the history of Gout, were of the fermented rather than of the distilled character. By them his weak, dilated, and relaxed stomach was always disordered, and the formation

of gall-stones bore evidence of hepatic derangement, not less connected with the disease.

Yet I am anxious to observe, without of course favouring any abuse of food, but as involving the great prophylactic principle that should regulate our management of that consumptive disease of the lung by which he was afterwards threatened from more obvious causes, that a generous living was calculated to retard the tubercular, rather than hasten the arthritic or uric diathesis, except long after the cessation of growth and an accumulation of supplies needed a more vigorous elimination, the want of which marked the same organic defect as that insufficient digestion and nutrition which lie at the foundation of the strumous constitution, and which continued at Hunter's full maturity to be a source of cacoæmia and of mal-assimilation, or deterioration of structure, and of extensive nervous and vascular disorder. It was equally manifested by the disposition to obesity, which completes the picture, the phases, and the effects of a weak, easily excited, and readily obstructed circulation, attended by irritability, strong sexual passion, and psychical characteristics correlating with these and the morbid states, so as to demand, for medical and philosophic objects, a comprehensive, accurate, and profoundly connected biography.

Leaving inquiries, which in the limitation of human faculties, must be reduced to the same generalization of facts, or to an invariable antecedence and sequence of phenomena pursued by sense and consciousness, I may remark more fully of the corporeal states, that their ultimate tendency, unless carefully combated, is to those adipose growths and changes which include an oleaginous condition of the blood, involve the capillaries and larger vessels in augmented obstructions, and the liability to coagulations of blood during life, and the heart in the greatest danger of these, and of the antagonistic states of Angina. "In his youth," says Home, "he was cheerful in his dispo-

sition, and entered into youthful follies like others of the same age; but wine never agreed with his stomach, so that after some time he left it off altogether, and for the last twenty years drank nothing but water."

Doubtless under greatly moderated conditions of energy hazardously sustained, it required ten years of perhaps unexampled labour in some of the worst portions of the polluted air of the metropolis to resolve his acquired vigour into its pristine scrofulous debility, marked anatomically at this period, when he was thirty years of age, by adhesions extending over the front of the right lung, without evidence as yet of an excess of those albuminous and earthy materials which sometimes leave cartilaginous and osseous states of the pleura. It should be distinctly noticed that the exudation now took place upon the free surface, and that the subsequent arthritic depositions occupied the attached or fibrous portions of the affected serous linings.

A sea voyage, and residence with the army from the spring of 1761 to that of 1763 at Belleisle, an island off the western coast of France, and in Portugal, enabled him to cast off the pulmonic disease, to trace the results of pathological and of physiological processes when on active duty amongst the wounded and the dead, to investigate the structure and functions of remnants of the Saurian tribes that could there also best maintain their being upon the planet, and to make geological observations on changes of its crust and surface, and on their statics and dynamics.

Within the compass, Sir, of a single discourse, I am unable to exhibit in detail all the agencies which, on his return to London, favoured the accession of disease from the tissues of the lung to those of the heart and arteries. But amongst others, I would direct consideration particularly to his playful combats with the most powerful of the animals he had collected at Earl's Court, and to a more dangerous control of

the fiercest, while the passing of nights, and the greater part of his time during the autumnal months, in the purer and milder air of the vicinity of Brompton, confirmed, with the lapse of years, the resolution of phthisical disorder, and the restoration of muscular power; to the resumption of lectures, the delivery of which, though persevered in, was always peculiarly disagreeable, and must have been most injurious to him; to the complete development of Gout; to a prolonged matrimonial engagement with Miss Home, and marriage at a time when atheromatous spots, and arterial dilatation, and cardiac enlargement to a certain extent, begin to assume a physiological character, and are amongst the earliest signs of obstructive decay, or of climacteric decline; to the commencement of the publication of his writings, first induced by the pressure of pecuniary wants for the fulfilment of this desire, and their continuance more or less under its consequences near and remote, and the exhausting expenses of his gigantic enterprise, and of his two establishments; to an unwilling and persuaded entrance upon communications to the Royal Society, delayed in some measure by the difficulties he experienced in composition; and finally to the preparation of those lectures to be entered upon for the first time this autumn, which were to embrace no longer either descriptive, general, or surgical anatomy, as successively undertaken, and little of the details of practice, or of operations, but by which he designed to unfold and ripen ideas imperfectly formed, and immature views,—never easy of communication even where a facility of extemporaneous speech exists,—and to give the trial of publicity to novel doctrines, which issued in the revolution of surgery, by aiding so extensively its elevation to the rank of a scientific art, and by imparting the most powerful and enduring impulse to its onward and continued progress through the establishment of fundamental principles.

Under such stupendous efforts, and cumulative morbid in-

fluences, and upon some occasion of mental depression, to which he was thus largely exposed, we cannot wonder that his heart shewed signs of weakness and of failure, by a sudden and painful retardation of the portal blood, made evident at the stomach and nearest its entrance into the liver, with a general diminution of the current towards the right side, lungs, and arteries. Complete recumbency, not demanded by the approach of syncope, was likely to augment the distress by casting more blood upon the congested abdominal organs. Partial reclination, in the repose so long required to far greater extent, would have provided best against these dangers, and for those physiological reactions which, within definite limits, tend always to conserve the harmony of the functions, and would probably have sufficed to restore the balance of the circulation, by increasing the flow of blood into the auricle, and relieving hepatic, inferior caval, and gastro-intestinal obstruction.

When apnœa, or arrest of breathing, occurred from augmented delay in the erect posture, Hunter's voluntary respiration must have maintained a slight stream through the lungs, systemic heart, and brain, and with the persistence of onward contractions and chemical changes, was thus amongst the chief means by which an invaluable life was saved.

"In the spring of 1769," says Sir Everard Home, "in his forty-first year, he had a regular fit of the Gout, which returned the three following springs, but not the fourth; and in the spring of 1773, having met with something which very forcibly affected his mind, he was attacked at ten o'clock in the forenoon with a pain in the stomach, about the pylorus; it was the sensation peculiar to those parts, and became so violent that he tried change of position to procure ease, he sat down, then walked, laid himself down on the carpet, then upon chairs, but could find no relief. He took a spoonful of tincture of rhubarb, with thirty drops of laudanum, without

the smallest benefit. While he was walking about the room, he cast his eyes on the looking-glass, and observed his countenance to be pale, his lips white, giving the appearance of a dead man; this alarmed him, and led him to feel for his pulse, but he found none in either arm. He now thought his complaint serious. Several physicians of his acquaintance were then sent for. Dr. William Hunter, Sir George Baker, Dr. Huck Saunders, and Sir. William Fordyce, all came, but could find no pulse ; the pain still continued, and he found himself at times not breathing. Being afraid of death soon taking place if he did not breathe, he produced the voluntary act of breathing, by working his lungs by the power of the will; the sensitive principle, with all its effects on the machine, not being in the least affected by the complaint. In this state he continued for three-quarters of an hour, in which time frequent attempts were made to feel the pulse, but in vain; however, at last, the pain lessened, and the pulse returned, although at first but faintly, and the involuntary breathing began to take place. While in this state, he took Madeira, brandy, ginger, &c., but did not believe them of any service, as the return of health was very gradual; in two hours he was perfectly recovered. In this attack there was a suspension of the most material involuntary actions; even involuntary breathing was stopped, while sensation, with its consequences, as thinking and acting with the will, were perfect, and all the voluntary actions were as strong as before."

Ascribing this seizure too exclusively to the stomach and its influences, Sir Everard continues, " Mr. Hunter never had any return of these affections of the stomach, though frequently troubled with slight complaints both in the stomach and bowels, which were readily removed by small doses of rhubarb. In other respects, he enjoyed his health till the year 1776. Towards the end of the spring, he was seized with a very severe and dangerous illness, in consequence of anxiety

of mind, from being obliged to pay a large sum of money for a friend, for whom he had been security, and which his circumstances made extremely inconvenient."

Hunter's letter to Jenner, which, as Mr. Ottley observes, corrects the date of this illness by referring it to the same period of the next year, bears witness to the paroxysmal invasion of vertigo, like the outburst of a gathering storm, and the ardent renewal of his favourite pursuits in comparative anatomy, natural history, and palæontology, before its complete subsidence, and when perfect rest, with appropriate remedies, afforded the only chance of escape from permanent cardiac and cerebral arterial lesions. The foundations may have been already laid in both organs, by obstructions and dilatations following the partial exudation of low forms of atheromatous, almost tuberculous matter, with or without the saline ingredients of Gout.

In the parturient efforts of the brain, and especially under its sufferings from congestion connected with a full and labouring heart, the monumental image of Bacon in contemplation, erected by his faithful secretary, should be conformed to more or less; not, as his eloquent master still imagined, that the spirits might rise to its summit, but as a greater teacher of the few comprehensive principles of philosophic investigation, and the more correct demonstrator of a practical method of science, could almost have said, that the supported head may not receive too much arterial blood, and have its venous return facilitated by gravity, which at the same time retains other portions in the limbs from the cavities of the heart and the abdominal organs.

Where physical signs afford evidence of considerable cardiac power, and syncope is not threatened, watchful approaches to this or the semi-recumbent posture are productive of incalculable advantages; and without derogating from the value of medicines which at the present day might be administered most usefully in such a case, it is impossible to say to what

extent this attack, and its sad consequences, might have been arrested by the proper regulation of position alone, which is of the first importance in these affections.

Aggravations by the horizontal posture repeated and long maintained, are manifested by the history. It would be irrelevant to extend observations on this topic, which merits the fullest consideration, and on the cerebral, cerebellar, and spinal symptoms associated with the vessels inflamed; but I may draw attention to the corresponding results of arteritis in impairing the action of the heart, and of the muscles which move the head, independent of depressing withdrawals of blood.

Exaltation of function, followed by diminished contractions, with heat of skin, and fever, not sthenic, or strongly marked, as is usual in the secondary constitutional disturbance of Gout, here probably present the scanty diagnostic signs, aided of course, when existing alone, by the absence of endocardial and pericardial murmurs, of what I have called arterio-carditis, or cardiac arteritis, in distinction from myocarditis, of which the effects in lessening the heart's power are in general more rapid and considerable. In an acute stage this allied phlegmasia has been attended very early with anginous symptoms, of which it not unfrequently establishes, under subacute and chronic forms especially, an organic condition, by changes of the muscular substance that exhibit a great diversity of appearance, and there is ground to believe it thus existed during some of Hunter's attacks, accompanied by inflammation of the attached pericardium, and severe neuralgia, which, occurring in various degrees, also points, in certain states, to the arterial læsions, that should be guarded against by a cautious foresight. Endocardial inflammation of fibrous portions of the valves may at this time have originated their ossific states, or at later periods of an enfeebling congestion of the heart's structures, leading to the extended complications. Mark the triple disturbance of organs by slight dietetic errors,

hich involve the most important preventive principle; the ffects of a quick absorption of small quantities of alcohol on at brain, whose almost uncontrollable actions, excited by ose of its vessels, and blood globules, and by its intense and nthusiastic applications, may well have induced him to com- are his head to a bee-hive; the prejudicial influence of a depri- ation of sleep; and the probabilities that the chain of morbid equences, which was of gradual formation, might have been t short by a more complete attention to and care of health.

"At two o'clock in the forenoon," that is, I may say, at the me he usually retired to bed, "he eat some cold chicken nd ham, and drank a little weak punch. Immediately after is he went eight miles in a post-chaise. While he was on e journey he had the feel of having drank too much, but assed the remainder of the day tolerably well. At twelve 'clock at night his stomach was a little disordered; for which e took some caraways, and went to bed. He had no sooner id down than he felt as if suspended in the air, and soon fter the room appeared to go round. The quickness of this otion seemed to increase, and at last was very rapid. It con- nued for some time, then became slower and slower, till the hole was at rest. This was succeeded by vomiting, which as encouraged, and gave him a good night's rest. Next day e was tolerably well, but fatigued. The morning after, inking himself quite recovered, he went out before break- st, drank some tea, and eat some bread and butter, which he as not accustomed to do. At eleven o'clock, he felt his stomach uch in the same state as before. In about half an hour, the nsation of the room appearing to turn, recommenced, and ontinued for some time, but not with such violence as in the st attack. He became sick and vomited. The sensation of imself and every thing else going round went off; but that of eing suspended in the air continued, with a giddiness. He ow could hardly move his head from an horizontal position;

and about two o'clock was brought home in his carriage, the motion of which was very disagreeable, giving the sensation of going down, or sinking.

"After he went to bed, the giddiness and the idea of being suspended in the air increased, and the least motion of the head upon the pillow appeared to be so great that he hardly durst attempt it; if he but moved his head half round, it appeared to be moving to some distance with great velocity. The idea he had of his own size was that of being only two feet long; and when he drew up his foot, or pushed it down, it appeared to him to be moving a vast way. His sensations became extremely acute or heightened: he could not bear the least light; so that, although the window-blinds were shut, a curtain and blanket were obliged to be hung up against it, the fire to have a screen before it, and the bed curtains to be drawn. He kept his eyelids closed; yet if a lighted candle came across the room, he could not bear it. His hearing was also painfully acute, but not so much increased as his sight. The smell and taste were also acute, every thing he put into his mouth being much higher flavoured than common, by which means he relished what he eat. His appetite at first was very indifferent, but soon became good. His pulse was generally about sixty, and weak, and a small degree of heat on the skin, especially on the hands and feet. He remained in this state for about ten days, and was obliged to be fed as he lay. By this time he was rather better, that is, he could move his head more freely.

"When he was first attacked, the pulse was full, and eight ounces of blood were taken away, but this did not appear to be of service. The day following he was cupped between the shoulders, and had a large blister applied upon the part; he took an emetic, and several times purging medicines, and bathed his feet in warm water; but nothing appeared to be of the least use. The purging and vomiting distressed him

greatly, for both the stomach and intestines were so irritable, that less than half the usual quantity had the desired effect. He took some James's powder, and drank some white wine whey on account of the heat in the skin, especially in the feet and hands, which took it off, and gave him, for the first time, a comfortable feel. At the end of ten days all his ideas of his present state became more natural, the strange deception concerning his own size was in part corrected, and the idea of suspension in the air became less; but for some time after, the fire appeared of a deep purple red. When he got so well as to be able to stand without being giddy, he was unable to walk without support, for his own feelings did not give him information respecting his centre of gravity, so that he was unable to balance his body, and prevent himself from falling."

At the expiration of three months, during which convalescence was gradual, and when, probably, immovable sediments of urates and phosphates had rendered complete recovery no longer possible, whatever science may in future accomplish in this important field of research, Hunter yielded to the advice of his medical friends, and consented to retire to Bath for a while, declaring, in a letter to Jenner announcing his decision, that he was "very well," remained about the same time, drank the waters, and returned, impatiently indeed, and too early, but greatly benefited. His devoted pupil, however, who himself confessed he always "sought the valley and not the mountain," and who attained "a green old age," had there recognised the symptoms of Angina, which is essentially an intermittent affection. The very considerate and judicious letter to Heberden regarding him, dated the ensuing year, and published by Dr. Baron in his life of the great benefactor, and likewise the communication written subsequently to Hunter's death, and inserted by Dr. Parry in the introduction to his able Essay, are full of interest and importance respecting those lesions of

the coronaries, acute and chronic, which Jenner was the first to observe and connect with the disease, notwithstanding the need, as already stated, of broader views, deducible from a wide intervening experience.

In accordance with the characteristic latency both of Gout and of Angina under improved conditions, and the diminution or absence of exciting causes, particularly in their early stages, we have no details whatever of their progress during the next eight years.

The canal of the arteries, we must remember, was nowhere found obliterated after death; and we may conclude that additional transudations from time to time, narrowing their calibre, to be restored to some extent so as to constitute a source of relief by successive fluid absorptions, completed the ossification of their coats. It is thus that we are unable to ascend with confidence, in this and other instances, to the commencement of the most serious changes of the heart's substance, of the brain, and of their vessels, which often consist in occult processes of depraved nutrition, rather than of inflammation, especially in bad habits of body, long engendered, or slowly renewed. So we find an advance of cachexia and of dilatation, exhibited by great alterations in his appearance, and imperfect health, without particular indisposition, displayed at length by well marked, confirmed, and complicated attacks of Angina, occurring in the course of the years 1785 and 1786. Observe the descent of delay and distention closer to the weak and nearly paralyzed heart, viz. from branches of the internal carotids and vertebrals formerly affected, to those of the external carotids and subclavians, to the aorta itself, the left ventricle and the pericardium; the pallor, and disappearance of pulse from engorged cavities at both sides; the oppressed breathing from retarded pulmonic circulation; and the production of hyperæsthesia, or of abnormal sensibility and pains by the pressure upon trunks and filaments of sentient nerves

that may be diagnostically traced, and by their participation to some extent in the hyperæmic and sub-inflammatory states.

You will now also perceive, that to a changeful congestion of organs and tissues, involving almost pathognomonically, as regards both diseases, the extremities and the surface, in connection with opposite states of the heart, with venous and with arterial obstructions, may be referred, amongst other sources of local determination, the sudden, painful, shifting, inflammatory accessions that have received the names of anomalous, misplaced, retrocedent, metastatic Gout. Words of this description should give place, as far as practicable, to a recognition of causes that extend beyond an operation of the arthritic poison upon the nervous structures, and its conveyance by the blood from the joints to the viscera and throughout the body, at certain distant parts of which, for example, the variously compounded medium is liable to a much slower motion, to be frequently chilled, and to have its effete and abounding saline constituents more easily separated or entangled, so as to originate foci of irritation, often with peculiar suffering, at early and common, as well as at deeper and rarer sites of deposit, occurring under different and alleged circumstances.

Depressions, sinking, faltering pulse, and other grave attendants on some of the worst attacks, are thus linked with agencies and conditions I have endeavoured to explain, and with defective renal excretion arising probably in greatest degree from venous congestion of its organs, and we are led to a clearer understanding of complex and dangerous affections described by authors as Gout in the stomach, in the head, the heart, the arteries, and other important irregular forms of a disease which, investigated through all its relations to more general facts, or pathological laws, and known fountains of disturbance, mental and somatic, may be freed from a multiplicity of terms and divisions, and present fewer residual phenomena for special inquiry.

"About the beginning of April 1785," Home proceeds, "he was attacked with a spasmodic complaint, which at first was slight, but became afterwards very violent, and terminated in a fit of the Gout in the ball of the great toe: this, like his other attacks, was brought on by anxiety of mind. The first symptom was a sensation of the muscles of the nose being in action, but whether they really were or not, he was never able to determine: this sensation returned at intervals for about a fortnight, attended with an unpleasant sensation in the left side of the face, lower jaw, and throat, which seemed to extend into the head on that side, and down the left arm, as low as the ball of the thumb, where it terminated all at once. These sensations were not constant, but returned at irregular times: they became soon more violent, attacking the head, face, and both sides of the lower jaw, giving the idea that the face was swelled, particularly the cheeks, and sometimes slightly affected the right arm. After they had continued for a fortnight, they extended to the sternum, producing the same disagreeable sensations there, and giving the feel of the sternum being drawn backwards toward the spine, as well as that of oppression in breathing, although the action of breathing was attended with no real difficulty. At these times the heart seemed to miss a stroke, and upon feeling the pulse the artery was very much contracted, often hardly to be felt, and every now and then the pulse was entirely stopped. He was afterwards attacked with a pain in the back, about that part where the œsophagus passes through the diaphragm, the sensation being that of something scalding hot passing down the œsophagus; he was next seized with a pain in the region of the heart itself; and last of all, with a sensation in the left side, nearly in the seat of the great end of the stomach, attended with considerable eructations of wind from that viscus. These seemed to be rather spasmodic than a simple discharge of wind, a kind of mixture of hiccough and eructation, which last symptoms did not accompany the former,

but came on by themselves. In every attack there was a raw sore feel, as if the fauces were excoriated. All these succeeding symptoms (those in the stomach and nose only excepted) were in addition to the first, for every attack began with the first symptoms. The complaint appeared to be in the vascular system, for the larger arteries were sensibly contracted, and sore to the touch, as far as they could be touched, principally in the left arm: the urine at those times was in general very pale.

"These symptoms increased in violence at every return, and the attack which was the most violent came on one morning, about the end of April, and lasted above two hours: it began as the others had done; but having continued about an hour, the pain became excruciating at the apex of the heart: the throat was so sore as not to allow of an attempt to swallow any thing, and the left arm could not bear to be touched, the least pressure upon it giving pain: the sensation at the apex of the heart was that of burning or scorching, which, by its violence, quite exhausted him, and he sunk into a swoon or doze, which lasted about ten minutes, after which he started up, without the least recollection of what had passed, or of his preceding illness. I was with him during the whole of this attack, and never saw any thing equal to the agonies he suffered; and when he fainted away, I thought him dead, as the pain did not seem to abate, but to carry him off, having first completely exhausted him. He then fell asleep for half an hour, and awoke with a confusion in his head, and a faint recollection of something like a delirium: this went off in a few days.

"The affections above described were, in the beginning, readily brought on by exercise, and he even conceived, that if he had continued at rest, they would not have come on; but they at last seized him when lying in bed, and in his sleep, so as to awaken him: affections of the mind also brought them

on; but coolly thinking or reasoning did not appear to have that effect. While these complaints were upon him, his face was pale, and had a contracted appearance, making him look thinner than ordinary; and after they went off his colour returned, and his face recovered its natural appearance. On the commencement of the complaint, he suspected it to be rheumatism, and applied electricity to his arm, which took it off for the time only; he then, for two or three nights successively, took three grains of James's powder, without any abatement of the symptoms: he next had recourse to the camphorated julep, both at the commencement of the spasm and while it was upon him, but obtained no relief. He tried Hoffman's anodyne liquor, in the dose of a tea-spoonful, and not finding it to answer alone, joined to it the camphorated julep; but the spasms seemed to be more violent. One night he took twenty drops of thebaic tincture, which made his head confused all the following day, but did not at all abate the spasms. The following day he took two tea-spoonfuls of the bark, which heated him, and gave him a headache, thirst, and dryness of his mouth, which prevented his continuing it.

"At the desire of Dr. David Pitcairn, he took the powder of valerian, an ounce a day, which seemed for the first two days to remove his spasms, but they returned on the third with more violence than usual, especially one evening at the Royal Society, which induced him to leave off the valerian, and he bathed his feet on going to bed in warm water, mixed with half a pound of flour of mustard, and took a tea-spoonful of tincture of rhubarb in ginger tea; also wore worsted stockings all night.

"On Friday morning, the 20th of May, between six and seven o'clock, he had a violent spasm, attended with most violent eructations of wind from the stomach for nearly a quarter of an hour. Dr. Pitcairn, who was sent for upon this occasion, asked him if there was any distress upon his mind

that had brought on this attack; and he confessed his mind to have been much harassed, in consequence of having opened the body of a person who died from the bite of a mad dog, about six weeks before, in doing which he had wounded his hand; and for the last fortnight his mind had been in continual suspense, conceiving it possible that he might be seized with symptoms of hydrophobia. This anxiety praying upon his mind for so long a time, there is every reason to believe was the cause of the present attack, and probably had also brought on the former ones, which were all after the accident which had impressed his mind with this horrible idea.

"At the desire of Dr. Pitcairn, he took at two doses, in the forenoon, ten grains of assafœtida and three grains of opium, and in the afternoon fifteen of assafœtida and one of opium: in the evening he had a headache, which was supposed to be brought on by the opium. His bowels were loaded and oppressed with wind, and he endeavoured in vain to procure a motion by laxative clysters, although repeated, and ten grains of jalap were taken by the mouth. He passed a very restless night. On Saturday morning he was visited by Sir George Baker, Dr. Warren, and the late Dr. Pitcairn. He repeated the assafœtida twice in the course of the day, and two spoonfuls of the following mixture were taken every hour, without producing a motion till about half an hour after the whole was passed—

Infusion of senna, six ounces,
Tincture of senna, one drachm and a half,
Soluble tartar, three drachms —M.

"In the afternoon he had another evacuation; soon after which, the most violent attack of spasm which he experienced came on. Nothing was attempted internally during the attack, which lasted two hours: a bladder of hot water was applied

to the heart, and afterwards to the feet, without any effect. The assafœtida was now left off; and this evening he began the oleum succini in saline draughts, fifteen drops every six hours. On Sunday morning he continued the oleum succini; but the saline draught was changed to cinnamon-water, and a large blister was put upon the back, close to the neck: he continued pretty free from spasm. On Monday the blister was taken off, and the oleum succini continued; but about nine o'clock at night he had threatenings of spasm, with headache, and the feel of a load in his bowels: he had a pain in the left side and region of the stomach, with violent eructations of wind from the stomach, which lasted about two hours; he took thebaic tincture, twenty-five drops, in the warm tincture of rhubarb, and afterwards some baume de vie; but the eructations continuing, sinapisms were applied to the feet, after which they ceased, and the sinapisms were so troublesome, that he had them taken off five hours after they were applied. On Tuesday morning he felt himself easier; the oleum succini was continued, five drops of laudanum being added to each dose. In the evening he bathed his feet in warm water to clean them from the sinapisms, and both the great toes appeared a little inflamed, and very tender: they were more painful after being bathed, and were very troublesome all night. On Wednesday morning the inflammation and swelling in the great toes appeared evidently to be the Gout; and the pain continued very acute till Thursday, when it began to abate; and on Friday was very much diminished. He continued the oleum succini on Wednesday, and took a bolus of aromatic species before each dose; but on Friday the oleum succini made him sick, and was left off. On Saturday he began the bark in tincture and decoction with the species aromaticæ: Sunday, continued the bark; and having eructations and flatulencies after his meals, he was ordered every day, before dinner, rhubarb fifteen grains, ginger ten grains, in a bolus. He had no

pasm after Monday, the 30th of May: he, however, had
reatenings, or slight sensations, similar to those which pre-
eded the spasms, and occasional eructations. Although
vidently relieved from the violent attacks of spasm by the
out in his feet, yet he was far from being free from the disease,
r he was still subject to the spasms, upon exercise or agita-
on of mind. The exercise that generally brought it on was
alking, especially on an ascent, either of stairs or rising
round, but never on going down either the one or the other:
e affections of the mind that brought it on were principally
nxiety or anger. It was not the cause of the anxiety, but the
uantity that most affected him: the anxiety about the hiving
f a swarm of bees brought it on; the anxiety lest an animal
hould make its escape before he could get a gun to shoot it,
rought it on; even the hearing of a story, in which the mind
ecame so much engaged as to be interested in the event,
lthough the particulars were of no consequence to him,
ould bring it on; anger brought on the same complaint; and
e could conceive it possible for that passion to be carried so far,
s totally to deripve him of life. But what was very extra-
rdinary, the more tender passions of the mind did not produce
. He could relate a story which called up the finer feelings
—as compassion, admiration for the actions of gratitude in
thers—so as to make him shed tears, yet the spasm was not
xcited. It is extraordinary that he eat and slept as well as
er, and his mind was in no degree depressed: the want of
xercise made him grow unusually fat.

"As he had not drank wine for four or five years, he was
dvised to try it, which he complied with, but found the spasms
ore easily brought on after using it, than on those days on
hich he drank none; and they were always more readily
roduced after eating a hearty meal.

"He continued very much in the same way till August, when
e went to Tunbridge, and drank the waters for about a fort-

night, without the least benefit, but rather conceived he was worse. From thence he hurried to Bath, the first week in September, and drank the waters for four weeks, twice before breakfast, and once at noon. Having drank them for about a fortnight, he began to bathe every other night in the hot-bath, and on the intermediate nights put his feet into the hot-bath waters, and sometimes rode on horseback. After being there three weeks, he did not find the least benefit; but on Monday, the beginning of the fourth week, he found that his walking to the pump-room in a morning did not bring on the spasm as usual, and found also that he could extend his walk very considerably on that day. On Tuesday he was not quite so well, although, when he compared that day with the preceding days, or rather months, he could say that he was better. This seemed to be a step gained. In this state he left Bath, and continued the same through the whole winter. About the beginning of May 1786, he began to believe that the exercise he was able to make use of affected him less: he found that in the months of June, July, August, and September, he was able to take a long walk slowly: he could, however, at any time bring on the complaint; for upon using the least exercise, he felt as if it was coming on: and often, by forgetting himself, he brought it on slightly, which made him slacken his pace. In the month of October, when the weather became cold, he was obliged constantly to use his carriage, because he could not walk sufficiently fast to keep himself warm, although in other respects he was not affected by it. What appeared very extraordinary was, that the spasm did not come on equally upon all kinds of exercise. He often performed an operation,—as cutting for the stone, or extirpation of a breast,—which, from peculiar circumstances, required a considerable deal of fatigue, and lasted near an hour each time, yet the spasm did not come on. He was employed in embalming the Princess Amelia for three hours, in which time he was really fatigued,

but had no spasm the whole time; yet, by going the length of Cavendish Square, and on towards Oxford Road, he was seized with a considerable spasm; but the fatigue he had undergone acted, probably, as a predisposing cause.

"These spasms, although they did not increase in violence, were uniformly more frequent, and came on upon a greater variety of occasions; but as he became accustomed to their effects, less attention was paid to them."

In evidence of the production of these pains by inordinate fullness of the heart, or of particular cavities and vessels determining a more precise seat of distention, and not by spasm, I will very briefly select, from amongst more common cases of cardiac disease, and from such as relate to arterial stagnation and pressure, two observations made on the bodies of persons who had died in the agony of Angina.

A shoemaker was riding in a chaise cart, from Bagnigge-wells to the Edgware Road, and, approaching Baker Street, was seized with præcordial pain and faintness, and descended at the tavern to obtain some brandy and water. Here the anguish increased, and he was led to Mr. Anderson's residence in York Place, a few doors beyond. At this moment I happened to call on my friend, and was shewn the man lying upon the floor: his pulse was gone, and I could discover by the hand and ear no signs of the heart's action. By the kindness of Mr. Anderson, I attended the inspection on the following day, when Mr. Barker, of the Edgware Road, was also present. The pericardium was greatly distended by a heart gorged with blood on both sides, but especially at the right. The lungs partook of the internal congestion. For this breast-pang, no other organic cause appeared than a fissured diminution of the mouths of both coronary arteries by cartilaginous and semi-osseus plates beneath the lining of the aorta. Beyond them these vessels were free from disease, with the exception of a few minute points of atheroma. To

the naked eye, the muscular structure presented little or no appreciable change; but the deprivation of its normal amount of arterial blood exposed it to failure on occasions of additional fullness of the heart's cavities.

In the next year, a man named Johnson was brought dead on a shutter into Guy's Hospital. He was a porter, and had been engaged in carrying sacks of potatoes. He had taken two turns, and was waiting for a third, when he placed his hand over his heart, and complained of great pain. His companion prevented a fall, which might have afforded a chance of recovery from the syncope, and he died in five minutes. Looking to the strains to which his occupation had before exposed the aorta, and the circumstances of the sudden attack, which was mainly induced by the muscular efforts, I mentioned to my lamented friend, Mr. King, who was about to examine the body, my expectation that the openings of both coronaries would be found more or less closed by subserous effusion, and the heart overwhelmed with blood at its right side chiefly, narrating at the same time the former case. The patch of inflammation at the commencement of the aorta, which had constricted the arteries at their origin, appeared to be only of a few weeks standing. The pericardium was equally distended by the right heart, but less by the left, the lungs being entirely free from congestion, and emphysematous to some extent. Apparent effects upon the walls of the heart were also not considerable: a certain degree, however, of paleness and looseness, out of the body, was very perceptible on comparison with the heart of a man who had died of hernia, and which had been removed an hour before. The parts are preserved in the museum of Guy's Hospital, with their history. I communicated these cases, in full, to the Harveian Society, at the beginning of the year 1842, with others that formed a series illustrative of the same kind of seizure, and of sudden death by a defective re-

turn of blood to the pulmonic heart, without pain at its region, and of the various ways in which the orifices of the coronaries are subject to occlusion in the course of acute and chronic affections of the mouth of the aorta.

Three more years of Hunter's life bring renewed cerebral attacks, similarly dependent on diminished and retarded currents through the nutrient vessels, which had become deprived of their elasticity and contractile power, the engorgement of veins and sinuses, and most likely some results of fresh inflammation extending to central organs of the brain, and coincident with the gouty arrest and vicissitudes of urinary deposit, and likewise of an atrophy, analogous to that of the heart's substance, but delayed in consequence of an extensive and peculiar provision for anastomoses both by branches and by capillaries, wholly wanting to the coronary circulation, if we admit not a supply through the foramina Thebesii, as maintained by Dr. Spurgin. You will, I hope, pardon me, if, to spare your kind indulgence, I leave the valuable account of them for the private study of members, with that of much more frequent cardiac seizures, aggravated by arterial and valvular obstructions, and, in all probability, fatty changes of healthy, and of previously morbid structures, in order to notice further, but succinctly, characteristic derangements of respiration belonging to Angina.

"Nothing particular occurred from this period, till about the beginning of December 1789, in the evening, when at the house of a friend on a visit, he was attacked with a total loss of memory: he did not know in what part of the town he was, not even the name of the street when told it, nor where his own house was; he had not a conception of any place existing beyond the room he was in, and yet was perfectly conscious of the loss of memory. He was sensible of impressions of all kinds from the senses, and therefore looked out of the window, although rather dark, to see if he could be made sensible of the situation of the house.

This loss of memory gradually went off, and in less than half an hour his memory was perfectly recovered. About a fortnight after, as he was visiting his patient one forenoon, he observed occasionally a little giddiness in his head, and by three o'clock it was attended with an inclination to vomit. He came home and drank some warm water, which made him vomit severely, but nothing came off his stomach except the water. The giddiness became severe, but went off again about seven or eight o'clock; about nine or ten it returned with more severity; and when going to bed, about eleven o'clock, he had entirely lost the centre of gravity, although he could move his limbs as the will directed. Light became offensive, and every thing had a kind of yellow cast; sounds were more acute than natural; objects had lost their true direction; a perpendicular, for instance, seemed to lean to the left, making, as nearly as he could conjecture, an angle with the horizon of fifty or sixty degrees; objects were also smaller than the natural recollection of them; his idea of his own size was that of only being four feet high; also objects appeared to be at an unusual distance, as if seen through a concave glass; he had a slight sound in the right ear at every stroke of the pulse; motion in his head was extremely disagreeable, he therefore moved with great caution; although coughing and sneezing did not affect it. During this illness Dr. Pitcairn and Dr. Baillie attended him. It is difficult to describe sensations, especially when they are not common: the sensation which he had in his head was not pain, but rather so unnatural as to give him the idea of having no head. With all this, neither the mind nor the reasoning faculty were affected, which is not the case when such effects are produced from liquor. Objects in the mind were very lively, and often disagreeably so; dreams had the strength of reality, so much so as to awaken him; the remembrance of them was very perfect. The disposition to sleep was a good deal gone, an

hour or two in the twenty-four being as much as could be obtained; these symptoms were much the same for about a week, and began gradually to diminish, so that in a fortnight he was able to sit up, and in three weeks went an airing in the carriage. Cordial medicines were given, and the body kept open. He felt a pain in the joint of the great toe, which inflamed gently, but soon left it; his pulse was rather increased in frequency: the urine at first was high coloured, deposited a sediment, and was rather diminished in quantity; but the retention in the bladder was very great, as he was not able to make water from ten o'clock in the evening till the same time the next evening, the quantity being very considerable, although not so much as would have been made in the same time had he been in health. The urine became of a yellow colour, and afterwards pale; the stools were solid; the taste of victuals was not impaired, except tea, for which he had no relish. Although he had no particular inclination to eat, yet his appetite was not much diminished. To excite the action of the Gout, sinapisms were applied to the feet, but had not the desired effect: in the fourth week the head not recovering so fast as was expected, a blister was applied between the shoulders, but had no immediate effect, probably did harm by producing irritation and want of sleep. One night, not having above an hour's sleep, he drank a tumblerful of hot water, which set him immediately to sleep, in which state he continued near four hours. He took a hint from this, and drank a tumblerful of hot water every night, just before he went to bed, which did not fail of putting him soon to sleep, and giving him a good night's rest. The apparent obliquity of objects he accounted for by supposing that the two corresponding oblique muscles had an unnatural contraction, which moved the two eyes round near thirty or forty degrees. We shall suppose that the obliquus superior of the left eye brought the eye-ball forwards towards the nose,

while the obliquus inferior of the right eye contracted equal to the superior of the left; this turned the under part of the right eye inwards towards the nose, and the upper part outwards, which moved a lateral part of the eye upon the object, and gave it that obliquity.

"His recovery from this indisposition was less perfect than from any of the others; he never lost entirely the oblique vision; his memory was in some respects evidently impaired, and the spasms became more constant; he never went to bed without their being brought on by the act of undressing himself; they came on in the middle of the night; the least exertion in conversation after dinner was attended by them: he felt therefore obliged to confine himself within a certain sphere of action, and to avoid dining in large companies. Even operations in surgery, if attended with any nicety, now produced the same effect.

"In the autumn 1790, and in the spring and autumn 1791, he had more severe attacks than during the other periods of the year, but of not more than á few hours' duration: in the beginning of October 1792, one, at which I was present, was so violent, that I thought he would have died."

"It is a curious circumstance that the first attack of these complaints was produced by an affection of the mind, and every future return of any consequence arose from the same cause; and although bodily exercise, or distension of the stomach, brought on slighter affections, it still required the mind to be affected to render them severe; and as his mind was irritated by trifles, these produced the most violent effects on the disease. His coachman being beyond his time, or a servant not attending to his directions, brought on the spasms, while a real misfortune produced no effect."

The case of Seneca, graphically described by himself under the term "Suspirium," and extracted by Parry and Stokes, belongs to the anæmic form of attack first illustrated, and is to

be referred to that defective current towards the lungs, which threatens asphyxia, or, etymologically and definitely, suspension of pulse, and painless, fatal syncope. Suspirious breathing, attendant occasionally on the fatty heart as recorded by Dr. Cheyne, occurs in various degrees, from other sources of failure, and is typified by the forced respiration of Hunter, so as to constitute a principle that should be carried out by the most prompt and assiduous means, under particular circumstances of asphyxia. When the ganglionic nervous influence, and the involuntary spinal functions are less interrupted, sighing is a reflex, or, in certain states, a centric automatic action that powerfully aids the entrance of blood into the lungs, and in children is sometimes mistaken for crowing inspiration, or that laryngismus stridulus which in other instances produces the obstructive and compressive congestions that give rise to its conditions in the way I have described. But expiratory efforts assist the exit of decarbonized, or of imperfectly oxygenated blood, and the arterial supplies, including those to the pulmonary tissues and the respiratory muscles and nerves by the bronchial and other arteries, and to the medulla oblongata and cervical portion of the spinal cord by the vertebrals, an inadequate current through such vessels as well as the pulmonary artery being one of the chief causes of apnœa. In like manner, remarkable variations of pulse and anomalous cardiac phenomena are displayed, and leave us at times in doubt to what extent interceptions and disorders of innervation, proceeding from functional and organic lesions of the nervous system at peripheral and central portions, exclusive of local arterial disease affecting all the textures of a part, and an impaired sanguineous fluid, prevail over other causes of retarded circulation and respiration.

Compressive thoracic efforts expelling blood to the left heart, aorta, the coronaries, and onwards, seem to have been habitual to Hunter, and apparent to the writer, whose description of him

is extracted by Dr. Adams, and who affirms, in the midst of it, that "by the exertions which he constantly made, after the manner of something like a cough, he seemed as if he solicited to set the circulation of blood a going."

Time, Sir, has before warned me that I should bring these observations to a hasty close without allowing an opportunity of condensing all the comments I had penned in passing more carefully over the life of Hunter in its pathological, hygienic, and therapeutical aspects. Enough, I trust, has been done in the development of clear and definite principles to enable the youngest of my hearers subsequently to perceive, in large portions of his notes I have not read, the great importance of maintaining, for depurative and other objects, the fluid supplies (always without excess), even by the simple recourse to a tumbler of hot water at night; the quiet occupations and contemplative habits, the softer sentiments and more benign emotions that may be indulged in, whilst regular exercise on level ground to an extent that can be taken is demanded, to prevent accumulations of fat also, and further degenerations; to see the necessity of regarding Angina, not as a mere assemblage of symptoms, but neglecting the name, as a manifestation of diagnostic signs which, with attentive physical examinations, should lead us to an accurate knowledge of the state of the circulation at each part of the heart, and of the system at large; to understand its relations to Gout through the effects of excessive and of surcharged blood, and of the deteriorated fluids and solids of the progenitor, and the reciprocal promotion of external and of internal podagrous affections by its varying congestions, where the disposition or material exists; to notice the futility and mischief of an administration of antispasmodics and purgatives without a discrimination, as precise as can be obtained, of the condition of organs, and of bloodvessels, of structures capable of spasm, and of nerve cells, conducting tubes, contents, investing sheath, and mem-

anes, at different portions of an entirely connected nervous ap-
ratus, though diffusible stimulants, warm aperients, and car-
inatives may be urgently demanded;—of an exhibition of
rcotics, which need additional caution in their use, from a
ndency to diminish further cardiac and other movements in
e degree to which sensation is controlled, and equally under
e advantages of a local treatment of neuralgia at distant
rts by sedatives which may get into the blood in dangerous
nount; to recognise the care we should exert to prevent
flammation and its products, and promote absorption, with-
t lessening power to degrees that lead to irremediable
latations and a premature decease; and lastly (that I may
propriately include a rule formerly deduced from a prolonged
inical observation of more common forms of heart disease),
comprehend the mode in which we should limit to a re-
oval of its causes, all attempts to check that hypertrophy,
hich, when not opposed by obstructed coronaries, and other
cal and various constitutional conditions, is established,
nder permanent impediments, by a physiological law an-
ounced by Hunter, that provides for the requirements and
e purposes of the capillaries and of the veins, and obviates,
great measure, the predominant evils of arterial and of cardiac
elay. Such, Sir, I humbly conceive, is the method of
cience, with whose torch, as a necessary handmaid, we must
er hold up and transmit the light of Philosophy.

W. M. Watts, Crown Court, Temple Bar.