

JAMES BLUNDELL, M.D.

“Animo vidit; ingenio complexus est; eloquentiâ illuminavit.”

PATERCULUS.

IN the preceding Memoirs, it hath been the writer's aim to dwell upon the qualifications essential to a practitioner of the medical art, and to illustrate the several points by reference to particular individuals. To accomplish this object, a Biographical History of Medicine, embracing a notice of all those who have contributed to the advancement of Medical Science, seems peculiarly fitted. A late venerable prelate,\* no less characterized by his great piety and erudition than by the sweetness of his disposition and the entire harmony of his nature, whom to have known is esteemed by the writer of this article a high honour and great gratification, has given it as his opinion, that “Biography is certainly one of the most amusing, and may be made one of the most useful, species of literary composition, when the subject of it is a person very eminent, either in point of talents or of situation, because the sentiments and conduct of such a person cannot but have considerable weight with others.” These observations apply with especial force to the physician whose name is affixed to this memoir, for in him are to be found all that is requisite to form the physician, the physiologist, and the man of science. His classical attainments are of a high order, and his professional not less distinguished. The proper education of a physician leads not only to a full acquaintance with the knowledge of his particular science, but to the cultivation and improvement of the highest faculties of his mind, the formation of a perfect taste and a sound judgment. In no science is metaphysics of greater aid than in that of physiology; but few physiologists are metaphysicians, or even logicians. Yet how is it possible, without this knowledge, to distinguish between true and erroneous reasonings, to mark probabilities from facts, or hypothesis from theory?

\* Bishop of Norwich.

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Dr. Blundell has directed his researches chiefly to physiological science, and applied them to the practice of medicine and surgery in general. He has been no less distinguished by his cultivation of obstetric science, and for many years enjoyed the highest reputation as a lecturer on this branch of medical knowledge. A certain knowledge of the leading principles of midwifery is necessary to the physician in general practice, as he is frequently called upon to treat many disorders incidental to the parturient state, or that are subjected to such a condition of the system. It is no less necessary, indeed it is more essential, to the physician accoucheur, to be intimately acquainted with all the branches of study which ought to be familiar to the general physician. The treatment of diseases must be regulated by a knowledge of the structure of the human frame, and an acquaintance with the laws of the animal economy, and these are of equal importance to both classes of practitioners. Formerly the obstetric practitioner possessed but little knowledge beyond that which he derived from manual practice, or an ordinary routine of similar cases, needing, in the majority of instances, but little erudition, and the exercise of little judgment. The case is now different, and happily so, for the care of the parturient female, and the diseases connected with the gravid state, are placed under the most competent and judicious hands, and receive all the assistance which humanity and science can afford, in the most trying, and often the most perilous, of situations. The importance of this is most strikingly shown in the influence of the moral on the physical faculties of the human species, and the reaction of the physical on the moral in many of the changes and diseases incidental to the female sex, and these are points which have been carefully observed and conspicuously illustrated by the subject of this memoir.

Dr. JAMES BLUNDELL was born in London, on the 27th of December, 1790. He received an excellent classical education, principally under the tuition of the Rev. Thomas Thomason, A.M. Cantab., a man eminent for his benignity, piety, and erudition, and of whose care and attention Dr. B. always speaks with the most grateful remembrance. His professional education was chiefly obtained at the United Southwark Hospitals, where he studied anatomy under Mr. Cline, Sir A. Cooper, and Mr. H. Cline, and attended the demonstrations by Mr. Saunders. He attended the lectures of Dr. Cholmeley on Therapeutics; Dr. Curry and Dr. Babington, on the Practice of Medicine; Dr. Marcet, Dr. Babington, and Mr. Allen, on Chemistry and Experimental Philosophy; Sir A. Cooper, on Surgery; and Dr. Haighton, on Midwifery and on Physiology. To the latter, (his maternal uncle,) Dr. Blundell is anxious to seize every opportunity of

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expressing his obligations. In a letter addressed to the writer of this, he most feelingly says, "To Dr. Haighton I owe all a man can owe, both in the way of precept and example. I had the inestimable advantage of residing with him for years. He was a man of the kindest heart, and of a very generous disposition; of *moral* character unspotted; of first-rate physiological attainments in his day; an excellent anatomist; a cautious, safe, and able physician; a man who had that remarkable regard for the sanctity of truth, which made him exact in all his observations; most veracious in his statements, and a guide that may confidently be relied upon wherever he speaks to facts. He was a little irritable, but it was only a 'hasty spark;' and how could a man up at nights, worried with cough, &c., be otherwise? There was this very remarkable in his character, that, of all things, folly used to vex him; he could not laugh at her cap and bells." This is a just and an estimable testimony to the merits and character of a distinguished physiologist and physician, one who was

" For deep discernment praised,  
And sound integrity, not more than famed  
For sanctity of manners undefiled."

COWPER.

Having received the course of education thus stated, Dr. Blundell went to Edinburgh, and there had the advantage of attending the lectures given by Dr. Monro, Drs. Duncan, sen. and jun., Dr. Home, Dr. Rutherford, Dr. Hamilton, Dr. Hope, Dr. Gregory, and Mr. Fyfe. He acquired information also on botany and medical jurisprudence, subjects of which little notice was taken in London thirty years ago. Thus prepared, Dr. Blundell took his degree. He graduated at Edinburgh in June, 1813, and the subject of his inaugural thesis was "*De sensu quo melos sentitur*," in which he endeavoured to prove that the senses for music and of hearing were distinct, though dependent. He returned to London, and in August, 1814, then only twenty-four years of age, began to lecture, in conjunction with Dr. Haighton, on midwifery, and two or three years afterwards commenced a course on physiology. He was admitted a licentiate of the Royal College of Physicians in 1818. He succeeded Dr. Haighton as Lecturer upon Physiology and Midwifery in the united schools of St. Thomas and Guy's Hospitals. He has regarded the term physiology in its most extensive acceptation, as signifying the science which has for its object natural substances generally; the powers with which these substances are invested; the laws which regulate these powers; and, where they are cognizable by the human intellect, the causes upon which these laws and powers depend.

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As applying, however, to living substances, (the ordinary signification of the term,) it naturally falls under the division of human and comparative; the former appertaining to man alone, the latter to the inferior or brute animals and to plants. Dr. Blundell has arranged the animal powers under the heads of assimilation, organization, ventilation, motion, generation, the powers of the mind, and those powers which are operative in the two states of vitality, passive as well as active. He considers all that has hitherto been written on the subject of organization, to be merely superficial and ill-ascertained, and that the knowledge we possess of the sensorial powers, or the powers of the mind, is in a very confused state. He has powerfully delineated the two distinct classes of men, as it relates to their intellectual powers; those who rather receive knowledge and communicate it, and those of more vigorous powers, capable of thinking for themselves, fond of thinking for themselves, men who take more pleasure in the operations of the intellect, than in the Circean styes of sensuality. This class of men are not satisfied with merely acquiring those parts of science which are already known, but they make incursions into unknown regions, and subjugate, as it were, fresh territories of the intellectual world. To the former he recommends assiduity; to the latter, whom he styles the "demigods of the human species, the cementing link between man and superior intelligences," he holds a different language. And, he adds, "I love physiology for the good it has done for the human race, but I am ashamed to confess how full the system is of errors, how full of false opinions, how fettered with prejudices, by which, like Enceladus under *Ætna*, even the most vigorous minds are oppressed. *Think for yourselves*, is the first lesson which I would inculcate: do not let my opinions, or the opinions of any of my distinguished colleagues, have more weight with you than truth and nature entitle them to. In religion, faith is essential; in physiology, a philosophical scepticism."

In a preceding Memoir, (Baron Haller,) the subject of inflicting pain upon, and occasioning the death of animals for scientific purposes, has been considered. Dr. Blundell has argued this matter in a most able manner, and it cannot be better stated than in his own words:—"They who object to the putting of animals to death for a scientific purpose, do not reflect that the death of an animal is a very different thing from that of man. To an animal, death is an eternal sleep; to man, it is the commencement of a new and untried state of existence. Can no object whatever justify us in putting animals to pain? Are not the very persons who raise these objections, in the habit of torturing animals in hunting? Do they not murder pheasants and massacre partridges? Is not pain daily

and hourly inflicted on the inferior animals, to contribute to the support or pleasure of man; and shall it be fastidiously objected to, when inflicted for the purpose of advancing physiological and medical knowledge? Shall it be said that the objects of physiological science are not worth the sacrifice of a few animals? Men are constantly forming the most erroneous estimates of the comparative importance of objects in this world. What influence, I ask, has the battle of Actium now on the destinies of mankind? what will the battle of Trafalgar have a thousand years hence? Of what importance is it now to mankind, whether Antony or Augustus filled the imperial chair? and what will it matter, a few centuries hence, whether England or France swept the ocean with her fleets? But mankind will always be equally interested in the great truths deducible from science, and in the inferences derived from physiological experiments. The fact that life may be saved by the transfusion of blood into the veins, will be as beneficial a thousand years hence as it is at this day. I will ask, then, whether the infliction of pain on the lower animals, in experiments, is not justified by the object for which those experiments are instituted, namely, the advancement of physiological knowledge? Is not the infliction of pain, or even of death, on man, often justified by the end for which it is inflicted? does not the judge sacrifice the criminal for the good of society? and the general lead his troops to slaughter, to preserve the liberties of his country? It is not the infliction of pain or death for justifiable objects, but it is the taking a savage pleasure in the infliction of pain or death, which is reprehensible. The Iagos and Zelucos of the human race, the man-tigers, who delight in cruelty, are just objects of abhorrence; but when animals are sacrificed on the altar of science, that nature may reveal her secrets, the means are consecrated by the end for which alone experiments are instituted by the votaries of knowledge, and the friends of the human race. Here, then, we take our stand; and we defy the puny drivellers of the press, the declamatory and spurious orators of the day, to drive us from it. We defend the sacrifice of animals, in so far as it is calculated to contribute to the improvement of science; and, in those parts of physiological science immediately applicable to medical practice, we maintain that such a sacrifice is not only justifiable, but a sacred duty."

The argument contained in the foregoing passage is pursued by reference to the importance of transfusion, and other experiments by which human life has been saved, and most completely repels the abuse, and exposes the weakness, of that reasoning by which it has been attempted to check the progress of physiological knowledge, by raising an idle cry

against those who, by experiments upon animals, have contributed so much to the advancement of our knowledge of the manner in which the functions of the animal economy are performed.

In 1825 Dr. Blundell published a volume of "Researches, Physiological and Pathological; instituted principally with a view to the Improvement of Medical and Surgical Practice." These bear reference chiefly to abdominal surgery, to the physiology of generation, and the transfusion of blood. On the former head, the experiments and facts were read before the Medico-Chirurgical Society in 1823, and they were made principally on rabbits, selected because the tenderness of the abdomen in these animals appears to be equally great with that of the human species. Dr. Blundell shews that the great dread of committing injury to the peritoneum, is not well founded, and he infers that a bolder abdominal surgery may fairly be practised, and has submitted a list of various abdominal operations to the consideration of future surgeons. These experiments, and other circumstances connected with various operations that have been since performed, have contributed very much to remove the fears formerly entertained; and it is the opinion of most of our best qualified surgeons, that the injuries anticipated from wounds of the peritoneum, are not of a nature so formidable as generally estimated. In the operations for paracentesis, (tapping,) hernial operations, &c., it is seldom that inflammation of any extent ensues, and more serious lesions of the membrane have in many cases been known to occur, without symptoms of important injury having succeeded them. It is sufficient to state, that the Cæsarean section has been frequently performed with success.

Dr. Blundell has carried the opinions expressed by him, in relation to a bolder system of abdominal surgery, into practice. The extirpation of the uterus has been justly designated as "the most formidable to which the human frame has submitted, or modern surgery dared to relieve;" and this has been successfully performed by Dr. Blundell. The operation was undertaken in the month of February, 1828, in the presence of Dr. Elliotson, Mr. Key, Mr. Morgan, and Mr. B. Cooper. It was a case of malignant bleeding ulceration of the uterus, a disease uniformly fatal in its result. The patient was exceedingly exhausted by the long continuance of the disease; but as no other organ appeared to partake of the malady, Dr. Blundell resolved upon proposing the extirpation of the diseased part; and to this the poor woman readily assented. The record of this extraordinary operation has never yet been given at large: it was performed February the 12th, 1828: the death of the patient occurred February the 7th, 1829; so that she lived twelve months within a few days. During

this period, she became plump and well, and, for a woman about fifty, enjoyed most excellent health. Her death was clearly occasioned by enteritis, following constipation, produced mechanically from constriction and altered position of the bowel. An account of the method of operating is given in the *Medical Gazette* and the *Lancet*; and a pretty full account of the autopsy, by Dr. Hodgkin, appeared in the *Medical Gazette*. (Vol. iii., p. 797.) Dr. Blundell has operated in *three* other cases, but the results have been unfavourable: one dying two or three hours after the operation; another, nine hours; a third, about forty hours. They were all cases without other hope. The successful case came second in order; and without its occurrence, the other two would not have been attempted. Mr. Banner, of Liverpool, has also extirpated the uterus, but the patient died on the fourth day after the operation. Dr. Siebold, of Berlin, extirpated the uterus in 1815, but the patient lived only sixty-five hours. Dr. Holscher performed it in 1824, and the woman died twenty-four hours after the operation. Professor Recamier, of the *Hôtel Dieu*, performed it in 1829; the account of the case is given up to the 12th day only, at which time the woman was improving. Solitary instances of success are scarcely sufficient to justify the performance of the most dangerous operations. They excite so great a dread, that patients, strong as the desire of life may be, will be deterred from submitting to operations which may safely and necessarily be performed. There are but few cases in which so formidable an operation can be justly proposed or performed. Dr. Blundell's was, however, an instance of this kind, as the issue demonstrates. The chances of recovery are too small to render its performance a matter of frequent occurrence. Few professional men will venture their reputation upon such slight ground for hope of success. And it is the opinion of Dr. B. himself that the case derives its chief value from the proof which it affords of the solidity of the general principle upon which it was grounded—namely, that the power which the abdomen possesses of sustaining the operations of the surgeon, is greater than might have been supposed.

On the subject of GENERATION, the second in the volume of "Researches," Dr. Blundell has shewn that the *corpus luteum* is not necessarily an evidence of female impregnation, as it has been found in cases where complete conception has not and could not have taken place. The importance of this fact, and the statements upon which it is founded in a medico-legal point of view, must forcibly strike every person. The experiments were completed before the year 1819, and published in the tenth volume of the *Medico-Chirurgical Transactions*. The third part of the work relates to TRANSFUSION. In former times an opinion prevailed that the majority of diseases originated in, or were essentially

connected with, a morbid or peculiar condition of the blood ; and Dr. Lower in 1660 proposed to establish a new method of cure by transferring the blood of animals into that of the human species in such a way as to abstract all that was morbid or diseased, and to substitute in its place that which was healthy. This subject excited very great attention, and the happiest results were anticipated from its introduction : but, alas ! in the instances in which it was resorted to, it proved fatal ; and the practice excited such serious apprehensions for the safety of the individuals on whom it was proposed to be employed, that we find the French legislature absolutely publishing an edict to forbid the having recourse to it. The earliest experiments are said to have been made in France, and the first attempt by Hansheau in 1658. Lower perfected it in 1665. Denis, a physician described as “ plus occupé des jeux de hazards, que des jeux de la machine animale,” subjected a man to the experiment. The Italians repeated it in 1668, Biva and Manfredi making the experiments. In Flanders, Sinnabaldus did the same. The first four volumes of the Philosophical Transactions relate the cases in which it had been employed, and with such unsuccessful results. It remained for our own day to demonstrate that the practice may be, under some particular circumstances, resorted to with perfect safety and success, and to Dr. Blundell chiefly the merit of this discovery is owing. From his experiments, it appears that blood may be transferred from one animal into another, provided it be of the same species ; but if of one animal into another of a different species, then the result is fatal. The experiments of M.M. Prevost and Dumas have confirmed those of Dr. Blundell. The manner in which he arrived at this knowledge deserves to be particularly noticed. The numerous cases of recovery from suspended animation, or rather respiration, in instances of suspension, or of hanging, sufficiently attest that death is at first *apparent*, not *real* ; and Dr. Blundell very fairly presumes the same to hold good in cases of asphyxia from the loss of blood ; and to these, in particular, he proposes to resort, to the practice of transfusion. This reasoning and the following circumstance, led him to consider of and to institute a series of experiments upon the subject. He was called to a case of uterine hæmorrhagy, which notwithstanding every exertion on the part of the medical attendants, proved fatal. There were circumstances which gave to the case a peculiar interest, and Dr. Blundell, reflecting upon the operations performed by himself upon animals, as well as some interesting experiments made by his pupil Dr. Leacock, and detailed in his thesis, could not forbear considering, that by the ancient process of transfusion the woman might probably have been saved. The apparatus formerly employed was of such an elaborate and complicated character, that sufficient time could not have been obtained for its perform-



ance, that he thought the vessels might be replenished by the syringe with facility and promptitude. It was not, however, yet ascertained how far blood would be fitted for the purposes of the animal economy, after passing through such an instrument, and he therefore resolved to put the matter to the test of experiment. With this view, he instituted a series of experiments upon dogs, and he satisfactorily proved that the transfusion of blood through the syringe does not unfit it for the animal purposes. Blood taken from the femoral artery was directed into the femoral vein, and this was done during the lengthened period of twenty-four minutes, the blood throughout the whole period rushing from the artery, entering the cup, passing the syringe, and returning to the vein, without the animal sustaining any material injury. It was ascertained that from the femoral artery about half a pint of blood would be discharged in the course of two minutes, and as the artery was allowed to give off its blood during the whole time of the experiment, not less than twelve pints of blood must have been received into the cup, and thence transmitted through the syringe to the vein. The whole weight of the animal did not amount to twelve pounds, hence the same blood must have passed through the syringe repeatedly; and the point therefore as to the fitness of the blood for the purposes of life after passing through the instrument must be considered as perfectly established.

Venous blood, Dr. Blundell has shewn, will revive or resuscitate an animal; a point of great importance as it respects the practice of transfusion in the human species. There is reason, however, to suspect that arterial blood would be more beneficial; but the difficulties which present themselves in obtaining a supply, are too great to be readily overcome. Dr. B. has, however, recommended a recourse to the temporal artery. A few months after the publication of the experiments to which allusion has been made (Sept. 26, 1818,) Dr. B. had an opportunity of transfusing blood into — Brazier, a patient in Guy's Hospital, under the care of Dr. Cholmeley for an incurable scirrhus disease of the pyloric orifice of the stomach. Such a case presents a most unfavourable subject for the treatment; yet the man was dying from inanition, and, to prolong life, he was himself anxious that it should be tried. The transfusion of between twelve and fourteen ounces of blood into the cephalic vein of his arm, in the course of 30 or 40 minutes appears to have produced temporary benefit; his strength was somewhat recruited by it, and his pulse became larger, and the temperature of his body higher. The man stated himself to be revived by it, and to be "better, much better." Yet the operation not being repeated, he again sunk into a state of great exhaustion, and died fifty-six hours after the blood had been supplied. This case served to establish the safety of the operation, and to shew that under other circumstances it might be attended with more

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favourable results; and, in Aug, 1825, Dr. Blundell had the great satisfaction of operating on a woman who was sinking from after-flooding, and on which occasion the operation was crowned with signal success.

The example of Dr. B. has had its influence upon the profession, though not to the extent that might reasonably have been expected. Emboldened by the preceding case, however, Mr. Doubleday operated a short time afterwards, and he has the merit, and the inexpressible gratification, of having been the means of saving by the transfusion of blood the life of a female, who but for its use must have been numbered with the dead, from the consequences of an uterine hæmorrhage. Brandy, laudanum, ammonia, and other stimuli usually employed in such cases, were found to be of no avail. Fourteen ounces of blood were injected from the arm of her husband, and she recovered. The case is circumstantially detailed by Mr. Doubleday, in the *London Medical and Physical Journal* for Nov. 1825. It appears that the pulse, some time previous to the operation, when it could be numbered, was 140, but was now reduced to 104. A quarter of an hour after the operation it was 98, in half an hour 90. The pulse, for the most part, was strong, soft, and full, but somewhat irregular, and continued so for upwards of two hours. At about the expiration of an hour after the blood was injected, she sat up, and assisted the nurse in undressing, and in making herself more comfortable, as if nothing had occurred beyond what is to be observed in ordinary cases!

Acting upon the two successful cases referred to above, Dr. Blundell succeeded in restoring Mrs. B. of Fleet-street, Nov. 10, 1825, from asphyxia, the consequence of uterine hæmorrhage. Twelve ounces of blood taken from the arms of Dr. Uwins and Mr. Wright, her medical attendants, were injected into the venous system. It is now thirteen years since the operation, and the lady is still living.

In 1827, Mr. Brown, a practitioner in Southwark, had a case similar to the preceding. Transfusion was resorted to, and from a state of apparent dissolution she completely recovered. Dr. Blundell does not consider it necessary to inject any large quantity of blood in these cases. The average has not been ascertained; but a small quantity is sufficient to turn the balance in favour of life. He thinks from half a pint to a pint an ample supply in all cases of asphyxia from uterine hæmorrhage. He candidly states, that in nineteen out of twenty cases of this description, transfusion will not be needed; but he boldly maintains that, "under the best and most judicious treatment, and certainly under treatment of average excellence, dissolution may occur, sometimes so suddenly that you have not time to act; more frequently in a gradual manner, so that you see the patient sinking slowly, little by little, into the grave."

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*In some of these cases, life may be restored by transfusion.* It never can be necessary to throw in a quantity of blood equal to that which has been lost; a sufficiency to enable the heart and arteries to control and to support the patient long enough to allow the vessels to accommodate themselves to the quantity in circulation, is all that will be requisite.

Dr. Blundell states, that although the blood of the mammalia may be essentially the same in all the genera, the different kinds of blood differ very importantly from each other. He suggests an inquiry, whether any genus of animals be furnished with a kind of blood congenial to the human veins? From recent experiments made in France, this can hardly be expected to be resolved in the affirmative. The odour of blood is very remarkable, and M. Barruel (*Journal de Science N.S. vi. 187.*) has declared this fluid to contain a volatile principle peculiar to each species of animal. He states this principle to have an odour resembling that of the cutaneous or pulmonary exhalation of the animal, and to serve as a distinctive character by which the blood of different animals may be recognized. This principle is dissolved in the blood, and the odour may be perceived when the blood or its serum is mixed with strong sulphuric acid. The odour is said to be stronger in the male than in the female—in man, to resemble the human perspiration—in the ox, to smell like a cow-house—and in horses, to be similar to their perspiration. This is a subject of curious inquiry, and highly deserving of attention, as it may become an aid in some cases of medical jurisprudence.

A summary of Dr. Blundell's personal experience in transfusion may thus be stated: the operation has been performed *eleven* times by his own hand, ten times in cases of most pressing danger from loss of blood, and once in a case of inanition from scirrhus of the pylorus, and consequent starvation. Of these ten cases, in nine only was there any reasonable prospect of success, one of them being a case in which the patient had ceased to respire five minutes before the first supply of blood was thrown in. Of the nine operations, five failed, and four succeeded. Of the five failures, one might be reasonably imputed to an insufficient supply of blood, six ounces only having been injected; but the other four failures most clearly arose from the insufficiency of the remedy, the patients sinking within half an hour or an hour from the performance of the operation. In all the ten cases, venous blood was employed. In four of the cases of failure Dr. Blundell thinks it highly probable that arterial blood would have been more successful. Of the four cases which succeeded, in three the success was complete, one of the patients being still living, thirteen years after the operation, and the other two he presumes to be living still. The fourth

case was successful in part only; the patient was completely resuscitated, lived for two or three days, and seemed to be doing well, but sank from effusion into the thorax, where extensive old thoracic adhesions were found. In all these four cases the operation was not performed till, with large experience in these matters, he felt that there was no other hope for the patient. Of all the ten cases, in two only did the operation seem to distress; its general effect was cordial; and of these two cases, in one only, where, in his zeal to save the patient, a more than ordinary quantity of blood was injected, was the distress considerable. In the second case, however, the distress was painful to witness. After all his experience, he has assured the writer of this, that, were a friend of his own sinking from the effects of flooding, he would strongly recommend the remedy, and, if to be had, arterial blood.

At the close of each physiological course, Dr. Blundell was in the habit of publishing in the class-room a list of the more interesting problems relative to the animal economy, which had furnished subjects for investigation. Very few of these have been printed, and the notice of some of them cannot but be highly interesting to the physiologist.

1. *On Chylification.*—A set of experiments designed to ascertain whether the bile must mix with the chyme in order that the white chyle may appear. From these experiments it was found,—1. That white chyle does *not* make its appearance when the bile is excluded from the chyme, as, for example, by tying the ductus communis choledochus. 2. That the white chyle *does* make its appearance when the bile mixes with the chyme. These experiments were completed before the commencement of the year 1817, were first published in the class-room a year or two afterwards, and were annually brought forward in the lectures till the course ceased abruptly in 1834, when Dr. Blundell quitted the school. One of the most striking experiments was repeated before his physiological class year after year. Chyme was enclosed in a bag of black silk: fluid from the chyme was then expressed through the pores, and was found not to become white; the bag was then dabbed upon a plate moistened with cystic bile, which it immediately absorbed; the fluid of the chyme was then again pressed through the silk, when it immediately became white: where the bile was, a fixed white stain remained.

2. *On Coagulation of the Blood.*—A set of experiments designed to ascertain the nature of that vascular power which resists the coagulation of the blood. From these experiments it was found, so far as experiments were made,—1st. That whatever destroys the vitality of the vessel destroys also equally the power of resisting coagulation; and, 2d. That whatever does *not* destroy the vitality of the vessel, does not destroy the power of resisting coagulation; whence it was inferred to be *probable* that the power of resisting coagulation is the life in the coats of the vessel, and that this power is exerted by the communication of the vitality to the blood; the latter clause of the conclusion especially being advanced as a probability only. These experiments were brought to a close before the commencement of the year 1818, and, like the former, were published in the class-room annually, in the physiological lectures.

3. *On the Blood as Aliment.*—An experiment designed to shew that the necessity of food may be superseded by supplying blood to the vessels of an animal in a direct manner. In this experiment a dog was sustained for three whole weeks without the help of any food whatever; its drink was water, and its nourishment a few ounces of blood from another dog every day, or every other day, injected into the external jugular vein. The dog never appeared hungry; at the end of the three weeks, though

unwell, it seemed still in no danger of sinking. And, on the whole, the great point of investigation appeared to be in good measure ascertained, namely, that the necessity for eating may be superseded by regular injections of blood into the veins; in other words, that it is possible to live for a length of time without food. This experiment was made in the spring of 1819, in the hope that it might be of use in saving life in cases similar to that of Brazier, the patient who died in Guy's Hospital from the impossibility of retaining and digesting supplies of aliment. The purpose of the experiment is mentioned, to shew that it was not wantonly made. The particulars are to be found in Dr. Blundell's "Researches."

4. *On the Life of the Fœtus.*—Certain observations made to prove that the fœtus *in utero* feels, that it has apparently sensibility, some desire of nourishment, volition, perhaps instinct, and, in a word, that it possesses *in utero* most, if not all, the powers of active life which it enjoys immediately after birth. These observations were made before the year 1820, and were published in the class-room soon after.

5. *On the Coagulability of the Fatal Blood.*—The blood obtained for the purpose was generally taken from the umbilical vein of the funis of the human subject. From these experiments it was found,—1st. That this blood generally coagulates; 2d. That in the main it separates in the ordinary manner into serum and crassamentum; and, 3. That the upper part of the clots exposed to the air brightens, and becomes of a more scarlet arterial colour than the lower; in a word, that in all that is essential, the blood of the human fœtus coagulates like the blood of the human adult. Two curious observations were made in the course of these experiments,—1. That the blood of the fœtus of only seven months obeys the general law, that it coagulates, that it separates the serum, though in sparing quantity, and that the upper surface of the crassamentum brightens on exposure to air; and, 2. That the blood of the nine-months' fœtus sometimes, though rarely, coagulates in appearance only; the serum separating fully, the crassamentum, to the eye at least, forming distinctly in the usual manner, but this apparent crassamentum being destitute of solidity, and falling to pieces immediately under the touch. The last of the experiments was made before the year 1823.

6. *A set of experiments to prove that large ruptures in the body of the bladder may occasionally be cured by laying open the peritoneal cavity, closing the aperture in the bladder by means of a ligature, withdrawing the urine from the cavity of the peritoneum into which the rupture discharges it, and washing out the peritoneum with tepid distilled water.*—In some of these experiments, it was found, that in rabbits one-third of the bladder might be cut away, and that the large aperture remaining might be closed up by ligature; that several of the animals recovered afterwards, and that the bladder of reduced size continued to perform its functions. An eminent surgeon, acting (as he himself told Dr. Blundell) on the principle of these experiments, once tied up an aperture in the stomach, and thereby saved the life of a patient. This fact should be recorded, and the particulars of the case published, as it deserves the candid consideration of those who object altogether to experiments upon animals. The life of the man was here probably saved by the sacrifice of rabbits, which would have been killed to supply his physical wants, had they not thus been rendered subsidiary to the higher office of contributing to his intellectual improvement. The experiments were completed before the year 1823.

7. *On the Power whereby the Muscular Structure of the Heart contracts.*—The experiments were six or seven in number, and in them the heart taken from a dog newly drowned, was laid upon a plate, and a pipe was introduced into the coronary vein, preferred to the arteries on account of its larger capacity, its single trunk, and the opportunity of ascertaining the effect of a reversed circulation. The arterial blood of another dog was then made to circulate through the coronary system of vessels, the blood entering by the vein, which performed the office of an artery, and escaping by the two arteries which performed the office of the vein; the circulation becoming reversed. In one of the experiments only was the circulation fully established, when it continued for more than ten minutes, and the heart, before pale, flaccid, lifeless, and without any visible contraction, became of a full red, firm and active; all the fibres were in a quiver, and, when grasped by the hand, a strong throbbing action of the ventricles, the left especially, might be felt, though the cavities were empty, and the heart was hanging from the tube which supplied it, like an apple from the sprig: the labouring of the ventricles was obvious, but not attended with the full systole and

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diastole which accompany the true circulation of blood. These experiments were completed before the year 1825, (the last was made in October, 1824,) and were published annually in the class-room afterwards. Besides throwing light on various other points of physiology, they go far to prove the superiority of arterial blood for the purposes of restoring the powers of the heart, when failing from flooding, &c.; in other words, the superiority of this blood for the purposes of transfusion.

8. *A set of Experiments designed to refute the erroneous opinion of Barry and others, that the Blood enters the Heart through the great veins during inspiration only.*—One of the most striking of these experiments was made in a diving-bell, at the bottom of the Thames; the atmosphere of the bell being, at the time, nearly of double density. “With a minute watch in my hand, I found that for nearly two minutes together, I could suspend respiration without material distress or disorder of body or mind, the pulse beating all the time in the radial artery with the utmost regularity. Now, as several pints of blood must have passed the heart in the course of the two minutes, allowing only three half ounces for each stroke of the left ventricle, it was clear that several pints must have entered from the veins; and as neither the circulation nor other functions were disturbed during the experiment, it was evident that the blood must have been flowing from the veins into the heart in the usual manner during the whole period, and yet throughout this whole period, the inspiration was completely suspended, whence it follows that the blood flows from the great veins into the heart in the usual manner, without the aid of inspiration.” This experiment was made at the time of the irruption of water into the tunnel, when the first catastrophe occurred, in the year 1827.

9. *Experiments to prove that in Poisoning by nux vomica, and probably other poisons of similar operation, the poisonous dose which destroys life, is not contained in the circulating blood of the animal.*—In three experiments it was found, 1. That if a dog be poisoned with the minimum dose of strychnine sufficient for the purpose, its life cannot be saved by drawing off its blood when the poison is getting into full action, and replenishing it with blood from another and healthy dog. The vessels in some experiments were three times washed out, as it were, by drawing away the poisoned blood from the same animal when under the influence of the poison, and as frequently replenishing it, yet without preserving life. 2. That if a dog be drained of its blood, and replenished from another dog under the influence of the poison, the dog which receives is not poisoned by the blood thrown in, nor does it in general manifest any obvious signs of the presence of the poison: in one experiment, however, characteristic spasms were observed in the dog receiving blood from another dog under the full influence of the strychnine, though even in this case the animal speedily recovered. An interesting observation was made in conducting these experiments, namely, that a dog cannot be poisoned by very large doses of *opium* in its different forms.

From the whole of these experiments it was found, that when an animal is poisoned by strychnine, some of the poison is contained in the circulating blood, but the quantity there contained is not sufficient to destroy life. The poison was inserted by an arrow passed into the muscles of the neck. These experiments were completed before the year 1828.

In the *Lancet* for 1827-8, reports of Dr. Blundell's lectures on Midwifery made their appearance. These were afterwards collected together, arranged, subdivided, and commented upon by Dr. Castle, and in 1834 published under the title of “*The Principles and Practice of Obstetrics.*” This work has acquired a very just celebrity. Dr. B. lectured on Midwifery in the neighbourhood, and afterwards in connexion with, the Medical School of Guy's Hospital, from the year 1816 to 1834; and his withdrawal at this period was a matter of very deep regret to a large body of medical students. The circumstances which induced him to retire from the chair of Midwifery, gave rise to the publication of some pamphlets which reflect no credit on

those who acted in opposition to Dr. Blundell upon this occasion. Dr. B.'s conduct in this affair has been marked by that high sense of honour and independence which should characterize a professional man in such matters. "*Transeat in exemplum.*"

It appears that an attempt was made on the part of the Treasurer or Director of Guy's Hospital, to associate a gentleman with Dr. Blundell in the performance of his duties as a teacher, and that advantage was taken of his absence from England, to advertise this person as a colleague, without the sanction of Dr. B. The Doctor has publicly charged the Treasurer with being "a party to an unwarranted use of his name, under circumstances of deliberate assumption and broken engagement." This conduct will be seen to be most extraordinary when it is made known that the course of Lectures was in its origin private, and established long before the Medical School of Guy's Hospital had an existence. It was purchased by Dr. B.'s labour; illustrated by his private museum; supplied with practice from his private institution, (till the last year or two wholly;) and though annually advertised with the other Hospital lectures, yet, as far as right was concerned, it was advertisable when and where he thought fit. The conduct on the part of the Treasurer induced Dr. Blundell to withdraw his museum from the Hospital, and to conclude his labours as a teacher; a resolution much to be regretted, on account of his great abilities to instruct, and the vast professional acquirements he possesses; but it was a step for which no one can censure, but, on the contrary, must applaud him, for it shews a proper sense of what is due to himself and the honour of the profession.

The Lectures of Dr Blundell display considerable sagacity, and acquaintance with his profession. They shew him to be an intelligent and keen observer; and to be a most faithful reporter, devoid of all prejudices, and anxious to give to every one the merit that is due to them, by the most honest and liberal conduct. The work is divided into five parts: the first two of which relate to the anatomy and physiology of the Female System; the third, to the signs and diseases of Pregnancy; the fourth, to the art of Delivery; and the fifth, to the after-management of the Puerperal State. Upon all these subjects Dr. Blundell communicates the extent of knowledge already acquired, and illustrates it by his own researches and experience. He takes every opportunity of doing justice to the physiological inquiries of his predecessor and relation, Dr. Haighton, one of the best experimenters of his day. Any analysis of the work must be entirely out of the question; it must be referred to, and read, with the greatest care. Of its merits, it is sufficient to observe, that a very competent authority has spoken of it as "a mine of gold—a treasure of literature, science, and practical know-

ledge for the student, which it would be suicidal madness in him to neglect, or fail to have constantly in his possession for reference." (Johnson's Med. Chir. Rev. No. 43.) In the last division of the work, a disease is noticed, of very considerable importance. Dr. Blundell has named it Hidrosis or Hidrotic Fever. There are various types of this disease; the severe ones are dangerous, and the malignant almost uniformly fatal. In its commencement it resembles the puerperal fever, and is ushered in by a shivering or shuddering with a sense of cold more or less severe; the pulse changes in its frequency in a most remarkable manner, rising up from 90 to 140 or 150 suddenly, without any evident cause. Dr. B. observes, that there is not unfrequently a morbid state of the nervous system, which shews itself in a certain quickness of manner, a rapidity of utterance, or a disposition wayward, pettish, or passionate; sometimes, also, the patient becomes the subject of whimsical impulses, either of a comic or tragic character, so that there is an evident tendency to puerperal mania, which may ultimately, though not generally, occur. On the other hand, the patient's manner is now and then marked with a sort of forced coolness, and in some cases there is no very obvious disorder of the nervous system, for these symptoms are not constant."

From the preceding sketch, it will be evident that the career of Dr. Blundell has been one of great assiduity and usefulness, and it is gratifying to add, that his talents and zeal are no less appreciated by the public, than his abilities and integrity are admired by the profession. He has faithfully noted in his "Adversaria" the various physiological experiments he has made, and has accurately minuted the particulars of cases which have been entrusted to his care. It is ardently to be hoped that he will be able to find leisure to arrange these, and submit them to the notice of his profession, and thus confer additional obligations on its members, and contribute to the further advancement of medical knowledge. "Non enim vox illa præceptoris, ut cœna, minus pluribus sufficit; sed ut sol, universis idem lucis calorisque largitur."—*Quintilian*.





H. Bosc.

J. Cochran.