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MEMOIRS

ON THE

GANGLIA AND NERVES

OF THE

UTERUS.

BY

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WITH FIVE ENGRAVINGS.

LONDON:

JOHN CHURCHILL, PRINCES STREET, SOHO.

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MEMOIRS
OF
GANGOLIA AND NERVES

U. M. R. S.

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ROBERT LEE, M.D., F.R.S.

WITH THE ASSISTANCE OF THE LONDON HOSPITAL, AND THE LONDON HOSPITAL FOR THE BLIND, AND THE LONDON HOSPITAL FOR THE DEAF AND DUMB.

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MEMOIRS

ON

THE GANGLIA AND NERVES OF THE UTERUS.

FIRST MEMOIR.

1838—1839.

ON the 3rd of December, 1839, I presented to the Royal Society the following Memoir "on the Nerves of the Gravid Uterus," which was read at a meeting held nine days after:—

On the 6th of April, 1838, a woman, seven months pregnant, died from disease of the heart, in St George's Hospital. In examining the uterus after the veins had been injected, I observed the trunk of a large nerve proceeding upward from the cervix to the body of the uterus, along with the right uterine vein, and sending off branches in its course to the posterior surface of the uterus, some of which accompanied the ramifications of the vein, and others appeared to be inserted into the peritoneum. The trunk of the nerve accompanying the vein passed up close to the ligament of the ovarium, when it became covered with a thin broad band, of a white colour, which resembled a plexus of nerves extending across the posterior surface of the uterus. Another nerve, somewhat smaller in size, likewise passed up along with the right uterine vein, and sent branches along the smaller veins distributed over the anterior part of the uterus.

On the left side of the uterus, a large plexus of nerves was seen surrounding the uterine veins, where they were about to enter the hypogastric vein. From this plexus, three large trunks of nerves were seen accompanying the uterine vein, which appeared to increase in size as they ascended to the fundus of the uterus. From the trunk of the nerve, situated on the posterior surface of the vein, numerous filaments passed off towards the mesial line, as on the right side, some following the smaller veins on the posterior surface of the uterus, and others becoming intimately adherent to the peritoneum. The largest of these nerves accompanying the uterine vein, was traced as high as the part where the Fallopian tube enters the uterus, and there it divided into numerous filaments, which plunged deep into the muscular coat of the uterus along with the vein.

A large broad fasciculated band, like a plexus of nerves, was also seen on the left side under the peritoneum, crossing the body of the uterus, and several branches, apparently nervous, from this band, were distinctly continuous with some of the smaller branches of the nerves accompanying the uterine veins.

After displaying the hypogastric nerves, and the fasciculated bands connected with them on the posterior surface of the uterus, I placed the preparation in the Museum of St. George's Hospital, on the 1st of October, 1838, where it has remained ever since, and has been seen by many gentlemen who have visited the Museum.

Several anatomists to whom I showed the preparation, thought that I had been misled by appearances, and that they were absorbent vessels, and tendinous fibres, which I had described as the enlarged nerves of the gravid uterus in the seventh month of pregnancy, accompanying the uterine veins, and spread out upon the posterior surface of the uterus. The peculiar flat appearance of the bands, the direction in which they extended, and their intimate union with the peritoneum, seemed to favour this opinion. The evident continuity of their branches, however, with the branches of the hypogastric nerves, prevented me from

adopting this conclusion, and I resolved, when another opportunity should present, to examine the gravid uterus with the utmost care, that I might discover, if possible, the nature of these structures.

On the 16th of December, 1838, a woman, in the sixth month of pregnancy, died in St. George's Hospital, from an external injury, the fœtus and its appendages having been expelled a few hours before death. The uterus was removed with the hypogastric, spermatic, and sacral nerves. During the last ten months, I have been engaged in tracing the nerves of this uterus, and have succeeded, I believe, in ascertaining, that the principal trunks of the hypogastric and spermatic nerves accompany the veins, and not the arteries of the uterus; that these nerves become greatly enlarged during pregnancy; and that their branches are actually incorporated with the branches of four great fasciculated bands, on the anterior and posterior surfaces of the uterus, which bear a striking resemblance to ganglionic plexuses of nerves, and send numerous branches to the muscular coat of the uterus. The following is a concise description of the nerves of the gravid uterus in the sixth month, as displayed in this dissection:—

Behind the uterus, the aortic plexus divides into two portions, to form the right and left hypogastric plexuses. These plexuses, after forming an intimate union with the nerves accompanying the ureters, descend to the neck of the uterus, upper part of the vagina, and contiguous parts of the bladder and rectum, where they are joined by branches from the third and fourth sacral nerves.

The left hypogastric plexus, about two inches below the aortic plexus, sends off a large branch, which passes on the inside of the ureter to the superior uterine vein, where it is about to terminate in the hypogastric vein. Here the nerve suddenly expands, becomes broad and thin, and passes into a great plexus of nerves, which completely encircles the vein. This plexus, surrounding the uterine vein, is joined below by two large branches, which proceed from the hypogastric plexus, nearer the vagina, lower down, and which branches pass on the outside of the ureter. From the upper part of this plexus surrounding the uterine vein near its termination, three large trunks of nerves proceed upward with the vein to the superior part of the uterus, which enlarge as they ascend. The posterior branch of these hypogastric nerves sends off smaller branches in its course, which accompany the ramifications of the uterine vein on the posterior surface of the uterus. Passing upward beyond the junction of the spermatic with the uterine vein, and running between the peritoneum and the left posterior fasciculated band, it spreads out into a web, of thin broad branches, and slender nervous filaments, some of which are inserted into the peritoneum, and others follow the vein to the fundus uteri, and completely surround it, as the vein passes down into the muscular coat of the uterus. Some of the branches of this nerve, near the fundus uteri, are distributed to the muscular coat, but these are small, and few in number.

The middle and anterior branches of the left hypogastric nerves adhere closely to the uterine vein as they ascend, and form around it several plexuses, which completely invest the vessel. From these plexuses branches are sent off to the anterior surface of the uterus, some of which, in an arborescent form, follow the trunk and branches of the uterine artery. These two uterine nerves ascend, and closely unite with the left posterior fasciculated band.

On the left side of the uterus, this band arises near the mesial line, on the back of the uterus, midway between the fundus and cervix, from a mass of fibres, which adhere so firmly both to the peritoneum and muscular coat, that it is difficult precisely to determine their arrangement. From these fibres the band proceeds across the uterus, in the form of a thin web, to the point where the spermatic vein is leaving the uterus. After closely uniting with the hypogastric nerves, this band proceeds outward to the round ligament, becoming less firmly adherent to the peritoneum, where it unites with the left anterior band, and spreads out into a great web, under the peritoneum. The left posterior band is loosely attached through its whole course to the subjacent muscular coat, by soft cellular membrane.

The spermatic nerves on the left side pass down to the ovary with the spermatic artery, and first give off several branches to the corpus fimbriatum. A few small branches are then sent into the outer end of the ovary. The spermatic nerves afterwards leave the artery, and proceed with the veins to the uterus, where they firmly unite to the outer extremity of the left posterior band, and after the junction of this band with the

prolongations of the anterior band under the round ligament, numerous small delicate filaments, apparently nervous, are sent to the base of the ovarium.

On the right side of the uterus, the distribution of the hypogastric and spermatic nerves does not essentially differ from that now described as seen on the left side. From the right hypogastric plexus, branches are likewise sent off to the uterine veins, near their termination in the hypogastric vein, and a great plexus of thin broad nerves likewise surrounds the veins at this point. From the upper part of this plexus a large branch is sent off, which passes perpendicularly upward upon the posterior surface of the uterus, and the branches of which are continuous with branches sent down from the inferior margin of the right posterior fasciculated band. Several large trunks of nerves pass up along the body of the uterus with the uterine vein, which are likewise sent off from the upper part of the plexus surrounding this vein. These uterine nerves, both above and below the right posterior band, are, at different points, evidently continued into the branches sent off from the superior and inferior margins of this band. From the margin of the anterior band, two thin, broad, lesser bands, like nerves, pass over to join the hypogastric nerves.

The spermatic nerves, as on the left side, first send branches to the Fallopian tube and outer extremity of the ovarium, and then pass down parallel to the base of the ovarium, till they reach the uterus, where they become firmly united with, or lost in, the posterior band crossing the uterus. After the two bands have become united under the round ligament, numerous small filaments, apparently nervous, are sent to the ovarium.

The form and situation of the right posterior band is much more clearly displayed than on the left side. It presents the appearance of a white, pearly, fasciculated membrane, about a quarter of an inch in breadth, proceeding from the mesial line at right angles to the hypogastric nerves, across the body of the uterus, to the round ligament, where it unites with the anterior band. Numerous branches, strikingly resembling the branches of nerves, are sent off from the upper and lower edges of this band, and from its posterior surface to the muscular coat of the uterus. An extensive and intimate union, at various points, is distinctly perceptible between these branches sent off from the band and the branches of the hypogastric nerves.

On the anterior and upper part of the cervix uteri there is a great mass of reddish-coloured fibres, firmly interlaced together, resembling a ganglion of nerves, into which numerous large branches of the hypogastric nerves on both sides enter, and to which they firmly adhere. From the upper part of this fibrous substance, there passes up over the whole anterior surface of the uterus, a thin band of firm, white, fasciculated fibres, prolongations of which extend to the round ligaments, into which and the posterior band they are continued by numerous filaments, like those of nerves. From the posterior surface of this great band numerous branches, also apparently nervous, can be traced to a considerable depth through the muscular coat of the uterus.

The manner in which the hypogastric and spermatic nerves are distributed to the uterus on the right side, and the situation and appearance of the fasciculated bands, have been represented in the accompanying drawing. This drawing is now suspended in the Museum of St. George's Hospital.

From the form, colour, and general appearance of these fasciculated bands, and the resemblance they bear to ganglionic plexuses of nerves, and from their branches actually coalescing, and being continuous, with the hypogastric and spermatic nerves, I was induced to conclude, on first discovering them, that they were nervous chronic plexuses, and formed the special nervous system of the uterus. The recent examination, however, of the gravid uterus of some of the lower animals, in which I have found a structure similar to these bands, in large quantity, under the peritoneum, has left me in considerable doubt as to the nature of these bands, and until further investigations have been made, it is impossible for me to pronounce a positive opinion respecting them.

The description of the nerves of the uterus contained in Professor Tiedemann's splendid work, is usually referred to by anatomical writers as the most accurate and complete which has yet appeared. Professor Tiedemann has represented the spermatic nerves as distributed chiefly to the ovarium, and the hypogastric as invariably accompanying the trunk and branches of the uterine arteries, along the sides of the uterus, dividing

into smaller branches, and disappearing in the muscular coat of the uterus. Professor Tiedemann has made no mention of the large trunks on both sides of the uterus which accompany the uterine veins, nor has he noticed the fasciculated transverse bands on the anterior and posterior surfaces of the uterus continuous with the hypogastric and spermatic nerves.

In a gravid uterus of nine months, presented to me on the 11th of December, 1839,—the day before the preceding Memoir was read to the Royal Society,—by Mr. Potter, of Cadogan Place, I found the distribution of the spermatic, hypogastric, and sacral nerves to be similar to that observed in the last dissection. Both hypogastric plexuses were greatly enlarged. Numerous branches were sent off from these to the blood-vessels and muscular coat of the uterus, both on the anterior and posterior surfaces of the uterus. Behind, on the right side, many small branches were given off from the hypogastric plexus, which spread out into a great web under the peritoneum, and adhered to its inner surface. These branches extended to a thin band, which passed upward near the mesial line, from the cervix to the body of the uterus. To this longitudinal band the peritoneum firmly adhered, but on each side of this, over the whole of the lower part of the uterus, the peritoneum was separated from the muscular coat by a layer of soft cellular membrane. From the right side of the longitudinal band, numerous smooth, flat fibres, interlaced together like the branches of a nervous plexus, passed off and extended across the body of the uterus towards the spermatic and uterine blood-vessels. When the cellular membrane in which these were imbedded was removed, it was observed that most of the fibres converged to a point about midway from the longitudinal band to the uterine bloodvessels, and were joined by branches of nerves proceeding upward along the posterior part of the neck and body, from the hypogastric plexus. At this central point, an interlacement was formed of the fibres of this great plexus, precisely similar to what takes place in other plexuses of the great sympathetic. A large branch, accompanied with a tortuous artery, proceeded from this central point toward the spermatic vessels, and anastomosed with the spermatic nerves. Other branches of this great transverse plexus, accompanied with arteries, passed outward, and united with the nerves accompanying the uterine arteries and veins, and others were continued to the anterior surface of the uterus, and entered a great plexus there situated under the peritoneum, and some of the branches of which passed out with the round ligament. At the upper border of the great transverse plexus, the peritoneum was firmly adherent to the muscular coat, and had no layer of cellular membrane interposed, as in the lower part of the uterus. The plexus here became so strongly attached to the peritoneum and muscular coat, that it could not be separated, though it could still be distinguished from these by the peculiar colour and distribution of its fibres. On the left side, proceeding from the longitudinal band, numerous flat fibres are also seen, which have a plexiform appearance, and which pass round to the front of the uterus, where there is a great plexus of nerves under the peritoneum. From every part of these plexuses on the body of the uterus, branches were seen passing between the fibres of the muscular coat of the uterus, and like branches of nerves, in other muscular organs, dividing into smaller branches as they enter.

In October, 1838, I first examined the nerves of an unimpregnated uterus. It was taken from the body of a woman beyond the middle period of life. The aortic plexus, the hypogastric nerves and plexuses, were all much smaller than in any of the gravid uteri I had previously seen. From the fore and middle part of the left hypogastric plexus, a small branch passed down on the inside of the ureter to the trunk of the uterine artery and vein, which was surrounded with a plexus of nerves as in the gravid uteri above described. From this, branches passed upward to the fundus uteri, and a communication between these and the spermatic nerves was quite evident. From the left hypogastric plexus numerous branches also passed directly into the uterus, without entering the ganglion at the cervix, which ramified under the peritoneum behind, and in the muscular coat. Branches from the posterior part of the hypogastric plexus communicated with some branches of the sacral nerves behind the ganglion. The trunk of the left hypogastric nerve was easily traced through the plexus to the upper part of a ganglion, which was remarkably large and distinct, and consisted of white and grey matter. Into the posterior part of this ganglion, the third sacral nerve sent numerous small

branches. From the anterior margin of the ganglion, a broad band of white and grey nerves passed round the outer surface of the ureter, and after uniting with a similar band on the inside, sent branches to the plexus, surrounding the uterine artery and vein, and also branches to the anterior surface of the uterus. Large flat nerves were seen passing off from the anterior border of the ganglion to the bladder and vagina, and from its inferior and posterior borders to the vagina and rectum. A great number of nerves likewise passed off from the inner surface of the ganglion into the cervix uteri. The nerves sent off from the ganglion were both larger and more numerous than those which entered it. A great web of nerves was seen under the peritoneum, both on the anterior and posterior surface of the uterus, intimately connected with the nerves sent off by the ganglion and the hypogastric plexuses.

Sir Astley Cooper, Sir B. Brodie, Professors Mayo and Owen, were members of the Committee of Physiology of the Royal Society, when the above Memoir was presented. This committee was first appointed by the Council about twelve years ago, and ever since most of the Papers on anatomy and physiology communicated to the Society have been referred to it, to report upon them, as to their fitness for publication in the "Philosophical Transactions." In the adjudication of Royal medals in physiology, during the last twelve years, and several Copley medals, the recommendation of this committee has almost invariably been adopted by the Council. By this system the most important functions of the Council have been delegated or transferred to this secret committee since 1837. The names of the referees on Papers have generally been concealed, and the grounds upon which they have decided respecting the rejection or publication of Papers, have not been revealed to their authors, who have no right to request that the grounds may be assigned. Before communicating this Memoir to the Royal Society, I requested Sir Astley Cooper, then president or chairman of this secret committee, to examine my dissections, now described, and give an opinion respecting them. He readily complied with this request, but saw them only once, in a dark, foggy morning, down stairs, with the light of two small candles, in Conduit-street. In making the dissections, I found that the bright light of the sun was required in the summer mornings. He admitted that the great plexuses at the cervix and on the body of the uterus were continuous with the sympathetic and spinal nerves, and that they had all the character of ganglionic plexuses of nerves. But Sir Astley would not admit them to be true nervous structures, because he believed in the truth of the unsupported assertion of Mr. J. Hunter, that the nerves of the uterus never enlarge in the slightest degree during pregnancy, and because he thought that nerves never enlarged in any part of the body under any circumstances. He considered the new structures displayed to be expansions of peritoneum, and bands of elastic tissue, similar to those which he said he had observed on the surface of the testis, and which for a time he supposed to be nerves. Sir Astley jocularly called the ganglionic plexuses covering the uterus "the cart ropes and chain cables" of the organ. Several foreign anatomists were sent by him to look at these cart ropes and chain cables, but they all returned to report that they were nerves, and that they had never before seen them displayed by any anatomist, in Germany, France, or Italy. Sir Astley entreated me to send no Paper to the Royal Society on the subject, and he was somewhat offended because I did not follow his advice. In the last letter I ever received from him he expressed the kindest feelings to me, and showed that the offence had been fully forgiven.

"MY DEAR SIR,

"39, CONDUIT STREET, August 17, 1840.

"I am desired to express to you the sincere thanks of the ladies at ———: they declare that they never witnessed so much kindness, coolness, delicacy, compassionate feeling, tenderness, and deliberation, as you displayed in the exercise of your profession on Saturday, &c. &c. Wishing you joy of your success,

"Believe me, always yours truly,

"ASTLEY COOPER.

"I shall call upon you very soon, to make up my mind upon your *nerves*, and shall be most happy to be convinced."

Sir Astley Cooper died on the 12th of February, 1841, without having had an opportunity of re-examining the dissections.

On the 20th October, 1839, Sir B. Brodie, with Mr. Tatum and Mr. H. C. Johnson, examined the dissections described in the Memoir, and they had no doubt that the new structures displayed were nervous. Mr. Cæsar Hawkins, on the 18th, had expressed the same opinion. Professor Partridge, of King's College, saw the preparations, and the "impression," he says, "made upon my mind at the time, by your demonstrations, was, that the structures were ganglia and nerves." Professor Owen at first thought that they were nerves, but he changed this opinion. Mr. Joseph Swan also examined the dissections twice, carefully, and expressed his conviction that the structures displayed were nerves, and he thought them so interesting in a physiological point of view, that an account of them should be sent to the Royal Society, and he consented to write the description. He afterwards changed his opinion also, and the doubt about these structures inserted near the close of the Memoir, was introduced in compliance with his request, which I have ever since regretted having done. Professor Mayo, of King's College, very carefully examined the dissection of the gravid uterus of six months, and he communicated in the following letter his opinion respecting it to me:—

MY DEAR SIR,

"19, GEORGE STREET, HANOVER SQUARE, November 24, 1839.

"Agreeably with your request, I write to you my impression as to the points of anatomical structure displayed in the dissection of an uterus at the sixth month of pregnancy, which you gave me this morning an opportunity of examining. You have made out the existence of a thin band of firm, white, fasciculated substance, of some breadth, situated at the lower and anterior part of the uterus, prolongations of which extend from thence to the round ligaments, into which they are continued by numerous filaments. To the same parts you have traced the production of a smaller narrow band, that is disposed transversely across the middle of the posterior surface of the uterus, and with the fasciculated terminations of which the prolongations of the anterior band are joined by other filaments. These bands adhere firmly to the peritoneum, and filaments pass from them into that membrane. Larger and more numerous filaments pass from them into the fibrous structure of the uterus, to which the bands themselves adhere as firmly as to the peritoneum. Filaments of the spermatic nerves are distinctly continuous with some of the filaments existing at the junction of the two bands behind the uterine ends of the Fallopian tubes. Filaments of the lateral uterine nerves are distinctly continuous with the anterior band above mentioned, and with its production upon the side of the uterus. Tiedemann has either disregarded or overlooked the structure which you have displayed. I have no doubt that he overlooked it, considering that he has likewise overlooked the large anterior lateral uterine nerves which you have additionally discovered, and have shown to proceed from the lateral uterine plexuses derived from the hypogastric plexuses and sacral nerves to contribute to the supply of the fibrous texture of the uterus, and to coalesce by filaments with the system first mentioned. I am the more surprised that Tiedemann should have overlooked these nerves, as the filaments which he observed and delineated in his Plates appear incommensurate with the size of the plexus from which they proceed: his oversight must have arisen from his following those filaments only which go with the uterine arteries; the great branches which you have shown, accompany the uterine veins.

"The reasons which suggest themselves against considering the fasciculated bands which you have displayed in the uterus to be parts of the nervous system, are, their firmness of texture and incorporation with the peritoneum. But neither of these circumstances appears to me equal in weight to the facts of the continuity of filaments of the spermatic and hypogastric nerves with the bands, and of the production of filaments, after the manner of nerves, from the bands into the substance of the uterus: facts which strongly favour the opinion that these bands are nerves, plexuses, or ganglia, and that they form the special uterine nervous system.

"I am myself inclined to adopt the latter opinion, and believe that I may safely congratulate you on a discovery of great anatomical and physiological interest. I remain, dear Sir, yours sincerely,

"To Dr. ROBERT LEE, F.R.S."

"HERBERT MAYO."

This letter was enclosed in an envelope, with the following note from Mr. Mayo:—"I enclose an *official* note to you, to append, if you think fit, to your Paper. If I have made any mistake, tell me, that I may set it right. I have made none in viewing your discovery as *genuine*, interesting, and important, and calculated to make up your *lee-way* to the honours of a first-rate anatomist."

I received the following letter, from Mr. Mayo, five days after:—"Mr. Tomes, the house-surgeon of the Middlesex Hospital, has one of Powell's finest microscopes, and he is himself well known, through his researches on the teeth, as a good microscopical observer. He is likewise well versed in the appearance of nerves in the microscope. I have begged him to be at home at the hospital, on Sunday, at half-past one, in the hope that you will be able to meet me there at that hour, with your preparation, which I examined. If the microscopic examination is satisfactory, no room for doubt will be left. Mr. Tomes assures me that the microscopic characters of the nerves are quite identifiable."

Mr. Tomes examined portions of the ganglionic plexuses under the peritoneum, both of the unimpregnated and gravid uterus, with the microscope, but he declined giving any opinion respecting them. He thought that a lengthened inquiry on recent specimens of nerves was essentially necessary to arrive at a just conclusion respecting the structures displayed in my dissections. Mr. Tomes has since informed me that at the time he made this microscopic examination of the uterine nerves, he was almost entirely unacquainted with the microscopic characters of nerves, his attention previously having been wholly confined to the structure of teeth and bone. Mr. Mayo was equally unprepared for such a delicate investigation with the microscope, but the same night he requested that his official letter to the Council of the Royal Society should be returned to him, and urged me, in the strongest terms, not to send the Paper to the Royal Society—a recommendation with which I could not comply.

The referees appointed by the Committee of Physiology to examine and report on the Paper, as to its fitness for publication in the "Philosophical Transactions," were, Professor Owen and Mr. Kiernan. After a very brief examination, with the microscope, of small portions of the plexuses under the peritoneum, which had long been immersed in alcohol, and consequently unfit for such an examination, they decided, in the most positive manner, that they were not nervous plexuses. The evidence furnished by the actual continuity of these structures with the great sympathetic and spinal nerves, their vascularity, and their plexiform appearance, were considered by them of no weight compared with the microscopic appearances. The microscope alone, Mr. Kiernan affirmed, could decide the question whether these structures were or were not nervous. At the time, the referees assigned no grounds for their decision, and they were not bound to assign any grounds. The verdict was pronounced in a manner so unhesitating, that for a short time I was almost tempted to disbelieve the evidence of my senses, and to conclude that the most sensitive and powerful muscular organ in the human body had no nerves, and that sensibility and contractile power did not depend upon nervous influence. The phenomena of human parturition—the pains of labour, and the innumerable local and sympathetic affections of the uterus, which I daily witnessed—again forced on me the conviction, in spite of this decision, which had been so hastily pronounced, without any grounds being assigned, that the new structures displayed really were great nervous centres in the uterus—the chief source of its sensitive and contractile power—and that the existence might be denied, with equal reason, not only of the whole sympathetic nervous system, but of all the nerves of the human body. I could not forget that all the different parts of the nervous system, sympathetic and spinal, had been discovered ages before the invention of the microscope, and that the microscope had never before been employed in such an inquiry, and to throw doubt upon the evidence which had been universally received since anatomy had been first cultivated as a science. The undisputed continuity of the new structures with the sympathetic and spinal nerves, their form, colour, and vascularity, rendered it impossible that they could be bands of elastic tissue, expansions of the peritoneum, or modifications of cellular membrane, or any kind of fibrous matter not nervous. If they were not ganglia and nerves, then it followed that the uterus had no nervous system.

The Paper was withdrawn by me from the Royal Society, and I continued the investigation with increased vigour.

SECOND MEMOIR.

1840—1841.

ON the 27th of June, 1840, I examined the uterus of a woman who died suddenly on the tenth day after delivery. The hypogastric plexuses, and those both on the anterior and posterior surfaces of the body of the uterus, were very much reduced in size from what they were observed to be in the uteri of six and nine months. This observation made it certain that the nerves of the uterus having performed their function during gestation, and in labour, gradually return to the condition in which they are found in the unimpregnated state.

On the 12th of September, 1840, I enjoyed another opportunity of examining the nerves of the uterus at the end of the ninth month. The fœtus and its appendages had been expelled a short time before death. The spermatic nerves on both sides passed off from the renal plexus, and after accompanying the spermatic arteries for about two inches, several considerable branches left these vessels and passed to the veins which they surrounded and followed to the uterus. The absorbents on the right side were seen covered with filaments of nerves. The aortic plexus, and the hypogastric nerves and plexuses, presented the same appearance as in the last dissection of the gravid uterus at the full period, and were larger than in the uterus of six months. Branches were seen proceeding from the anterior part of each hypogastric plexus to the corresponding ureter, the uterine artery and vein, and to the neck and body of the uterus, as above described. The trunk of each hypogastric nerve was prolonged through the middle of the plexus to the ganglion at the cervix, into which the second, third, and fourth sacral nerves sent branches. Between the posterior part of each hypogastric plexus and the sacral nerves there were communicating branches which did not enter the ganglion. The ganglion on each side was situated close to the neck of the uterus, a little behind the ureter, near its termination in the bladder. The ganglia at the cervix appeared to be more expanded than in the former dissections, and a great communication was formed between the numerous small soft nerves passing from their inner surface and the great plexuses on the body of the uterus. From each ganglion branches spread out under the peritoneum, both of the anterior and posterior surfaces of the uterus, and many were seen plunging into the muscular coat at the cervix, and others passing up with the bloodvessels to the fundus uteri. The ureters were also observed to be surrounded with nerves from the ganglia, and many branches passed from them to the sides of the bladder, vagina, and rectum. The upper borders of the great plexuses on the body of the uterus behind, were traced to a considerable depth, passing in the cellular membrane between the layers of the muscular coat of the fundus uteri, which I did not perceive in the former dissection of the uterus in the ninth month. Several trunks of absorbents on the sides of the body of the uterus were supplied with nervous filaments. The most striking circumstance observed in this dissection was the direct continuity at numerous points between the branches proceeding from the hypogastric plexuses and ganglia at the cervix, and the branches of the great transverse plexuses on the body of the uterus behind. In the previous examination of the uterus, I had never before observed filaments of nerves ramifying on the coats of absorbents. I have since seen this in the gravid uterus of the cow, and in the human spermatic cord, at a short distance from the testicle. Analogy led me to suspect that many branches of nerves would also be found, on examination, to accompany the veins of the spermatic cord, and to ramify upon their coats. The late Mr. James Dunn undertook, at my request, to ascertain if this were the fact, and in July, 1840, he made three preparations, in which the nerves are seen covering the veins, as they pass out of the testicle.

In October, 1840, I completed the dissection of a gravid uterus of four months, all the arteries and veins of the right side of which are filled with red and blue injection, and the whole nervous system more perfectly displayed than in any of the preparations already described. The uterus was removed from the body of a woman, who died in St. George's Hospital, from an external injury, and the fœtus and its appendages were expelled a few hours before death. The nerves were traced while covered with rectified spirit. An artery of considerable size, filled with injection, is seen accompanying the right hypogastric nerve, and passing along

with its branches through the hypogastric plexus to the ganglion at the cervix. In this course, the artery is seen ramifying upon the trunk of the hypogastric nerve, and the most minute branches of the hypogastric plexus. The sacral nerves passing into the ganglion are also accompanied with an artery, which is likewise injected, and which passes through the centre of the ganglion. These nerves are a little smaller than in the uteri of nine months. The ganglion is thick, large, and distinct, of an oblong form, about three quarters of an inch in diameter, and consisting of grey and white matter. From its inferior border, three large bundles or masses of nervous fibres are sent off, which present an appearance, resembling the *pes anserinus* of the *portio dura*. The posterior of these divides, and subdivides, into numerous small branches, accompanied with arteries which supply the rectum and back part of the vagina. The middle of these great nerves proceeding from the ganglion, likewise accompanied with arteries, ramifies upon the side of the vagina; and the anterior upon the bladder around the entrance of the ureter.

From the hypogastric plexus, before it enters the ganglion, and from the inner surface of the ganglion, numerous large and small branches of nerves are given off to the neck of the uterus, some of which accompany the bloodvessels towards the fundus, and others spread out under the peritoneum. All these are likewise accompanied by injected arteries. From the inner border of the ganglion, a broad nervous band is sent off, which passes on the outside of the ureter, and another on the inside, which unite and completely surround the ureter. From these united nervous bands, many large branches are sent to the back part of the bladder, and into the anterior part of the cervix uteri. The course of these branches can easily be traced by their injected arteries. On the lower and anterior part of the cervix uteri, over the mesial line, there is a thick, membranous expansion, into which these nerves enter from both hypogastric ganglia and plexuses. From the sides and upper part of this membrane, there are given off innumerable filaments, apparently nervous, which unite on the sides of the uterus with the nerves accompanying the bloodvessels, and with the spermatic nerves, and some of which pass out with the round ligaments. These are likewise accompanied with minute arteries, as are all the nerves on the right side of the uterus, entering the ganglion, and passing out from it.

The nerves and ganglion on the left side correspond, in appearance, with those of the right, and the greater number of the spermatic nerves on both sides accompany the spermatic veins. I had never before seen the arteries of the nerves of the uterus injected, or suspected that they had concomitant arteries which enlarged along with them during pregnancy.

About the same time, I examined the uterus of a woman who died at the end of the third month of pregnancy from an extensive burn. The contents of the uterus were also expelled some hours before she died. All the veins are filled with blue injection, and the distribution of the nerves on the left side and anterior surface is clearly seen. The left hypogastric and sacral nerves enter the ganglion, which is fully as large and distinct as in the last dissection. Something like the *pes anserinus* of the *portio dura* is here also observable, and the bands surrounding the ureter, and uniting on its inner surface, are large, and consist of several distinct filaments of nerves. After the union of these bands, they appear to enlarge, and to form a flat mass of nervous matter, like a ganglion, on the anterior surface of the neck of the uterus. From this, branches are seen passing outward to join the branches which accompany the uterine arteries and veins; other branches pass inward towards the mesial line, where a membranous expansion is also seen, which they enter, and from which a great plexus is sent off, which has all the characters of a true nervous plexus, and covers the whole of the anterior and lower part of the uterus. The branches of this great plexus form an extensive and intimate union at various points with the nerves accompanying the uterine vessels, and with the spermatic nerves, and branches apparently nervous are sent out from it with the round ligaments. On the right side the same appearances are seen.

In the summer of 1840, the late Mr. James Dunn made a dissection for me of the nerves of the uterus of a young woman who died in St. George's Hospital, and who had never been pregnant. The aorta, vena cava, and all the arteries and veins connected with the uterus, have been injected. The uterus is of the ordinary size. The spermatic nerves on both sides are given off mainly by the renal plexus. The greater number of

these nerves are distributed upon the veins. Branches are sent to the Fallopian tubes and ovaria, and others pass down to the uterus, and can be distinctly traced into the great transverse ganglionic plexuses, under the peritoneum. The aortic plexus, hypogastric nerves, and plexuses, are considerably larger than in the unimpregnated uterus, which I dissected in 1838, and from other dissections since made, it appears that the ganglia and nerves of the uterus are much larger in some individuals than in others. The arteries of these nerves and plexuses have been successfully injected, and it is evident that they are much smaller than the arteries in the gravid uterus at the fourth month. The ganglia are large and distinct, and the branches sent off to the bladder, vagina, and rectum, are all accompanied by arteries filled with injection. Numerous branches of nerves are seen accompanying the uterine bloodvessels to the fundus, and the plexuses on the body of the uterus, before and behind, are continuous with the branches proceeding from the hypogastric plexuses and the ganglia at the cervix.

During 1840, I made dissections of the nerves of the unimpregnated and gravid uterus in several of the larger quadrupeds, especially in the mare and the cow. In consequence of the uteri of these quadrupeds being bicorned, and the nerves being much larger and harder than in the human subject, and resolved into two almost distinct systems, the dissection of the uterine nerves in quadrupeds I found an easy task, and magnifying powers not required, although alcohol was equally so, as in all the dissections of the nerves of the human uterus above described. If the ganglia and nerves of the unimpregnated uterus of the mare or the cow be compared with the ganglia and nerves of the gravid uterus in them, the conclusion is unavoidable that the nervous, vascular, absorbent, and muscular systems of the uterus all enlarge together during pregnancy.

The following is the description which I gave in 1840 of the ganglia and nerves of the uterus of the mare from the dissections I had then made. There are two dense oblong ganglia in the mare, situated on the sides of the aorta, a few lines above its bifurcation. The two cords of the great sympathetic nerve terminate in the superior extremities of these aortic ganglia, which are connected together by two branches of nerves, which pass across the front of the aorta from their inner borders. Each ganglion sends off a branch from its outer border to join the spermatic nerves. From the inferior ends of these ganglia are given off the hypogastric nerves, and the nerves which supply the cornua of the uterus.

The left hypogastric nerve proceeds downward from the left aortic ganglion between the folds of the broad ligament, by the side of the uterus, to the cervix, where it terminates in the hypogastric plexuses. This nerve is at first much larger than the nerve of the cornu, and appears to be a continuation of the ganglion, and in its course it has two distinct ganglionic enlargements. The first of these is three inches from the aortic ganglion, and the second more than two inches lower down, and from both of these ganglionic enlargements, several large and small branches are sent off to unite with the nerve of the left cornu, and with the plexus of nerves accompanying the trunk of the uterine artery.

The *nerve of the left cornu*, soon after being given off by the aortic ganglion, divides into two branches, which again unite at a distance of three inches from the ganglion, and form one nerve. This nerve suddenly expands into a firm, round, elongated ganglion, which resembles the bulbous root of a plant. On leaving this ganglion, the nerve is enlarged to more than double the size it is on entering the ganglion, and it proceeds without any considerable diminution for four inches, to the uterine artery, with the branches of which it ramifies upon the upper part of the body of the uterus, and the whole cornu. Numerous small filaments are given off from the nerve in its course, with the artery to the peritoneum and muscular coat, and it forms a great plexus of nerves, which not only surrounds the branches of the artery, but the veins and absorbents. On the nerve of the right cornu of the uterus, a round elongated ganglion is also formed, about the same distance from its origin, and the nerve passes out of the ganglion much increased in size, and is distributed to the body of the uterus and cornu, as on the left side.

From each hypogastric plexus there are sent off to the body and neck of the uterus many large nerves, which have a very peculiar serpentine or undulated appearance. They proceed between the folds of the broad ligaments to the anterior and posterior surfaces of the uterus, and after sending numerous branches to the peritoneum, they penetrate the muscular coat, and can easily be traced ramifying upon it on to the cornua.

The greater number of these nerves are found on the anterior surface of the uterus, where they form an immense plexus in the muscular coat, and where they can be seen as they cross the arteries, anastomosing with the branches of the nerves of the cornua. At the cervix, these nerves can easily be traced through the muscular coat to the lining membrane of the uterus, under which they form a beautiful nervous web. These great nerves in the uterus of the mare resemble, in their origin and distribution, the ganglionic plexuses in the human uterus above described, which I regard as the muscular nerves of the organ. The aortic ganglia in the mare correspond with the aortic plexus in the human subject, and the nerves of the cornua with the branches of the hypogastric plexuses, which pass down between the uterus and ureters, to the trunks of the uterine artery and vein, with the branches of which they ramify on the body and fundus of the uterus.

Since the above description was given, I have prosecuted these dissections of the uterine nerves in the mare much farther, and have ascertained that there are distinct ganglia formed on the spermatic nerves in their course,—that there are ganglia formed on these nerves where they are about to enter, and after they have entered the substance of the ovaria—and that ganglia and nerves are largely supplied to the bloodvessels, Graafian vesicles, and stroma of these organs. I can now demonstrate that every artery in the walls of the uterus of the mare, even the most minute, to the lining membrane, is accompanied with nerves, and that the whole muscular structure is pervaded with ganglia and nerves.

On the 1st January, 1841, a description was published of all the dissections referred to in this and the preceding Memoirs, with two plates representing the nerves of the uterus in the sixth and ninth months of pregnancy. Before the publication of this description, which was entitled, "The Anatomy of the Nerves of the Uterus," the ten dissections were examined by all the anatomists, physiologists, and medical practitioners, whom I could prevail upon to do so, and to express their opinions respecting them.

On the 28th of February, 1840, Dr. Hake, of Bury St. Edmunds, examined with the compound microscope portions of the plexuses of the gravid uterus under the peritoneum, and compared them with portions of undoubted nervous structures—the hypogastric plexuses. He assured me that he could discover no difference whatever between them. Dr. Hake said, that these plexuses under the peritoneum he considered to be nerves, for the following reason:—"There is continuity of substance with the spermatic and hypogastric nerves,—there is a similar mode of distribution—they have a plexiform appearance, which no other structures but nerves could be made to assume—and they are similar in form and colour. Under the microscope, when examined with a low power, there is the same indistinct fibrous surface. When separated into their component parts by the assistance of needles, they are resolved into fibrils, exactly similar in form, connexion, and arrangement, and which answer to the distinct characters of the nervous fibrils given by microscopic observers."

Professor Grant examined these plexuses of the gravid uterus with the compound microscope, and declared that "scarcely any difference was perceptible between them and the hypogastric plexuses." "The difference," he said, "is extremely small, if any exists; you are safe in your opinion respecting these new structures, in despite of the microscopic evidence. The evidence from the microscope is very flimsy." Afterwards, Dr. Grant, accompanied by Dr. Renton, of Edinburgh, went to the Museum of St. George's Hospital to examine my preparations, and declared, without reserve, his conviction that the new structures were ganglia and nerves.

On the 20th March, 1840, Dr. Hodgkin examined the dissections of the gravid uterus of six months. He had no doubt that the structures displayed were nervous structures, and he promised to tell Sir Astley Cooper that such was his opinion, and he did so soon after.

"MY DEAR SIR,

"NO. 1, ST. HELEN'S PLACE.

"I have taken up my pen, for the purpose of expressing to you, in writing, my firm conviction that the filaments which I saw this morning ramifying on and into the substance of the uterus, in two preparations at your house, are nerves: and that you have therefore shown by those dissections a far greater number of nerves supplying the uterus than had hitherto been discovered. The deep physiological interest of this discovery I need not dwell upon now. Believe me to remain, sincerely yours,

"SAMUEL SOLLY.

"To Dr. R. LEE, F.R.S., April 4, 1840."

On the 16th April, 1840, Dr. Marshall Hall examined the preparations of the gravid uterus of six and nine months, and in the mare. "I have no doubt," he said, "that you have made out the existence of a new system of nerves and ganglia—the special nervous system of the uterus. It is precisely what we wanted to complete our knowledge of the subject. Never doubt this for a moment, whatever opposition or contradiction you may encounter. I cannot doubt that these great plexuses on the body of the uterus are nervous plexuses." "Mr. Watt," added Dr. M. Hall on this occasion, "was careful to render justice to others in all literary matters, and exacted the same from others to himself. Let us follow his example. Scientific fame must be earned; it is not to be bought at the Stock Exchange, or anywhere else."

Sir Charles Bell, in the month of May, 1840, when passing through London, on his way to Italy, saw my dissections, and said, you have discovered on each side of the neck of the uterus a great nervous centre—a great ganglion—in fact, the brain of the uterus. This ganglion is the centre of all the nerves of the vagina, bladder, rectum, and lower part of the uterus. He said, it is not a plexus, but a distinct ganglion, which is situated over the uterine vein on the left side. The arteries running in the plexuses under the peritoneum, Sir Charles Bell said, demonstrated that they were not bands of elastic tissue, or modifications of cellular substance or fibrous matter.

On the 26th June, 1840, Dr. Prout examined two of these preparations; and a second time, on the 4th July, he said there could be no doubt about the necessity for such a system of nerves. There could be no doubt the new structures were nerves; they had all the characters, and were continuous with nervous structures. He ridiculed the idea that they were gelatinous tissue, which, he said, was nothing but cellular membrane. These nerves give both motion and sensation to the coats of the uterus, as the organic nerves do to the intestines peristaltic action. Could the intestines move without nerves? No more can the uterus. Dr. Prout thought the best plan was to employ an artist to make drawings, and publish a separate work on the nerves of the uterus.

Dr. Elliotson, on the 28th July, 1840, examined the preparations. "*A priori*," he said, "the nerves of the uterus must increase with the other parts. The battery of nerves is in proportion to the size of the muscles. It is most absurd to say that the nerves do not grow. It is a mistake to suppose that the uterus is different from any other organ. Will it inflame and suppurate, unite if divided, and carry on all its functions; and why are we to suppose that its nerves do not increase? The sympathies of the gravid uterus increase—so must its nerves. The nerves of paralytic limbs decrease. Amaurosis results from atrophy of the optic nerves. I have no doubt, on physiological grounds, without your demonstrations, that the nerves of the uterus must increase in the same proportion as all the other parts of the organ during pregnancy."

On the 3rd of November, 1840, I called upon Mr. Kiernan, and informed him that I had made fresh dissections of the nerves of the uterus, and requested him to examine them. He refused to do so. I then requested him to state the grounds upon which, as referee of the Royal Society in 1839, he had decided that the structures I had discovered were not nervous structures. This he refused to do, in a still more peremptory manner. I allowed a short interval to elapse, and then addressed to him the following letter:—"You would oblige me by stating shortly what the microscopic characters are of the different tissues taken from the gravid uterus of nine months, which you examined with Mr. Owen at the College of Surgeons. I am now preparing for publication an account of my dissections of the nerves of the uterus, and I am anxious to be able to state clearly the reasons which have induced you to conclude that the plexuses on the body of the uterus, though continuous with the spermatic and hypogastric nerves, are elastic tissue." Mr. Kiernan returned no answer to this letter, and he has not since 1839 seen any of my dissections.

I made the same request to Professor Owen, with which he immediately complied; and I had the satisfaction of further learning from Mr. Toynbee, that Professor Owen, on the 29th May, 1840, thus expressed his sentiments in a lecture at the College of Surgeons, respecting my labours on the nerves of the uterus. "You will be surprised, gentlemen, that I have not entered upon an examination of the nerves of the organs of generation; but this subject has been so much entered into, and so many additions made to it since the time of Tiedemann, by Dr. Robert Lee, that I shall defer saying anything about it, until these researches shall appear." These researches appeared on the 1st of January, 1841.

THIRD MEMOIR.

1841—1844.

ON the 17th June, 1841, at the request of Dr. Roget and Mr. Lawrence, I presented the following Paper, "On the Nervous Ganglia of the Uterus," to the Royal Society, which was read at the meeting held the same evening. Mr. Lawrence and Dr. Roget had both carefully examined my dissections.

In a communication to this Society, which was read on the 12th December, 1839, I described four great plexuses under the peritoneum of the gravid uterus, which had an extensive connexion with the hypogastric and spermatic nerves. From their form, colour, and general distribution, and their resemblance to ganglionic plexuses of nerves, and from their branches actually coalescing with those of the hypogastric and spermatic nerves, I was induced to believe, on first discovering them, that they were nervous ganglionic plexuses, and constituted the special nervous system of the uterus.

Subsequent dissections of the unimpregnated uterus, and of the gravid uterus in the third, fourth, sixth, seventh, and ninth months of pregnancy, have enabled me not only to confirm the accuracy of my former observations, but to discover the important fact, that there are many large ganglia on the uterine nerves, and on those of the vagina and bladder, which enlarge with the coats, bloodvessels, nerves, and absorbents of the uterus during pregnancy, and which return after parturition to their original condition before conception takes place.

The uterus and its appendages are wholly supplied with nerves from the great sympathetic and sacral nerves. At the bifurcation of the aorta, the right and left cords of the great sympathetic nerve unite upon the anterior part of the aorta, and from the aortic plexus. This plexus divides into the right and left hypogastric nerves, which soon subdivide into a number of branches to form the right and left hypogastric plexus. Each of these plexuses, having the trunk of the hypogastric nerve continued through its centre, after giving off branches to the ureter, peritoneum, rectum, and trunks of the uterine bloodvessels, descends to the side of the cervix, and there terminates in a great ganglion, which, from its situation and relations, may be called the hypogastric ganglion, or utero-cervical ganglion.

This ganglion is situated by the side of the neck of the uterus, behind the ureter, where it is passing to the bladder. In the unimpregnated state it is usually of an irregular, triangular, or oblong shape, with several lobes or processes projecting from it, where the nerves enter, or are given off from it. In the long diameter it usually measures from half an inch to three-quarters of an inch, varying in dimensions with the size of the nerves with which it is connected. The hypogastric ganglion always consists of cineritious and white matter like other ganglia, and gray and white nerves issue from it, which proceed to the rectum, bladder, uterus, and vagina. It is covered with the trunks of the vaginal and vesical arteries and veins, and the ganglion has an artery of considerable size, which enters it near the centre, and divides into branches which accompany the nerves given off from its inner surface, and from its anterior and inferior borders. The hypogastric nerve, after separating into a plexus, enters its upper edge, and branches from the third and other sacral nerves, its posterior border, and the whole of its outer surface. None of the branches of the sacral nerves pass over the ganglion to the bladder, though some of them enter its anterior edge where the vesical nerves are given off.

From the inner and posterior surface of each hypogastric ganglion, numerous large nerves are given off which go backward to anastomose with the hemorrhoidal nerves, which accompany the arteries to the rectum, and pass with them between the muscular fasciculi of the organ. An extensive connexion is thus established between the two hypogastric ganglia and the nerves of the rectum, and many large, broad nerves pass off from the posterior and inferior part of these ganglia, to ramify on the sides of the vagina, and between the vagina and rectum.

From the inferior border of each hypogastric ganglion several fasciculi of small nerves are sent off, which pass down on the sides of the vagina, and enter several large flat ganglia about midway between the os uteri

and ostium vaginæ. From these vaginal ganglia, innumerable filaments of nerves, on which small ganglia are formed, extend downwards to the sphincter, where they are lost in a white dense membranous expansion, from which they cannot be separated without laceration. From this great web of ganglia and nerves on the sides of the vagina, by which it is completely covered, numerous branches are sent to the sides of the bladder which enter it around the ureter. All these nerves of the vagina are accompanied with arteries, and they often form complete rings of nerve around the trunks of the great veins.

From the anterior margin of each hypogastric ganglion, large white and grey nerves are sent off, some of which pass on the outside, and others on the inside of the ureter, and these branches meet in front of the ureter in a ganglion, which may be termed the *middle vesical ganglion*. There are other two ganglia formed on these nerves, one between the uterus and ureter, and the other between the ureter and vagina. These may be called the *internal and external vesical ganglia*. The ureter is thus inclosed within a great ring of nerve, which resembles the œsophageal ganglion in some of the invertebrata. The trunks of the uterine artery and vein are likewise encircled by a great collar of nervous matter, between which and the hypogastric ganglion several large and some small branches pass.

The *internal vesical ganglion*, which usually has a flattened or long bulbous shape, is formed entirely upon the nerves which pass from the hypogastric plexus and ganglion, and run between the uterus and the ureter. It has an artery which passes through its centre. It first gives off a large branch to the ring of nerve or ganglion which surrounds the uterine bloodvessels; it then sends branches to the anterior part of the cervix uteri, and afterwards a great number of small filaments to the muscular coat of the bladder behind, where it is in contact with the uterus. The *internal vesical ganglion* then sends forward a large branch which terminates in the *middle vesical ganglion*.

This ganglion sends off a great number of large nerves to the bladder. Some of these accompany the arteries, and can be seen ramifying with them upon the whole of the superior part of the organ, even to the fundus. Filaments of these nerves, scarcely visible to the naked eye, are seen ramifying upon the bundles of muscular fibres, occasionally forming loops, and enclosing them, or passing down between them to the strata of fibres below. Some of the smaller branches of the *middle vesical ganglion* do not accompany the arteries, but are distributed at once to the parts of the bladder around the ureter.

The *external vesical ganglion* is formed entirely upon the nerves which proceed from the hypogastric ganglion, and pass on the outside of the ureter. This is a small thin ganglion, the branches of which are sent immediately into the muscular coat of the bladder. It usually sends down a long branch to anastomose with the nerves and ganglia situated on the side of the vagina.

From the inner surface of each hypogastric ganglion, numerous small, white, soft nerves pass to the uterus, some of which ramify upon the muscular coat about the cervix, and others spread out under the peritoneum, to coalesce with the great ganglia and plexuses situated on the posterior and anterior surfaces of the organ. Large branches also go off from the inner surface of the hypogastric ganglion to the nerves surrounding the bloodvessels of the uterus, which they accompany in all their ramifications throughout its muscular coat. Other branches of nerves pass down from the ganglion between the vagina and bladder. Soon after conception, the bloodvessels of the nervous ganglia and plexuses now described, enlarge, and the ganglia and plexuses themselves expand with the uterus. The long diameter of the hypogastric ganglion at the end of the ninth month measures about an inch and a half.

I have published a full description, with illustrations of the great ganglionic nerves surrounding and accompanying the bloodvessels, and of the ganglia and plexuses, situated on the body of the uterus.* The appearances presented in the fourth month of pregnancy by the hypogastric ganglia, and the ganglia and nerves of the rectum, bladder, vagina, and uterus, and also the great plexuses of nerves situated on the anterior surface of the uterus, are seen in the Plates which accompany this Paper.

From an examination with the microscope of portions of the plexuses under the peritoneum of a gravid

* The Anatomy of the Nerves of the Uterus. London, 1841. Fol.

uterus of nine months, which had long been immersed in rectified spirit, Professor Owen and Mr. Kiernan were led to conclude that they were not nervous plexuses, but bands of elastic tissue.

"The tissue of the broad, white, reticularly intercommunicating bands of fibrous matter, resembling nerves of the uterus," observes Professor Owen, "consisted of minute fibres, which were solid, smooth, equal-sized, cylindrical, and nearly transparent, irregularly interblended in their course; their diameter does not exceed $\frac{1}{100000}$ th of a line. These bands correspond in structure with the fibrous modification of cellular tissue. The component fibres did not form tubes, nor were their interspaces filled with the primitive granules or cells of the nervous tissue.

"In the nerves of the spinal system, the primitive fibres of the neurilema, which closely resemble those of the ordinary cellular and fibrous tissues, are arranged in the form of tubes, and can be distinguished into cylinder and contents. The same structure, on a minute scale, exists, according to Valentin,* in the sympathetic nerves; but according to the observations of Remak and Schwann,† the component fibres form solid bands, and are of a more transparent character than in the spinal nerves, but marked occasionally with swellings, and having granules in the interspaces.

"I consider that the difference between the nerves of the sympathetic and the fibrous cellular tissue to consist, as regards their microscopic character, in the greater proportion of the granules or cells in the interspaces of the fine reticularly interwoven component fibres of the nervous band; and this difference I believe to exist between the two nerves of the sympathetic system and the white bands of fibrous matter which connect the peritoneum with the muscular substance of the womb, and which resemble a plexus of nerves."

The tubular structure of the ganglionic plexuses on the body of the uterus has since been observed by Mr. Dalrymple, and the perfect resemblance of the uterine nerves to those of the stomach and intestines demonstrated. The following letter contains an account of Mr. Dalrymple's microscopic examination of the uterine nerves.

"6, HOLLES STREET, April 21, 1841.

"MY DEAR SIR,—After having seen and very carefully examined, some weeks since, your very beautiful preparation of the nerves of the impregnated uterus, and after having felt convinced, by their continuity, colour, texture, and mode of distribution, that they really were nerves, I was a good deal surprised to hear from you and others that their identity had been doubted. I was aware that it would have been worse than useless to have asked you for a portion of such suspected cords to submit to the microscope, knowing that they had been very many months immersed in strong alcohol. It would neither have been fair to you, nor satisfactory to me, to have made such an attempt at solving the question.

"Being anxious, however, to satisfy myself upon the subject, I obtained an uterus (unimpregnated), and while it was quite recent, I traced several nerves, which I recognised, from their situation round the ureter, and upon the body of the uterus, to be similar to some you had previously pointed out to me. These filaments I submitted to the microscope, and used a very beautiful eighth-of-an-inch object glass made by Ross. I found that it was impossible, with the most careful dissection, to detach any filament of nerve without including a quantity of cellular and elastic tissue; so that although the tubular portion, indicating the nerve, was distinct, yet it was surrounded by innumerable extremely minute threads, coiled and contorted, such as one finds the component of elastic tissue, and the ultimate element of cellular membrane.

"Under slight pressure, however, the tube was plainly discernible, containing granular matter, not uniformly distributed, but collected in minute masses, at intervals. Small bloodvessels were also seen here and there, with blood-discs within them, which served to indicate the difference between the nervous and vascular tubes, and thus to avoid the possibility of error.

"Being, however, aware that some of the most distinguished foreign microscopic anatomists had differed as to what was the real characteristic of nerves of the sympathetic system, I should not have troubled you with this communication had I stopped here.

* Repertorium, iii. p. 76.

† Mikroskopische Untersuch, p. 179.

"Feeling, from this discordance of opinion, that there was no absolute test, or at least one which was not open to cavil, I thought to try a comparison of the uterine nerves with those that undeniably belonged to the ganglionic system. I traced, therefore, some nerves upon the surface of the stomach, up to the great ganglion that gave them origin; and I selected some also from the small intestine. These I submitted to the same microscopical power, and under the same circumstances of light, and pressure, and medium.

"In all of these I observed the tubular part filled with granular matter, and similarly collected in minute masses.

"I also observed that each tube was surrounded by the minute serpentine threads before described. In fact, so closely did they agree, in every particular, with the appearances presented by the uterine nerves, that it would have been impossible to distinguish the one from the other.

"Thus, by comparing the unknown with the known, despite the want of any absolute test, I feel perfectly satisfied of the true nervous character of the very beautiful plexuses you have so patiently, and with so much labour, developed.

"Admitting, then, this intricate structure to be really nervous, it is a matter of no marvel that they increase in size during pregnancy. It would indeed be wonderful if the nerves alone remained stationary, while the muscular and cellular, the serous and mucous, and the vascular tissues increased, as it is notorious those structures of the uterus do, during the period of child-bearing.

"If, as is also indisputable, nerves shrink and atrophy when the function of an organ they supplied is lost or destroyed, is it singular that the uterine nerves should increase, when that organ rouses itself from inaction, to one of the most extraordinary exemplifications of temporary functional vigour that the animal economy can anywhere exhibit? Pardon me this prolixity, and believe me, my dear Sir, yours very faithfully,

"DR. ROBERT LEE, F.R.S."

"JOHN DALRYMPLE.

On the 16th June, 1842, I presented to the Royal Society a communication, entitled, "An Appendix to a Paper on the Nervous Ganglia of the Uterus, with a further account of the Nervous Structures of that Organ," which was read the same evening. These communications were published in the *Philosophical Transactions*, with three engravings. Mr. Lawrence was the referee on both these Papers, and, on his recommendation to the Council, they were published in the *Philosophical Transactions*.

From the functions of the human uterus, Galen inferred that it must be supplied with nerves; but there is no evidence to prove that Galen, or any of the celebrated anatomists who flourished before the middle of the eighteenth century, ever traced the great sympathetic and sacral nerves into the uterus, or discovered that its nerves enlarge during pregnancy. This was first done by Dr. W. Hunter, who describes the hypogastric nerve on each side as passing to the gravid uterus, behind the hypogastric vessels, and spreading out in branches like the portio dura of the seventh pair, or like the sticks of a fan, with many communications over the whole side of the uterus and vagina. As Dr. Hunter never examined the nerves of the unimpregnated uterus, and saw the nerves of the gravid uterus dissected only in one subject, he did not certainly know that they increased after conception.* "I cannot," he observes, "take upon me to say what change happens to the system of uterine nerves from utero-gestation, but I suspect them to be enlarged in proportion as the vessels."†

Mr. John Hunter denied that the nerves of the uterus ever enlarged during pregnancy. "The uterus in the time of pregnancy," he says, "increases in substance and size, probably fifty times beyond what it naturally is, and yet we find that the nerves of this part are not in the smallest degree increased. This shows that the brain and nerves have nothing to do with the actions of a part, while the vessels which are evident increase in proportion to the increased size; if the same had taken place with the nerves, we should have reasoned from analogy."‡ Dr. William Hunter left no preparations of the nerves of the uterus, nor did Mr. J. Hunter, in support of their conflicting statements, and at the beginning of the year 1838 I believe there were no pre-

* It has been pointed out to me that Dr. Hunter referred merely to a dissection of the unimpregnated uterus.

† An Anatomical Description of the Human Gravid Uterus. Lond. 1794, p. 21.

‡ The works of J. Hunter, vol. iii. p. 117, A.D. 1837.

parations in this country, showing the nerves of the uterus dissected, either in the unimpregnated or gravid state. Sir Astley Cooper then maintained, that it was impossible for the nerves of the uterus, or the nerves of any other organ, to increase under any circumstances.

In 1822, Professor Tiedemann published a description of the nerves of the uterus with two engravings. In the first, the spermatic nerves are represented on both sides accompanying the spermatic arteries to the ovaria. The spermatic veins, and the nerves which followed them, are not seen. A few small branches of nerves from the hypogastric plexus are seen ramifying on the posterior and inferior surface of the uterus with the uterine arteries. The whole of the superior part of the uterus is covered with peritoneum. In the second Plate some small branches from the left hypogastric nerve, before it enters the great ganglion at the cervix, are seen accompanying the left uterine artery on the left side of the lower part of the uterus. From Professor Tiedemann's work it might justly be inferred, that the human gravid uterus is more sparingly supplied with nerves than any other organ in the body.*

In 1823, Professor Lobstein stated that the uterus before and after conception had a very scanty supply of nerves, "*Rarissime in uteri substantiam tum vacui tum gravidi sese immittere videntur nervorum surculi.*"†

In 1829, Professor Osiander affirmed that the nerves of the human uterus had never been seen, either by himself or by any other anatomist, and that he had been deceived by the authority of scientific persons, when he stated that nerves were spread over the whole uterus.

On the 8th of April, 1838, while dissecting a gravid uterus of seven months, I accidentally observed the trunk of a large nerve proceeding upward from the cervix to the body of the uterus along with the right uterine vein, and sending off branches in its course to the posterior surface of the uterus, some of which accompanied the ramifications of the vein, and others were inserted into the peritoneum. A broad band, resembling a plexus of nerves, was seen extending across the posterior surface of the uterus, and covering the nerve midway between the fundus and the cervix. On the left side the same appearances were seen, and several branches of the nerves accompanying the uterine vein were distinctly continuous with branches of the great plexus crossing the body of the uterus. The preparation was placed in the Museum of St. George's Hospital on the 1st of October, 1838. Several eminent anatomists, to whom I showed the preparation, thought that I had been misled by appearances, and that they were absorbent vessels accompanying the veins and tendinous fibres, spread across the posterior surface of the uterus. They all acknowledged that they had never seen nor dissected the nerves of the uterus, either in the human subject or in any of the lower animals. I resolved, when another opportunity should present, to follow the sympathetic into the gravid uterus, with the utmost care, that I might discover, if possible, the nature of the great plexuses covering its surface.

On the 18th of December, 1838, a woman in the sixth month of pregnancy died in St. George's Hospital, a few hours after the fœtus and its appendages had been expelled; the uterus was removed with all its blood-vessels and nerves remaining connected with it, and the great sympathetic and sacral nerves were traced to the different parts of the uterus, while the preparation was under alcohol.

In a communication to this Society, which was read on the 12th of December, 1839, I described the appearances displayed in these dissections, and represented by figures, the spermatic, hypogastric, and sacral nerves passing into four great plexuses under the peritoneum of the body of the uterus. From the form, colour, vascularity, and general distribution of these plexuses, and from their branches actually coalescing with those of the great sympathetic, I inferred that they were true nervous ganglionic plexuses, and formed the nervous system of the uterus. Some anatomists of reputation formed a different opinion, and concluded that they were nothing but bands of elastic tissue, gelatinous tissue, or cellular membrane connecting the peritoneum with the muscular coat of the uterus. All who examined the dissections admitted that the plexuses were accompanied with arteries, and were continuous with the spermatic and hypogastric nerves. None attempted to show in any other part of the body, bands of elastic tissue assuming a similar plexiform

* *Tabulæ Nervorum Uteri*, fol. Heidelbergi, 1822.

† *De Nervi Sympathetici Humani Fabrica*, &c. Paris, 1823, p. 31.

appearance, accompanied with arteries or continuous with nerves. The communication was withdrawn from the Royal Society.

I continued the investigation of this subject during the whole of 1840 and 1841, and discovered the great nervous ganglia at the neck of the uterus, a description of which is contained in the last volume of the *Philosophical Transactions*. But these ganglia, which exceed in size the semilunar ganglia of the great sympathetic, constitute only a small portion of the nervous system of the human uterus. I propose now briefly to describe other nervous structures, of far greater size, as displayed in the dissection of a gravid uterus at the end of the ninth month of pregnancy.

In this preparation the great sympathetic nerve sends numerous branches from both its cords to the trunk of the inferior mesenteric artery, which form a great plexus around it. These nerves accompany all the ramifications of the artery, but the greater number proceed with the hemorrhoidal artery to the rectum. The two cords of the great sympathetic, after giving off these branches to the inferior mesenteric artery, pass down before the aorta, nearly two inches below its bifurcation, where they are united by several fine nervous filaments. But the cords continue distinct, and soon separating, each passes down behind the hypogastric blood-vessels to the side of the neck of the uterus, and there terminates in the corresponding hypogastric or utero-cervical ganglion. The left cord of the great sympathetic, or, as it is usually called, the hypogastric nerve, enlarges greatly as it approaches the hypogastric ganglion. This ganglion is nearly two inches in breadth, and covers a great part of the cervix uteri. It appears to consist of six or seven smaller ganglia, which are united together by nervous cords. Each of these ganglia is a thick solid nervous mass, of an orange-white colour, inclined to brown. Arteries which have been injected pass through these smaller ganglia and accompany the various nervous filaments which proceed from them. Into the whole outer surface of the left hypogastric ganglion, numerous branches from the third sacral nerve enter; and behind there is a great connexion formed between the ganglion and the branches of the left hemorrhoidal nerve. The vaginal nerves arise from the inferior margin of the ganglion, and the vesical from its anterior border. Some of these nerves pass on the outside of the ureter to enter the middle vesical ganglion, and others pass on the inner surface of the ureter to the anterior part of the neck of the uterus.

From the superior and anterior part of the left hypogastric ganglion, a plexus of nerves, accompanied by an injected tortuous artery, proceeds upward along the whole body of the uterus, near the left side, to the trunk of the left spermatic vein, and there terminates in a dense, reddish brown coloured mass, consisting of fibres firmly interlaced together, and which has all the characters of a true nervous ganglion. From its vicinity to the principal spermatic artery and vein, which it partly surrounds, and the ligament of the ovary, it may be called the *left spermatic ganglion*. Between this ganglion and the left hypogastric ganglion, an artery extends, which is closely embraced by a plexus of nerves, and a direct nervous communication is thus established between these remote ganglia. The nerves adhered so firmly to the artery through its whole course, that before they were separated they presented the appearance of two white lines on its sides, with filaments crossing over the vessel. From these nerves extending between the left hypogastric and spermatic ganglion, branches with arteries are given off in their whole course to the *subperitoneal ganglia* and *plexuses* on the posterior surface of the uterus, and also branches to the plexuses on the anterior surface. On approaching the spermatic ganglion, these nerves with their artery pass under or between the branches of the *left subperitoneal plexuses* and frequently communicate with them by fine nervous filaments. The artery can be readily traced through the substance of the spermatic ganglion, but the nerves which accompany it from the hypogastric ganglion, immediately disappear on entering the mass. Numerous large branches of nerves from the left subperitoneal plexus likewise terminate in the left spermatic ganglion, but some of them pass under it, and proceed to the round ligament; and others are continued upward, gradually diminishing in size as they approach the renal plexus along the spermatic bloodvessels. From the upper border of this ganglion, large flat nerves proceed to ramify on the fundus uteri, and pass with the vessels into the muscular coat. The trunk of the spermatic vein and artery is almost completely surrounded with this ganglion, as the trunks of the uterine and vaginal arteries and veins are inclosed within rings of nerve connected with the hypogastric ganglion.

In this dissection there are nervous structures displayed on the anterior and posterior surfaces of the uterus of still greater magnitude. These, from their situation, may be called the *subperitoneal ganglia* and *plexuses* of the uterus.

Over the middle of the lower part of the body of the uterus behind, immediately beneath the peritoneum, is situated the posterior subperitoneal ganglion, which is considerably larger than the left hypogastric ganglion. It presents the appearance of a layer of dense structure, composed of fibres strongly interlaced together, having a yellowish brown colour. It adheres firmly to the peritoneum, but between its lower surface and the muscular coat of the uterus, there is interposed a thick soft layer of cellular substance, through which filaments of nerves and branches of considerable size pass to the muscular coat of the uterus. The middle part of the ganglion is more than two lines in thickness, but it becomes everywhere thinner towards the circumference, and particularly at the inferior border, where it sends off many nerves to the back part of the vagina. From its left lower and lateral part, it sends off two layers of broad nerves, one of which adheres to the peritoneum, and the other closely invests the muscular coat and bloodvessels of the uterus. Between these layers there is placed a very thick mass of soft cellular membrane, through which innumerable branches of nerves pass between these layers, the hypogastric ganglion, and the plexus of nerves with the injected artery extending between the hypogastric and spermatic ganglion. Many of the superficial nerves pass down under the peritoneum, and terminate in the upper border of the left hypogastric ganglion, and upon these superficial nerves there is formed another ganglion of considerable size, between which and the hypogastric nerve numerous branches of soft nerves extend. This ganglion formed on the nerves under the peritoneum, near the edge of the uterus, is thick and solid, and consists of a yellowish brown substance, with white nervous filaments interlaced, and arteries of considerable size passing through it. From its lower border large nerves extend to the upper edge of the hypogastric ganglion, and innumerable soft nerves enter the whole inner surface of the hypogastric ganglion, which take their origin from the lower part of the great subperitoneal ganglion. The upper part of this ganglion becomes firmly adherent both to the peritoneum and muscular coat of the uterus, which it covers as high as the fundus. Large broad nervous plexuses, superficial and deep, extend from the upper portion of the subperitoneal ganglion across the body of the uterus to the spermatic ganglion, and bloodvessels, and the round ligament, around which they form a sheath of nerves.

In an elaborate drawing by Mr. Joseph Perry, all the ganglia and plexuses on the left side of the uterus now described, have been represented with the greatest fidelity.

As the arteries and veins on the right side of the uterus are only partially injected, the nerves extending between the hypogastric and spermatic ganglia have not been so minutely traced. But that there is a similar nervous chain connecting these great ganglia of the fundus and cervix, and the subperitoneal ganglia and plexuses, does not admit of doubt, and has been clearly demonstrated by other dissections at an earlier period of pregnancy.

Over the middle of the anterior and lower part of the body of the uterus, there is situated a nervous and vascular mass, of great extent, and similar in structure to the subperitoneal ganglia described on the posterior surface. It adheres to the peritoneum firmly, but on being divided longitudinally, it is also observed to be separated from the muscular coat of the uterus by a soft stratum of cellular membrane. From the lower part of this *anterior subperitoneal ganglion* nerves are sent down to the cervix uteri and vagina, and numerous branches pass off on both sides to the hypogastric ganglia. Superficial and deep plexuses of nerves are likewise sent off from its superior lateral borders, which proceed across the uterus, sending branches into the muscular coat, and uniting with all the ganglionic plexuses on the posterior surface. The appearances presented by the anterior subperitoneal ganglia and plexuses in the fourth month of pregnancy, have been displayed in the second engraving which illustrated the paper on the nervous ganglia of the uterus. At that period, the ganglion seemed nothing but a thin nervous and vascular membrane, imbedded in soft cellular substance, through which the delicate nervous filaments, accompanied with arteries, proceeded to the superior angles of the uterus. On comparing this dissection with that now described, it is impossible to avoid being struck with the enormous development of these nervous structures during the four latter months of pregnancy, or to resist

the conclusion that these are formed for the purpose of supplying the uterus with that nervous power which it requires during labour.

These dissections prove that the human uterus possesses a great system of nerves, which enlarges with the coats, bloodvessels, and absorbents during pregnancy, and which returns after parturition to its original condition before conception takes place. It is chiefly by the influence of these nerves that the uterus performs the varied functions of menstruation, conception, and parturition, and it is solely by their means that the whole fabric of the nervous system sympathizes with the different morbid affections of the uterus. If these nerves of the uterus could not be demonstrated, its physiology and pathology would be completely inexplicable.

After the publication of these papers in the *Philosophical Transactions*, I became a Member of the Council of the Royal Society, and continued in the Council two years. Certain transactions subsequently took place which, it was anticipated by some, would make all anatomists believe that my descriptions and delineations of the ganglia and nerves of the uterus were errors and misrepresentations. The information I possessed respecting this memorable scheme "for the improvement of natural knowledge," which will hereafter furnish materials for a *new chapter* in the History of the Royal Society, induced me, during the years 1843 and 1844, to request all the most distinguished anatomists, physiologists, and medical practitioners whom I could prevail upon, to examine my dissections, and record their opinions in writing. Some of these opinions are subjoined. They are not produced as testimonials to recommend my labours, but are furnished for the purpose of proving that many scientific observers viewed the structures which I had displayed as true nervous structures. At different periods, the dissections have likewise been examined by many other gentlemen of established character, and I never heard one of them express a doubt respecting the accuracy of my descriptions and delineations of the uterine nerves. Of these were Dr. Chambers, Dr. Bright, Dr. Copland, Dr. F. Ramsbotham, Dr. Merriman, Dr. Collins, Dr. Ashwell, Dr. Oldham, Dr. Lever, the Professors Retzius of Stockholm, Professor Meigs of Philadelphia, Dr. Moore, Dr. Mantell, Dr. Melville, Dr. Tyler Smith, Dr. Craigie, Sir Charles Clarke, Dr. Baly, Dr. Boyd, Dr. Willis, Dr. Webster, Dr. B. Hawkins, Dr. Grana, Dr. Gibbs, Dr. Wilson, Dr. Pettigrew, Dr. Nairne, Dr. Bence Jones, Dr. Rees, Dr. S. Thompson, Dr. A. T. Thompson, Dr. Johnes, Dr. Chowne, Dr. Thatcher, Dr. Murphy, Dr. H. Davies, Dr. Hunt, Monsieur Velpeau, Dr. Bennett, Dr. Elliot of Stockholm, Dr. Boeck, Dr. N. Arnott, Dr. James Arnott, Dr. Willis, and by Mr. Liston, Mr. Hilton, Mr. Lane, Mr. Erasmus Wilson, Mr. Gregory Smith, Mr. Prescott Hewett, Mr. Streeter, Mr. Copeland, Mr. G. Babington, Mr. George Young, Mr. Gray, Mr. Simon, Mr. Higginbotham, and Mr. Barlow.

"MY DEAR SIR,

"MOLESWORTH-STREET, DUBLIN, April 22, 1842.

"I received the paper on the Nerves of the Uterus which you so kindly sent me, and beg to congratulate you on the triumphant success of your researches; and I rejoice exceedingly that what was begun in our own country by W. Hunter has been brought to perfection in our own country by your talent and perseverance; and as such I shall speak of it.—Yours very sincerely,

"W. F. MONTGOMERY, M.D."

"MY DEAR SIR,

"CAMBRIDGE, February 23, 1843.

"I have just received a copy of your paper on the Nerves of the Uterus, and of the Appendix thereto, and beg you to accept my very grateful thanks for your present. You will allow me to express what I fully feel—that the dissections which the plates represent evince, in my opinion, such consummate skill and patience, as can only be equalled by the great value of that sure foundation which they afford to the physiology of the organ.—I am, my dear Sir, your obliged and very obedient,

"WILLIAM CLARK, F.R.S.

"Dr. R. LEE, &c."

"MY DEAR SIR,

"CAMBRIDGE, March 22, 1846.

"You ask me whether, 'after having had an opportunity of examining your dissections of the Nerves of the Uterus, I am of opinion that the descriptions and delineations which you have given of them in the *Philosophical Transactions*, are correct?' In answer, I beg to state that, in my judgment, the plates represent, as fairly as may be, the results of your extremely elaborate and minute dissections. They are certainly not

overcharged. I have yet had no opportunity of ascertaining whether what had to the unassisted eye every appearance of being ganglia and nerves, have also the microscopic characters of those structures.—I am, my dear Sir, your very obedient, &c.

“Dr. R. LEE.”

“WILLIAM CLARK, F.R.S.

“14, MANCHESTER-SQUARE, February 8, 1844.

“I have, on several occasions, most carefully examined the anatomical preparations of the uterus made by Dr. Robert Lee; and I have no hesitation in saying that, in my opinion, they display a system of ganglia, nervous loops, and nerves, belonging to the uterine system, of great extent and importance.

“MARSHALL HALL, M.D., F.R.S., &c.”

“MON TRES HONORE CONFRERE,

“ST. JAMES'S-SQUARE, Friday.

“Vous m'avez fait un cadeau bien précieux, en me croyant digne de posséder le résultat admirable de vos longs et difficiles travaux. Je vous en remercie bien sincèrement. Mes collègues de Genève, auxquels je ferai connoître cette stupendous découverte du développement des nerfs de l'uterus, partageront l'estime et l'admiration que son auteur m'a inspiré.—Agréez, dear Sir, l'expression de ma reconnaissance et de mon sincère dévouement,

“MAUNOIR, Prof.”

Professor Maunoir, in the presence of Dr. Gardiner, of Bolton-street, had carefully examined the dissections made, before writing this letter, some years ago.

“DEAR SIR,

“EDINBURGH, NEWINGTON, June 29, 1844.

“Since my return to Scotland I have turned over in my mind the opinion I offered you in Savile-row, whilst examining the very beautiful preparations you showed me of the nerves of the ‘unimpregnated and of the gravid uterus.’ The opinion amounted to this: that what you showed me as nerves, ganglions, and nervous filaments of communication, are really such, and can be nothing else; that the increase in size or bulk, to which so much importance has been attached, has been, upon the whole, somewhat exaggerated by those who have adopted a different view from that I now propose; that the preparations you showed me are, without exception, the most beautiful I have ever seen of any part of the nervous system; that, viewed simply as dissections of structures difficult to unravel, they merit the highest praise; but taken in connexion with the physiology of the organs, they place the dissector in the foremost place of observers.—Very faithfully yours,

“R. KNOX, M.D., F.R.S.E.”

“MY DEAR SIR,

“THE OAKS, AMBLESIDE, March 25, 1844.

“Now that I am at home, and have leisure, let me thank you for the gratification I had, when in town, in seeing your preparations, displaying the nerves of the uterus in its unimpregnated and pregnant states. I never witnessed any anatomical demonstration more satisfactory; indeed, I cannot but consider your dissections of these nerves as a perfect demonstration, &c. &c.—I remain, my dear Sir, with much esteem, faithfully yours,

“J. DAVY, M.D., F.R.S.”

“I have derived great pleasure from examining the dissections of the uterine, vaginal, and vesical nerves made by Dr. Lee. The trunk and branches of the sympathetic nerve being left, as well as the trunks of some of the sacral nerves, a satisfactory clue is afforded in the examination. The injection of the bloodvessels renders a further and valuable aid in testing what are, and what are not, nervous fibrils.

“After carefully inspecting and examining these beautiful dissections, I have no hesitation in expressing my conviction that they bear out, fully and entirely, the delineations and descriptions published by Dr. Lee.

“1. The preparations show an unequivocal continuity of fibres proceeding from undisputed nervous structures—the sympathetic and sacral nerves, to the newly-discovered ganglia of the uterus, vagina, and ureter.

“2. The nervous branches of the newly-discovered ganglia join, in various directions, with acknowledged nerves, such as those of the inferior mesenteric plexus, furnishing the hemorrhoidal nerves, and with the spermatic nerves, descending on the uterus from the folds of the broad ligaments.

"3. The occurrence of small ganglia and gangliform enlargements, on the newly discovered nerves, are very characteristic, and corroborative of their real nature.

"4. The nerves are accompanied by injected bloodvessels, in a manner that is not seen in elastic tissue, although usual with the ganglionic nerves.

"5. The ganglia discovered by Dr. Lee present, in their form and disposition, and in the openings which they possess, a perfect and entire correspondence with the larger ganglia of the sympathetic.

"After the examination which I have made, it certainly appears to be impossible for any one to arrive at a just conclusion respecting the true character of Dr. Lee's description, without a careful inspection of his preparations. It is proper to add, that I have not yet had an opportunity of making a microscopical examination.

"Nov. 13, 1843."

"R. D. GRAINGER, F.R.S.

"MY DEAR SIR,

"HYDE-PARK BARRACKS, January 12, 1844.

"I have read your Papers in the *Philosophical Transactions* on the Ganglia, and on the other Nervous Structures of the Uterus, and carefully examined the preparations which you exhibit as vouchers for the facts you have announced.

"Your descriptions and plates appear to me to be executed with remarkable fidelity.

"I cannot doubt but that the structures which you have shown by dissection are really nerves, and nervous ganglia, because their fibres are clearly shown to be continuous with the sympathetic, and with the sacral nerves, and because I do not believe that any ingenuity in the art of dissection could show such a regular continuity between the nerves and fibres of elastic tissue, or that this tissue could be made to imitate the nerves and nervous ganglia displayed in your preparations. I am, my dear Sir, very sincerely yours,

"Dr. ROBERT LEE."

"GEORGE GULLIVER, F.R.S.

"MY DEAR SIR,

"MERRION SQUARE, DUBLIN, Jan. 17, 1844.

"I have a perfect recollection of the gratification I experienced at examining, along with you, your preparations of the nerves of the uterus. Most schoolmen admit the simplest of all sensible proofs to be *demonstration*, and where, as in your case, the fact at issue is capable of being tested by such proof, I am at a loss to know how a question can arise on the matter. For myself, I can only say that I was as satisfied what I saw was nerves and ganglionic structure, as I am of the existence of nervous structure in any other organ of the human body with which I am familiar. Believe me, yours very faithfully,

"EVORY KENNEDY, M.D."

"MY DEAR SIR,

"GROSVENOR STREET, Jan. 6, 1844.

"I have much pleasure in complying with your request that I would state the result of my impressions on viewing your dissections of the impregnated uterus.

"I see no reason to doubt the correctness of your views—viz., that the immense network which you have so industriously investigated on the surface of the uterus is composed of true nerves and nervous ganglia. To my judgment they present all the visible characters of nerves, and appear to be in direct communication with the pelvic branches of the sympathetic. I am, my dear Sir, very truly yours,

"To Dr. ROBERT LEE."

"F. C. SKEY, F.R.S.

"MY DEAR SIR,

"BROOK STREET, January 8, 1843.

"In reply to your question, with what impression I came from the examination of your dissections of the gravid uterus, I can have no hesitation in stating my opinion to be, that your dissections do satisfactorily display the uterine nerves and their ganglia. Looking to the arrangement, connexions, and relations with the bloodvessels which the filaments and intumescences present, I cannot think otherwise of them than that they are the uterine nerves and ganglia. Believe me to be, my dear Sir, yours sincerely,

"Dr. R. LEE."

"EDWARD STANLEY, F.R.S.

"MY DEAR SIR,

"ST. BARTHOLOMEW'S HOSPITAL, *December 19, 1843.*

"After the minute examination of your preparations of the nervous system of the gravid uterus which you permitted me to make, I examined your descriptions, and Mr. Perry's delineations of them. Both appear to me remarkable for their accuracy.

"With regard to any doubt whether the structures which you have dissected be, as you have described them, nerves and nervous ganglia, it is chiefly by these following facts that I feel convinced of the truth of your account:—

"1. That there is a visible and orderly continuity between the well-known hypogastric and sacral nerves, and the most minute and remote of the nervous cords which you have displayed.

"2. That these cords, like those of larger size, have such an appearance of being nerves as could not, I am sure, be imitated by dissections of any other known structure.

"3. That the ganglia which you have found are like those of other parts of the sympathetic system, and have distinct nervous cords passing to and from them.

"4. That many of the minutest, as well as of the larger nerves, are evidently associated with bloodvessels.

"5. That the nervous system displayed is such an one as the pregnant uterus, from its known structure and functions, might be expected to possess.

"I think that your statements are proved by all the evidence to which it is possible, in the present condition of science, to attain; and I beg to add my congratulations to those which you have already received, on your having, by a truly admirable perseverance and dexterity, made one of the most important anatomical discoveries of the century. Believe me, my dear Sir, very truly yours,

"JAMES PAGET."

"MY DEAR SIR,

"WHITEHALL-PLACE, *December 28, 1843.*

"I have carefully examined your dissections of the nerves of the gravid uterus on various occasions, and I continue to believe, as I did in the first instance, that the structures you have succeeded in displaying are ganglia and nerves; while I am satisfied that your figures and descriptions are perfectly correct. The extraordinary and interesting spectacle you have set before us is so entirely novel, that some hesitation might very probably be felt in arriving at a decided opinion on the subject. Yet this augmented size of nerves and ganglia is only analogous to the increased development of bloodvessels in the gravid uterus, with which we have been long familiar: probably a corresponding change might be found in the absorbing system, if it were submitted to the same kind of patient investigation which you have bestowed on the nerves.

"The considerations which have led me to form the conclusions above mentioned, are exactly the same as those so clearly stated by my colleague, Mr. Paget. I have therefore only to add, that I entirely agree with what he has written to you on the subject. Remaining, my dear Sir, yours very faithfully,

"DR. R. LEE."

"WILLIAM LAWRENCE, F.R.S.

"MY DEAR SIR,

"14, SAVILE ROW, *December 29, 1843.*

"I have carefully inspected your preparations, exhibiting the nerves of the gravid uterus, and I can find no reason to doubt the correctness of the statements which you have published in the *Philosophical Transactions*. Yours truly,

"B. C. BRODIE, F.R.S."

FOURTH MEMOIR.

1845—1848.

BEFORE receiving the following letter from Dr. Sharpey, on the 2nd December, 1840, I had shown him my dissections of the ganglia and nerves of the uterus, and requested him to state the grounds upon which he had refused to admit that the structures displayed in these dissections were nervous. Believing that his doubts arose from never having examined these structures with the microscope, I cut away, in his presence, portions which he selected from a gravid uterus, and gave them to him for investigation. After some time had passed away, I wrote to learn the results, and received the following reply:—"Dear Sir: At this distance of time I cannot venture to put down the result of the microscopic examination of the texture you gave me; but my impression is, that it was not decisive, for one of the most important specimens to be compared was unluckily left behind at your house in transferring the things from one bottle to another; and if I rightly recollect, what I examined with the microscope were supposed nerves in the broad ligament, about which you were less confident, and which seemed to me to be slender bundles of tendinous fibres. I may add, that the reasons for which I ventured respectfully to differ from you when you asked my opinion, were quite independent of microscopic evidence: nor do I rely on the test by acetic acid, which appears to me inapplicable to small branches of the sympathetic nerves. I am, &c., W. SHARPEY."—On the 3rd of September, 1841, at my request, Dr. Sharpey came and examined the preparation of the ganglia and nerves of the uterus, of which a representation has been given in the forty-first volume of the *Philosophical Transactions*. I made the following note in my journal immediately after his departure: "The ganglion at the cervix, nerves of bladder, vagina, rectum, all admitted, and the nerves proceeding from the ganglion to the bloodvessels and plexuses on the body of the uterus. He said he was anxious to admit nothing about which there could be any doubt; that when he lectured on the subject again, he would request me to take the preparations to his class, and show them to his pupils. This request was never made to me. Having completed the dissection of the gravid uterus, which has been figured in the *Philosophical Transactions* for 1842, I again requested Dr. Sharpey to examine the preparation; but he did not comply with this request, and during the last eight years Dr. Sharpey has seen none of my dissections.

On the 31st of May, 1841, Dr. Todd, then a member of the Committee of Physiology of the Royal Society, came to my house, and examined the dissections of a gravid uterus of four months, and two of the gravid uterus at the full period. "If seen in any other part of the body," he said, "he would have no doubt that they were all nerves which were displayed in the dissections: the nerves of the bladder and rectum most evident. Still he would admit nothing without seeing the tubular structure of the nerves in the microscope. He said there would be no difficulty in doing this, and then the evidence would be complete. He said, It is very wonderful; no attempt to say where nerves end and something else begins. Agreed to give him portions to examine with the microscope. On the 1st July, Dr. Todd had not completed the microscopic examination of the portions taken from the uterus of nine months." Whether the examination was ever begun or completed, and what results were obtained, I was never able to learn.

After the publication of my second Paper in the *Philosophical Transactions* in 1842, at one of the soirées of the Marquis of Northampton, Dr. Sharpey, with whom I had never been intimately acquainted, in a peculiarly abrupt manner, observed to me, that in three years I would give up, or be compelled to forego, all that I had published respecting the nerves of the uterus. "Have you found time to make a dissection of these nerves?" was my reply. He reluctantly confessed that he had not." About the same time, Mr. T. Snow Beck, who some years before had been a pupil of Dr. Sharpey and Mr. Quain, at University College, and had obtained an introduction to me, frequently called at my house, and I shewed him all my dissections of the nerves of the uterus. He expressed, as many others had done, the greatest interest in my inquiries, and led me to believe that he was thoroughly convinced that the new structures displayed were ganglia and nerves. Having expressed a desire to dissect the parts himself, I willingly gave up to him, as he has stated, the uterus of a woman who had died soon after delivery from hæmorrhage. After a considerable period, I was invited to see the progress he had made, and

was extremely mortified to find that the uterus was immersed in foul spirit and water, and in a half putrid state. He informed me that the diluted alcohol was supplied by University College, at the request of Dr. Sharpey, and that the expense already incurred was so great, that he was afraid to solicit another supply, and that pure alcohol was out of the question. On examining the preparation, I found that the great bloodvessels, with all their accompanying ganglia and nerves, had been cut away, and that the right hypogastric ganglion had been torn into pieces. I pointed out these circumstances, and hinted that he had stumbled at the threshold by destroying the ganglion, and lost the key to the whole nervous system of the uterus. I advised him to procure a proper supply of alcohol, and examine the left side of the uterus, which was undisturbed, where he could not fail to find the ganglia and nerves I had repeatedly demonstrated to him, and he had acknowledged, to exist. This proposal was met (in a disrespectful manner) with a flat denial that any ganglia existed at the neck or nervous structures on the body of the uterus, such as I had represented. I immediately discovered the manner in which Dr. Sharpey's prophecy was about to be fulfilled.

In the spring of 1845, being aware that the scheme which had been devised for the destruction of the nervous system of the uterus, and, as was expected, of my character as a scientific observer, was now fully ripe for execution, I presented to the Royal Society the following very brief note, entitled "Supplement to a Paper on the Nervous Ganglia of the Uterus," which was read to the Society at a meeting held on the 19th of June. The object in this was to warn the Council against the proceedings.—"In the First Part of the *Philosophical Transactions* for 1841, I have described and represented in two engravings the nervous ganglia, situated on the sides of the neck of the uterus, in which the great sympathetic and third sacral nerves unite, and from which branches proceed to the vagina, bladder, rectum, and the whole of the lower part of the uterus. In an Appendix to that paper, published in the Second Part of the *Philosophical Transactions* for 1842, there is contained a further account of the nervous structures situated on the fundus and body of the uterus, and an engraving in which the appearances they present at the full period of gestation have been accurately delineated. From the form, colour, vascularity, and general distribution of these structures, and from their branches actually coalescing, and being continuous with those of the great sympathetic and spinal nerves, I inferred that they were true nervous ganglionic plexuses, and formed the nervous system of the uterus enlarged during pregnancy. In a gravid uterus at the full period, I have recently, and with still more care, traced the great sympathetic and spinal nerves into the two hypogastric ganglia, and from thence over both sides of the uterus to the fundus. A lens which magnified six diameters was employed in this dissection, which enabled me with unerring certainty to distinguish and to separate the nervous filaments from the fine cellular membrane by which they are so closely surrounded, and from all the other contiguous structures. In this minute dissection, many of the details of the nervous system of the uterus are more perfectly shown than in any previous dissection made by me, and they confirm, in the most complete manner, the accuracy of all that is contained in my previous communications on this subject to the Royal Society. To this preparation I can now appeal, as affording a perfect demonstration of the truth of all my statements respecting the ganglia and other nervous structures of the uterus."

At the same meeting of the Society, (19th June,) the title of a paper "On the Nerves of the Uterus," by Mr. T. Snow Beck, was read. No part of the paper was read, except the title; indeed, the greater part of it was not even written. On the 3rd of July, the next meeting of the Committee of Physiology took place, when there were present, Sir B. Brodie, Dr. Sharpey, Dr. Todd, Mr. Bowman, and Mr. Gray. Mr. Beck's embryo paper, which had neither been read to the Royal Society, nor presented to it, was referred to Dr. Sharpey and Dr. Todd. My Supplement was not referred in the ordinary manner, to ascertain whether it had any merit, and whether it should be recommended to the Council to be printed or blackballed. The Supplement suddenly disappeared from the scene, and where it lay hid during the ensuing four months has not yet been discovered. Professor Christie informed me that he had sent it to the Committee of Physiology. Mr. Bell, the Secretary of the Committee, stated that my paper was never in his possession, nor had he seen it, in his official capacity, excepting on the table of the Committee. I was led to believe, from the following memorandum, that it might, in the months of July, August, September, and October, have passed through the hands of Dr. Sharpey and Mr. Quain.—"*Memorandum*: Professor Retzius observed, having just left Dr. Sharpey and Mr. Quain, that they had said, in reference to

Dr. R. Lee's recent dissections of the nerves of the uterus, that there was no doubt that they were nerves. The only question was,—Whether the recent dissections displayed the same nerves as his former ones: and with regard to Mr. Beck's dissections, whether they displayed nerves not previously shown by Dr. Lee. Professor Retzius himself had no doubt of Dr. Lee's dissections being the display of nerves.—MARSHALL HALL. August 15th, 1845.”—“Dr. Hall to Professor Retzius: The question is, Are what Dr. Lee shows *nerves* or not? What do you say, Professor Retzius. Yes or no?—Professor Retzius: I say ‘Yes.’”—Had Dr. Sharpey and Mr. Quain taken the trouble to look at my recent dissections, they would have seen that they displayed the same ganglia and nerves as my former dissections, but more distinctly, and that the claim they were thus bringing forward to Professor Retzius, in favour of their pupil, was completely without foundation. Professor Retzius was not granted an opportunity of comparing the two dissections of their pupil with mine, and publicly bearing that testimony to the truth which he would have done.

The next meeting of the Committee of Physiology took place on the 27th October, pursuant to a summons, which stated, that, besides other business, the recommendation of a paper for the award of the Royal Medal in Physiology for 1845, was to be considered. The committee having met, Mr. Lawrence, in the absence of the chairman, Sir B. Brodie, took the chair. After some part of the business had been transacted, Dr. Roget stated to the meeting, that it was a mistake in the summons that the recommendation of a Royal Medal in Physiology was to be considered; that there was no Royal Medal in Physiology for 1845, and that therefore there was no further business before the Committee. Upon this announcement, Mr. Lawrence, having twice put the question, whether or not there was any further business, duly dissolved the meeting, and left the chair. After the meeting had been thus dissolved, Mr. Lawrence left the apartments of the Royal Society, but all the other members who had been present at the meeting remained. After Mr. Lawrence had left, some one referred to the announcements regarding the Royal Medals in the *Philosophical Transactions*, when it was discovered that, as stated in the summons to the members of the Committee convening the meeting which had just been dissolved, a Physiological Medal did fall to be awarded in 1845. This discovery having been made, the members of the Physiological Committee who had been present at the meeting duly convened and constituted,—but which Mr. Lawrence, the chairman, had dissolved, and who still remained in the apartments of the Royal Society,—sat down, placed Dr. Todd in the chair, and proceeded to determine what paper should be recommended to the Council for the award of the Royal Medal in Physiology, as if they had constituted a meeting of the Physiological Committee duly convened. The following is copied from the Journal Book of the Committee of Physiology:—

“Committee of Physiology, Oct. 27, 1845.

“Present: Mr. Lawrence, in the chair. Dr. Bostock, Dr. Todd, Dr. Roget, Mr. Bowman, Mr. Kiernan, Mr. Bell, and Dr. Sharpey.—It was resolved: That Mr. Wilson's paper ‘On the growth and development of the epidermis’ be not recommended to be printed in the *Transactions*.—It was resolved: That Mr. Wharton Jones's paper ‘On the blood corpuscles, considered in the phases of their development,’ be recommended to be printed.—It was resolved: That Professor Purkinje be recommended to the Council to be proposed as a foreign member.—It was resolved: That the Council be recommended to award the Copley Medal to Professor Owen, for his work on the intimate structure of the teeth, entitled *Odontography*; and on account of his various other important contributions to comparative anatomy and physiology.”

[Committee dissolved and broken up.]

“Mr. Lawrence having left the Committee, the chair was taken by Dr. Todd, and the Committee proceeded to consider the award of the Royal Medal. The following papers were named:—Dr. Barry, on Spermatozoa observed in the mammiferous ovum.—Mr. Arthur Farre, on the organ of hearing in the Crustacea.—Mr. Newport, on the circulation of the Myriapoda.—Dr. Davy, on animal heat.—Mr. Newport, on the reproduction of lost parts in insects.—Mr. Simon, on the comparative anatomy of the thymus gland.—Mr. Wilson, on the parasitic animalcules in the sebaceous follicles.—Mr. Matteucci's electro-physiological researches.—Mr. Wharton Jones, on the blood corpuscles.—Mr. Addison, on some peculiar modifications of the force of cohesion.—Mr. Rigg, on the

formation and secretion of alkaline earths.—Mr. Stephenson, on the theory of vision. Mr. Wilson, on the growth and development of the epidermis.—Mr. Beck, on the nerves of the uterus.—Dr. Lee's Supplement to his paper on the nervous ganglia of the uterus.—Dr. Davy, on the temperature of man.—It was resolved: That the Council be recommended to award the Royal Medal in Physiology to Mr. Beck, for his paper 'On the nerves of the uterus.'—Dr. Lee's Supplement to his paper on the nervous ganglia referred. WM. LAWRENCE."

On the 30th of October the Council met. Present: the Marquis of Northampton, Dr. Bostock, Mr. Bowman, Sir W. Burnett, Mr. Christie, M. Dollond, Dean of Ely, Mr. Graham, Sir J. Lubbock, Dr. Roget, and Dr. Sharpey. At this meeting "It was resolved, that one of the Royal Medals be awarded to T. S. Beck, Esq., for his paper entitled, on the nerves of the uterus." The Council then resolved itself into a Committee of Papers, to determine whether the paper to which the Medal had been awarded should be inserted in the *Philosophical Transactions*. On the 6th of November, the Committee of Physiology met, and the minutes of both the legal and the illegal meetings which had been held on the 27th October were duly confirmed. Sir B. Brodie, the referee on my Supplement, recommended that it should be printed, whereupon the Committee immediately "Resolved, that Dr. Lee's Appendix be not recommended to be printed." The Council met the same day, and the minutes of their meeting held on the 30th October were read and confirmed. My Supplement was then formally blackballed, and no doubt it must have imagined at that awful moment that its romantic adventures and mortal career had closed, and that it was doomed to lie ingloriously buried for ever in the archives. I became acquainted with the whole of these proceedings on the morning of the 7th November. Mr. Lawrence informed me that he had dissolved the Committee of Physiology on the 27th October, and that the meeting was entirely broken up; that he had left Somerset House before the award of the Royal Medal was considered, and that several members had afterwards held a meeting, and recommended the award to the Council. On the 7th of November, in an interview which I had with the President, I stated to his lordship that the award had been made without investigation, and that the recommendation to the Council had not proceeded from the Committee of Physiology, but from an illegally constituted meeting, after the Committee had been dissolved by the chairman. "His lordship replied, that the Council had awarded the Medal on its own responsibility; that it was at perfect liberty to decide independently of the Committee; and that it was of no consequence whether the recommendation came to the Council from the Committee regularly constituted, or the minutes of the meeting had been confirmed. The Medal has been awarded, added the President; the thing is done, and it is too late to say anything more about it." On the 13th of November I addressed the following letter to Dr. Roget. "You were present, I believe, at the meeting of the Physiological Committee when it was recommended to award the Royal Medal to Mr. Beck. Did it not occur to you that it would have been proper to have compared the dissections of Mr. Beck with those I had recently made, before coming to a decision, which will have the effect of making it appear that my descriptions and delineations of the nerves of the uterus are incorrect?"

"MY DEAR SIR,

"18, UPPER BEDFORD PLACE, November 13, 1845.

"The Committee of Physiology had received, before they came to the decision respecting the award of the Royal Medal, which you refer to in your letter of this morning, two separate Reports on Mr. Beck's paper, drawn up by the referees to whom it had been sent for examination, and for their opinion of its merits; and the recommendation by the Committee of the award of one of the Royal Medals to the author of the paper was made after these Reports had been read to them, and taken into their consideration, at one of the fullest meetings of that Committee we have ever had. These Reports being confidential, I am not at liberty to communicate to you, but as there will probably soon be another meeting of the Committee, I will not fail to read to them your letter of this morning. I am, &c.

"P. M. ROGET."

I called upon Dr. Roget after receiving this letter, but he referred me to the Council for any explanation of the affair I might desire. When I informed him that the proceedings were illegal, he appeared greatly confused, and confessed that he was the cause. He mistook a Physical for a Physiological Medal. I observed that it was a very strange mistake, and that if I had not known him for twenty years, and believed him to be a man of

honour, I should have regarded it as a premeditated trick. He assured me that it was a mistake, and begged me to write to the Council. Instead of writing to the Council I wrote to him, and sent a copy of the letter to the President.—“4, Savile Row, November 17, 1845. My dear Sir: Having been two years in the Council of the Royal Society, I am aware that none but members of the Council have a right to know what has taken place at the meetings before the decisions are publicly announced. I cannot, therefore, with propriety, send any statement to the Council, as you recommended me to do. Having acquainted you, one of the principal office-bearers and guardians of the honour of the Royal Society, with the unprecedented and illegal proceedings in the Physiological Committee, it is for you to determine whether the Council, in ignorance of what has occurred, shall be permitted to proceed in a course injurious to the moral character of the Royal Society, and destructive of my scientific reputation. I remain, &c.

ROBERT LEE.”

Soon after this the President sent a requisition to the Committee of Physiology, ordering them to state the grounds upon which the award had been recommended. The Committee met on the 20th November, when there were present, Sir B. Brodie, Dr. Bostock, Mr. Christie, Mr. Gray, Mr. Owen, Mr. Lawrence, Dr. Roget, Dr. Todd, and Dr. Sharpey. “Resolved, that Dr. Sharpey and Dr. Todd be requested to draw up a Report on the claims of Mr. Beck’s paper on the nerves of the uterus, to the award of the Royal Medal, and that Mr. Beck’s paper be sent in succession to the several members of the Committee of Physiology resident in London.” Dr. Todd and Dr. Sharpey had already drawn up two separate Reports, “and the recommendation by the Committee of the award of one of the Royal Medals to the author of the paper was made, according to Dr. Roget, after these Reports had been read to them, and taken into consideration at one of the fullest meetings we have ever had.” What had become of these Reports? Mr. Bell has thrice affirmed that the whole statement was “*untrue* ;” that there were no reports produced or read on the 27th October. If the two separate Reports said by Dr. Roget to have been read after the mistake, were in existence, they were now set aside, as not sufficiently laudatory for the extraordinary and unexpected emergency which had occurred. It became necessary to frame a Report which would at once overwhelm all opposition by the extravagant praise lavished on the fortunate paper: it being impossible that any contradiction could be given, however unfounded the allegations might be in the Report, until the disloyal deed was accomplished. All Europe, it was vauntingly stated, waited in eager expectation for the birth of the embryo paper, which was to demonstrate to the world that the uterus has no ganglia, and only a few small filaments of nerves, like sewing threads, which decrease during pregnancy. The “False Report of the Committee of Physiology” is now the term by which the document produced on this occasion is designated and universally known to the medical profession throughout Great Britain.

At this meeting Mr. Lawrence requested the Secretary to show him the paper, when it was discovered not to be in the possession of the Secretary, but of the author. The following is Statute V., Chapter XIV., in the printed Statutes of the Royal Society:—“All the papers read at the Society in the course of each year, and not withdrawn by the leave of Council, shall be delivered to the Committee of Papers, and shall be preserved for future inspection: and shall *never* be lent out of the Society’s house, without order of the Council.”

On the 27th of November, the Committee met, when the Report of Dr. Sharpey and Dr. Todd was read and adopted. “What is the character of this Report,” said Mr. Wharton Jones, on the 11th February, 1847, “on the strength of which the Council did re-vote the award? The Report, my Lord, does not truly represent the paper; the Report is not justified by the contents of the paper; but, as your Lordship is aware, does, as I have stated in a communication to the Council, contain allegations, some of which betray ignorance on the part of the Physiological Committee, whilst others are altogether inconsistent with common matter of fact.”

At this meeting of the Committee it was moved by Mr. Gray: “That the minute of the 27th October, recommending Mr. Beck’s paper for the Royal Medal, be rescinded, the same having been passed when the Committee was not regularly constituted.” This was negatived. Mr. Gray then entered the following protest against the award, which has not, however, been recorded in the Journal Book of the Committee. “The undersigned does not concur in the recommendation that the Royal Medal be given to Mr. T. S. Beck, for his paper on the nerves of the uterus, inasmuch as that paper appears to him to consist merely of the anatomical details of two dissections:

one of the uterus some time after parturition, and the other of the uterus immediately after parturition, without any attempt at generalization, and without any statement of physiological inferences. In one instance, an important fact is avowedly left unascertained, in consequence of an injury during the progress of the dissection, which might easily have been remedied by the dissection of another body, and the anatomical investigation of the virgin uterus, which is essential to the completion of the observations, has been left wholly neglected. For these reasons, and in conformity with the established practice of the Royal Society, in which it has ever been the rule to abstain from giving an opinion on any disputed point of fact, the undersigned is desirous of recording his protest against the recommendation that the Medal be awarded to an incomplete, purely descriptive, anatomical paper on a subject which is still in controversy."

On Monday, the 1st of December, 1845, the Council, the legal existence of which had terminated on the 30th November, met, when the Marquis of Northampton, Dr. Roget, Dr. Sharpey, Mr. Bowman, Mr. Owen, and other members, were present. The Report of Dr. Sharpey and Dr. Todd was read. "Read letters from Mr. Wharton Jones and Dr. Robert Lee on the subject of the award of the Royal Medal." "Resolved: that the Royal Medal in Physiology for the present year be awarded to T. S. Beck, Esq., for his paper, entitled, 'On the Nerves of the Uterus,' ordered for publication in the *Philosophical Transactions*." In less than an hour after, without the knowledge or sanction of her Majesty, and before the resolution had been confirmed, the Medal, in effigy, was given away by the President. "The recommendation for a Royal Medal proceeds from the Council to the Queen, and her Majesty presents it, or awards it, on their recommendation or petition." No such petition or recommendation had proceeded from the Council to the Queen, when the imaginary Medal was presented. Not only was the Royal Medal thus disposed of without the knowledge or sanction of the Queen, but in direct violation of the regulations approved by her Majesty for the award of Royal Medals, as has been announced annually in the *Philosophical Transactions*, since her Majesty ascended the throne. "Her Majesty, Queen Victoria, in restoring the Royal Medals, has been graciously pleased to approve the following regulations for the award of them: 'That the Royal Medals be given for such papers only as have been presented to the Royal Society, and inserted in their *Transactions*.'" The paper in question was not printed till eight or nine months after these transactions had taken place. The paper in the Archives and the paper in the *Philosophical Transactions* are different papers; the greater part of the latter was printed without the sanction of the Council.

"To the President and Members of the Council of the Royal Society of London.

"MY LORDS AND GENTLEMEN,

"4, SAVILE ROW, December 1, 1845.

"I feel compelled to protest against the Council's award of the Royal Medal, from the conviction that by doing so I shall vindicate the truth, which is now assailed, and prevent the Council from committing an error which will reflect signal discredit on the Royal Society itself. The first ground for this protest is, that not one member of the Physiological Committee, except Mr. Lawrence, has examined my two recent and most perfect dissections of the nervous system of the uterus, which were described by me in a paper read to the Royal Society at the last meeting in the month of June, and which paper, contrary to the recommendation of the referee, (Sir B. Brodie,) has been refused a place in the *Philosophical Transactions*. Drs. Todd and Sharpey having, therefore, never seen these dissections, nor the dissection figured in the *Philosophical Transactions* in 1842, though requested by me to do so, have consequently framed their Report with an imperfect knowledge, or rather, in a state of total ignorance, of what had previously been done by me on the subject: which Report has nevertheless been adopted by the Physiological Committee, and made the ground of a recommendation for this award. The Council cannot fail to perceive that an examination of all my dissections ought to have been made by Drs. Todd and Sharpey before any fair and just report could be drawn, much less a recommendation to the Council for the award of the Royal Medal. The second reason for my protest is, that this award casts a doubt on the accuracy of my descriptions and delineations of the nerves of the uterus in the *Transactions of the Royal Society*. More than fifty distinguished English and Foreign anatomists have carefully examined my dissections, which first displayed this great nervous system, and have borne testimony in writing to the truth of my published statements.

Many of these anatomists are Fellows of the Royal Society, and much superior in scientific reputation to the individuals who, without examination, have urged the Physiological Committee to recommend this award. A third reason which I have to assign to the Council for this protest is, that the recommendation of the Physiological Committee was made in a hasty and irregular, if not in a positively illegal manner—a manner calculated to excite suspicions respecting the motives of those who have been most active in promoting this award. A fourth ground for protesting against this adjudication is, the established practice of the Royal Society, in which it has ever been the rule to abstain from giving an opinion on any disputed point of fact, or deciding on a subject which is still in controversy. For these reasons I beseech the Council of the Royal Society to suspend this award, until all the circumstances detailed in this protest have undergone a rigid and impartial investigation. The interests of science, and the honour of the Royal Society itself, render an inquiry imperative upon the Council. I have the honour, &c.

“ROBERT LEE.”

After this letter had been read to the Council, in which the interests of science and the honour of the Royal Society were wholly disregarded, my Supplement, which had passed through so many strange vicissitudes—first read, then abstracted, then suppressed, then put in competition for a Royal Medal, then referred, then reported on favourably, blackballed by the Committee of Physiology and by the Council of the Royal Society on the same day, and lastly, consigned to the gloomy shades of the Archives—suddenly and most mysteriously reappeared on the stage, and proclaimed to the world, through the *Philosophical Transactions*, in the face of its enemies, the truth of every statement I had made to the Royal Society respecting the ganglia and other nervous structures of the uterus.

Four months afterwards, the following correspondence took place:—

“*To the President and Council of the Royal Society of London.*”

“MY LORDS AND GENTLEMEN,

“4, SAVILE ROW, April 2, 1846.

“In the printed Address of the President, delivered at the last anniversary meeting of the Society, it is stated that the Royal Medal had been adjudged by the Council, ‘complying thereby with the recommendation of the Committee of Physiology.’ It is proved by the following statement of facts that no recommendation was made by the Committee of Physiology to the Council for such an award; and that the statutes of the Society and regulations ordered by the Crown for the award of Royal Medals have been violated by the late Council. On the 27th of October last, the Committee of Physiology met. Mr. Lawrence, who had been the referee on all my papers on the nerves of the uterus, published in the *Philosophical Transactions*, was president of the committee on that occasion. When the Committee had recommended the Council to award the Copley Medal to Mr. Owen, and transacted other business, the secretary informed Mr. Lawrence that there was no further business before the Committee to transact, on receiving which intimation Mr. Lawrence dissolved the meeting, and left Somerset House. No sooner had the President taken his departure, than the remaining members of this dissolved Committee re-formed themselves; Dr. Todd took the chair; and the meeting, thus re-constructed, proceeded to consider the award of the Royal Medal in Physiology. Fifteen papers were named or put in competition for the Medal. One of these was my Supplement to a paper on the nervous ganglia of the uterus, which had been read to the Society on the 19th of June, and which contained additional and important evidence in confirmation of the accuracy of my descriptions and delineations of the nerves of the uterus in the *Transactions* of the Royal Society. This paper had remained unREFERRED four months, after having been read to the Society. Another paper put in competition for the Medal was one, on the nerves of the uterus, by Mr. Beck, which had never been read to the Society, but had been referred, on the 3rd of July, to Drs. Todd and Sharpey. Two separate Reports from Drs. Todd and Sharpey were produced and read, and then this meeting ‘resolved to recommend the Council to award the Royal Medal to Mr. Beck.’ After this transaction, the next act of this meeting was to refer my Supplement to Sir B. Brodie, to ascertain whether it was worthy of publication. Sir Benjamin recommended the Committee of Physiology to print the paper; but the Committee, on the 6th of November, ‘Resolved, that Dr. Lee’s Appendix be not recommended to be printed.’ On the 30th of October, the Council of the Royal Society met,

and, on the recommendation of the re-constructed meeting held three days before, 'Resolved, that one of the Royal Medals in Physiology be awarded to T. S. Beck, Esq., for his paper, entitled, 'On the nerves of the uterus.' The Council then resolved itself into a Committee of Papers, to determine whether the paper to which the Royal Medal had just been awarded was fit to be printed. The Medal was awarded to a paper which had never been read to the Society, and had not been ordered to be printed. On the 7th of November, in an interview which I had with the President, I stated to his Lordship that the award had been made without investigation, and that the recommendation to the Council had not proceeded from the Committee of Physiology, but from an illegally constituted meeting, after the Committee had been dissolved by the chairman. His Lordship replied, that the Council had awarded the Medal on its own responsibility; that it was at perfect liberty to decide independently of the Committee; and that it was of no consequence whether the recommendation came to the Council from the Committee regularly constituted, for the minutes of the meeting had been confirmed. The Medal has been awarded, added the President; the thing is done; and it is too late to say anything more about it. About the middle of November, the President sent a requisition to the Committee of Physiology, ordering them to state the grounds upon which they had recommended the award of the Royal Medal in Physiology. On the 20th of November, the Committee met, and 'Resolved, that Dr. Todd and Dr. Sharpey be requested to draw up a Report on the claims of Mr. Beck's paper to the award of the Royal Medal, and that Mr. Beck's paper be sent in succession to the several members of the Committee of Physiology resident in London.' At this meeting Mr. Lawrence requested the secretary to show him Mr. Beck's paper, but it was not forthcoming; and the secretary stated that it was in the author's possession, contrary to a statute of the Society, enacted expressly for the purpose of preventing the perpetration of literary and scientific frauds. On the 27th of November, the Committee met, when the report of Drs. Sharpey and Todd was read and adopted. On the 1st of December, this Report came before the Council, and it has been printed in the Proceedings of the Society, and in the Address of the President at the anniversary meeting, as if it had been the true report of the Committee of Physiology on the claim of Mr. Beck's paper to the award of the Medal. That such is not the fact can readily be proved, for the Medal was awarded by the Council a month before, and on the recommendation of the re-constructed meeting on the 27th of October, when two other Reports were produced, and read by Drs. Todd and Sharpey, which Reports, Dr. Roget states, 'are confidential,' and have not yet seen the light. The following notice is affixed to the First Part of the *Philosophical Transactions* for 1845; and the same notice has been affixed to every volume of the *Philosophical Transactions* published since 1837: 'Her Majesty, Queen Victoria, in restoring the Royal Medals, has been graciously pleased to approve the following regulations for the award of them: "That the Royal Medals be given for such papers ONLY as have been presented to the Royal Society, and inserted in their *Transactions*.'" The Medal in Physiology was awarded by the late Council to a paper which had never been read to the Society, and has not been inserted in the *Philosophical Transactions*. I can now demonstrate that the highest honours of the Royal Society have been conferred for destroying, and not for displaying, the nerves of the uterus. If the Council will appoint a competent tribunal to investigate the subject, the truth of what is affirmed will speedily be discovered, and the injury inflicted on anatomical and physiological science, by these irregular, unjust, and most unphilosophical proceedings, be repaired. The moral character of the Royal Society requires that a rigorous examination be made, without delay, of the whole of these extraordinary transactions.—I am, &c.

"ROBERT LEE."

"Dr. Roget to Dr. Lee.

"SIR,

"ROYAL SOCIETY, SOMERSET HOUSE, April 3, 1846.

"I am instructed by the President and Council of the Royal Society to inform you, in reply to your communication, that they do not consider themselves authorized to revise the grounds on which a Royal Medal has already been awarded; and I am further directed to communicate to you a resolution which they have adopted, with a view to the prevention of future difficulties in the awards of the Royal Medals, and I accordingly enclose a copy of that resolution.—I am, &c.

"P. M. ROGET, Secretary."

A Special General Meeting of the Royal Society was held on the 11th February, 1847, in accordance with

the following requisition:—"We, the undersigned, Fellows of the Royal Society of London for improving natural knowledge, do hereby, in conformity with the statute, c. 12, s. 2, require a Special General Meeting of the Society to be convened, for the purpose of considering and determining on the legality of the circumstances under which the award of the Royal Medal in Physiology for 1845 was first recommended by the Physiological Committee, and under which it was actually made by the President and Council.—T. Wharton Jones, Richard Bright, James Copland, James Clark, J. R. Martin, Robert Lee, W. Frederick Chambers, John Webster, Marshall Hall, Robert E. Grant, George Gulliver."

At this meeting, after the minutes of the Committee of Physiology of the 27th October, 1845, had been read, "Mr. Wharton Jones resuming, said:—If what has now been read be a correct record of what took place at the meeting of the Physiological Committee on the 27th October, 1845, then what I have stated in regard to the meeting of the Committee having been dissolved by Mr. Lawrence, must be incorrect. At this stage of Mr. Wharton Jones's statement, Mr. Lawrence rose and said that he understood that Mr. Jones intended to ask him some questions as to what took place at the meeting of the Committee of Physiology on the 27th October; he therefore begged that Mr. Jones would now ask them, as he was called away by a pressing engagement. On this Mr. Jones resumed, and said, My Lord, the questions which I wish to ask Mr. Lawrence are: whether he dissolved the meeting of the Physiological Committee on the 27th October, 1845, at the time he left the chair, or whether, as the minutes would make it appear, he simply transferred the chair to Dr. Todd? To these questions Mr. Lawrence unhesitatingly answered, that he did dissolve the meeting. Mr. Jones resumed—From what Mr. Lawrence has stated to the meeting, it appears that when he left the chair he dissolved the meeting.—(Here Mr. Jones was interrupted by one of the Secretaries, Mr. Christie, who said, '*Not dissolved, but adjourned—adjourned.*') On this interruption, Mr. Jones turned to Mr. Lawrence, and repeated his former question, and Mr. Lawrence distinctly answered, '*I dissolved the meeting;*' and then added, '*the meeting was broken up.*' And to a question from Mr. Warren—viz., whether, supposing there had been more business brought forward, he could have stayed longer at the meeting, Mr. Lawrence answered, 'I could have stayed longer had there been any business to transact.' This question was twice repeated by Mr. Warren, and received the same answer. Mr. Jones resuming, went on to say:—It being thus proved that when Mr. Lawrence left the chair he dissolved the meeting, it is quite evident that all that has been read from the minute-book of the Committee of Physiology of what took place subsequently, is no record of any part of the proceedings of the Physiological Committee at their meeting of the 27th October, 1845, but mere unauthorized interpolation, and as such ought forthwith to be erased."

"I now come (said Mr. Jones) to the evidence as to the circumstances under which the award of the Royal Medal was actually made by the President and Council. This I will arrange under three heads—viz., evidence as to the circumstances under which the award of the Royal Medal was for the first time voted by the President and Council; evidence as to the circumstances which led to the Report I have already referred to being drawn up; and evidence as to the circumstances under which the award was for a second time voted, and the Medal given away before the vote was confirmed. In reference to the circumstances under which the award was for the first time voted by the President and Council, I would beg that the minutes of the meeting of the Council on the 30th October be read. (*The printed minutes were read, and found to contain nothing relating to the award.*) That the award of the Medal was voted by the President and Council at the meeting of the 30th October, 1845, does not appear from the minutes which have now been read. But that it was so voted, I believe has not been denied—it has, indeed, been repeatedly admitted. Here the noble President rose and admitted that the award had been voted on the 30th of October, but that when the irregularities connected with the recommendation of Mr. Beck's paper for the award became known to the Council, they rescinded the resolution, and erased the minute. Mr. Jones resumed:—It thus appears that the resolution come to by the Council on the 30th of October, to award the Royal Medal in Physiology to Mr. Beck, was rescinded, and the minutes erased."

The date of this illegal and clandestine transaction and its purpose was not only not stated by the President, but so carefully concealed, that not the slightest suspicion existed before the 11th of February, 1847, that the resolution of the 30th of October, 1845 (and confirmed on the 6th of the following month) had been actually *erased* from the Journal Book of the Council, thereby rendering the *award null and void*.

"The noble President," said Dr. Webster, "having stated that the Royal Medal in Physiology was not awarded by the Council till the 1st of December, 1845; and that all previous proceedings on the matter had been set aside, he, therefore, thought this was not a legal award; 1st, because the resolution had not been confirmed before the Medal was given away; and 2ndly, because the meeting of the 1st of December could not make such award, as he doubted its being a properly constituted Council. He entertained this opinion on the grounds that, at the anniversary meeting held on the 30th of November, 1844, the officers and Council were only elected for the ensuing year, as stated by Dr. Roget on the part of the Scrutators on the day of election; and in the *Philosophical Transactions*, where the list was published, a note with three asterisks appears immediately under the names of the new Council, stating, 'This Council will continue till November 30th, 1845.' Such being the facts, the meeting alluded to could not make any award after the period for which the Council was elected had passed, seeing that the powers delegated to them by the Society at the former anniversary had ceased and determined on the 30th November previously. Therefore, according to his judgment, (and it is the opinion of eminent counsel,) the award made on the 1st of December, 1845, was not valid for the reasons adduced; and he considered that the Royal Medal consequently had lapsed to the Crown. The first award was rendered *null and void*: the second was illegal and invalid."

It was moved by Mr. Wharton Jones, and seconded by Dr. Copland,—“That it is the opinion of this special general meeting that the award of the Royal Medal of Physiology for 1845 was made under circumstances characterized by great irregularity, and in violation of Her Majesty Queen Victoria's regulations—viz., ‘that the Royal Medals be given for such papers only as have been presented to the Royal Society and inserted in their *Transactions*;' and that, therefore, the said award ought to be considered as null and void:” upon which the following amendment was moved by Mr. Gray, and seconded by the Rev. R. Sheepshanks,—“That whereas, the President of the Society has already expressed from the chair an opinion on the irregularity which attended the award of the Royal Medal in 1845, and whereas the Council issued new Regulations with regard to the Royal Medals, as soon as they discovered that those enacted in 1838 were inconsistent with the terms of the Royal Grant: it therefore does not seem expedient to the present meeting that any further proceedings shall be taken in the matter;” which amendment, being put from the chair, was carried.

In 1846 I presented to the Royal Society two papers on the ganglia and nerves of the uterus, both of which repose in the Archives, and copies of them cannot be procured without permission of the Council, which I have not sought to obtain. The second paper was entitled “*On the Ganglia and Nerves of the Virgin Uterus*,” and was read on the 26th November, 1846. The following is the abstract from the printed proceedings of the Royal Society:—“The author states that his recent dissections have enabled him to verify the descriptions he gave of the ganglia and nerves of the uterus in his papers already published in the *Philosophical Transactions*, and also to detect the existence of ganglia situated in the muscular coat of the uterus, and plexuses of nerves accompanying all the bloodvessels and absorbents ramifying in its walls between the peritoneum and the lining membrane. By examining the heart of a fœtus of a child of six years of age, of an adult in the sound state, a human heart greatly hypertrophied, and the heart of an ox, he found that there exists a striking analogy between the ganglia and nerves of the uterus and those of the heart. He ascertained by microscopic examination, that the muscular and vascular structures of the auricles and ventricles are endowed with numerous ganglia and plexuses of nerves, which, as far as he knows, have not yet been described, and which enlarge simultaneously with the natural growth of the heart, and also continue to enlarge during its morbid conditions of hypertrophy. The author also finds that the size of the ganglia and nerves of the left auricle and ventricle in the normal state is more than double that of the corresponding parts on the right side. A description is then given of two elaborate drawings which accompany the paper.” These drawings have since been engraved at my own expense, and form Plates I. & II. of these Memoirs.

At the close of 1847 I addressed the following letter to the Marquis of Northampton:—

“MY LORD MARQUIS,

“4, SAVILE ROW, BURLINGTON GARDENS, December 22, 1847.

“The illegal and unjust transactions which took place in the Committee of Physiology of the Royal Society in 1845, have thrown a deep stain on the moral character of the Society, which must be wiped away. It is impossible

that any institution can prosper when the purposes for which it was originally founded have been so grievously perverted.

"You are, my Lord Marquis, the President and Guardian of the honour of the Royal Society, and are fully impressed, I am persuaded, with the necessity of preserving this great and venerable tribunal of science pure and unspotted in the eyes of all nations. As a fellow of the Royal Society, and bound by the same obligation as your Lordship 'to promote its good,' I once more beseech you to unite with the Council, and at its first meeting restore to the Council Book of the Society the minutes which were unlawfully erased after confirmation in the month of November, 1845, and to rescind the resolution passed by the Council on the 30th of October, and the 1st of December, 1845, relative to the award of the Royal Medal in Physiology, which award was made in direct violation of the regulations established by her Majesty Queen Victoria for the award of Royal Medals, as announced in the *Philosophical Transactions*.

"His Royal Highness the Duke of Sussex declared from the chair which your Lordship now occupies, that the results of the labours of men of science would not pass unnoticed and unrewarded at the Royal Society, and assured them that there exists a 'tribunal to which they may appeal, or before which they may appear, whose decision is always for honour.' If your Lordship and the Council refuse to restore to the Council Book the erased minutes which had been confirmed, and to rescind the illegal award, the Royal Society will cease to be regarded by men of science as a tribunal to which they can appeal, and before which they can appear, without incurring the danger of having 'the most important discoveries or series of investigations completed and made known to the Royal Society,' and published in the *Philosophical Transactions*, rewarded with injustice and dishonour.

"It is my earnest desire that a public inquiry into the whole of these proceedings may be avoided. Will your Lordship have the goodness to inform me, at your earliest convenience, whether you determine to recommend the Council to grant or to reject my earnest and just request. I am, my Lord Marquis, your faithful and obedient servant,

"ROBERT LEE.

"To the MARQUIS OF NORTHAMPTON, President of the Royal Society."

Lord Northampton to Dr. Lee.

"SIR,

"ALLSOP, December 30, 1847.

"I do not feel certain whether I ever answered your letter of the 22nd of this month. I write this in case I did not do so. If you wish me to do so, I will certainly bring your letter before the Council of the Royal Society at their next meeting, and they must decide on the propriety of complying with your request, or of not doing so. I cannot, however, undertake to recommend them to do that which is not, in my opinion, within their power—viz., to rescind the vote of a Medal by a former Council, although I quite admit that that vote was come to under a mistake, as to the Regulations of the Royal Donor. I confess I do not see why you should be anxious to restore a resolution for the purpose of rescinding it. Still I am ready to lay your letter before the Council, if you wish me to do so. I am, Sir, your humble servant,

"NORTHAMPTON."

Dr. Lee's reply.

"MY LORD MARQUIS,

"LONDON, 4, SAVILE ROW, December 31, 1847.

"In a letter of the 22nd instant, I requested your Lordship, in a respectful and earnest manner, to recommend to the Council of the Royal Society to restore to the Council Book the confirmed minutes which were erased in November, 1845, and to rescind the illegal resolution of the 30th of October, and 1st of December, 1845, relative to the award of the Royal Medal in Physiology.

"I regret extremely to learn from your Lordship's letter of the 30th instant, which I had the honour to receive this morning, that you decline complying with my request, and that you should have felt so little interest in the honour of the Royal Society, as to have forgotten in eight days whether or not you had answered my letter. I am, my Lord Marquis, your obedient servant,

"ROBERT LEE.

"To the MOST HON. THE MARQUIS OF NORTHAMPTON."

Lord Northampton to Dr. Lee.

"SIR,

"CASTLE ASHBY, January 3, 1848.

"I have received your letter of the 30th of last month, and by it I see that something that I said in my former letter must have given you offence, which I did not intend. I do not, however, see why you should accuse me of want of due regard to the honour of the Royal Society, on account of my not feeling sure whether or not I had answered your letter. You do not say whether you wish me to bring your application before the Council of the Royal Society; but as you do not say anything to the contrary, I presume that you do desire it, and I shall therefore think it my duty to bring it before them, and they must decide whether they think it right to accede to your request. I have already told you, that in my opinion it is not competent for them to overrule the award of a Medal by a former Council; but they may be of a different opinion. However that may be, you have a right to have your application laid before them. I think it right to mention to you, as I understood from you when I saw you, that you intended to contradict the erroneous statement in the *Lancet*, that I heard some little time ago, that no such contradiction had appeared there. Perhaps it may have been inserted since, or possibly the editor may not have received your letter. I am, Sir, your humble servant,

"NORTHAMPTON."

Dr. Lee's reply.

"MY LORD MARQUIS,

"LONDON, 4, SAVILE ROW, January 4, 1848.

"I am anxious that my letter of the 22nd of December should be read to the Council of the Royal Society at its first meeting; and I beg leave to suggest to your Lordship the propriety of consulting the Attorney and Solicitor-General on the legality of erasing minutes which had been confirmed from the Council Book of the Society, and the power of the Council to rescind resolutions passed by a former Council, which were at variance with regulations for the award of Royal Medals, framed by the Council, and established by the Queen. Before the Council enters upon the consideration of the request contained in my letter, the opinions of the law officers of the Crown ought certainly to be taken, and if the Council does not, I myself will be forced to do so.

"In a printed paper (anonymous) extensively circulated among the Fellows of the Society by Dr. Roget, at the Spécial General Meeting held on the 11th February, 1847, it is stated, 'October 30, the Council adopted this recommendation, and resolved that this award be made. [N.B.—The resolution to that effect was not confirmed at the next meeting, November 6, and was accordingly ordered to be erased from the minutes.]'

"Your Lordship is fully aware that this statement is incorrect, and that the resolution of the 30th of October was confirmed on the 6th of November, and remained confirmed on the 17th of November. I sent the contradiction to the medical journal immediately after my interview with your Lordship, and I shall send it again. I am, my Lord Marquis, your Lordship's faithful and obedient servant,

"ROBERT LEE.

"To the MOST HON. THE MARQUIS OF NORTHAMPTON."

Lord Northampton to Dr. Lee.

"SIR,

"NORTHAMPTON, January 7, 1848.

"I have received your letter of the 4th January, and will, in compliance with your request, lay before the next meeting of the Council of the Royal Society your letter of the 22nd of December, and also your suggestion respecting legal opinions. I am, Sir, your humble servant,

"NORTHAMPTON.

"Not having access at present to the Books of the Society, I can say nothing on the subject of confirmation and erasure."

Mr. Christie to Dr. Lee.

"DEAR SIR,

"ROYAL SOCIETY, SOMERSET HOUSE, January 20, 1848.

"The President having read to the Council of the Royal Society a correspondence between yourself and his Lordship, on the subject of the award of the Royal Medal for Physiology in the year 1845, I am instructed to communicate to you the unanimous resolution of the President and Council, 'That it is inexpedient to re-open the question.' I am, dear Sir, yours very faithfully,

"S. HUNTER CHRISTIE, SEC. R.S.

"DR. ROBERT LEE, &c. &c."

The foregoing correspondence closes this faithful Narrative of Proceedings in the Royal Society of London relative to these Memoirs on the ganglia and nerves of the uterus!

EXPLANATION OF THE PLATES.

PLATE I.

Represents the left hypogastric and sacral nerves entering the hypogastric ganglion, and the bloodvessels, ganglia, and nerves of the virgin uterus, a portion of the neurilemma being removed, and the size of the ganglia and nerves thereby greatly reduced below the natural size.

PLATE II.

Represents the right hypogastric nerve and ganglion, and the ganglia and nerves of the same virgin uterus, with a great part of the neurilemma dissected off. The ganglia and nerves, in the natural state, are about four times the size here represented.

PLATE III.

Exhibits a posterior and lateral view of the gravid uterus in the fourth month of pregnancy, of the vagina, rectum, and bladder, with their ganglia and nerves.

- A. The fundus and body of the uterus covered with peritoneum. B. The vagina. C. The bladder.
- D. The rectum. E, F. The ovaria.
- G. The great sympathetic nerve where it divides into the two hypogastric nerves and plexuses. The arteries and veins of the great sympathetic are all injected in the preparation from which the drawing has been made. A little above the bifurcation of the great sympathetic nerve there is a deposit of cineritious matter in its substance, and the nerve itself is enlarged as high as the kidneys.
- H. The right and left hypogastric nerves and plexuses. The artery of the right is injected, and accompanies the nerve to the great ganglion at the cervix, in which it terminates.
- I. The left hypogastric or great utero-cervical ganglion, with an artery passing into it near the centre.
- J. The third and other sacral nerves, sending numerous large branches into the posterior border of the ganglion, and the whole of its outer surface.
- K. The hemorrhoidal nerves accompanying the arteries to the rectum, and sending numerous branches to anastomose with nerves sent off from the posterior edge of the ganglion.
- L. Branches of nerves with ganglia sent off from the left hypogastric nerve, which pass down on the inside of the ureter to the trunks of the uterine artery and veins, and enter ganglia which surround these bloodvessels.
- M. The left ureter, with a nerve accompanying it, which passes into the vesical ganglion, situated on the anterior part of the ureter.
- N. Rings of nerve, surrounding the uterine bloodvessels.
- O. The middle vesical ganglion, into which large nerves enter, which are sent off from the anterior border of the left hypogastric ganglion, and pass on the outside of the ureter.
- P. Broad, flat ganglia, formed on the great plexus of nerves which covers the upper part of the vagina.
- Q. The orifices of the divided veins of the vagina, which are completely encircled with ganglionic plexuses of nerves.
- R. Filaments of vaginal nerves passing under the sphincter.
- S. Large nerves covering the posterior wall of the vagina, and anastomosing with the hemorrhoidal nerves.

PLATE IV.

Exhibits an anterior and lateral view of the gravid uterus in the fourth month, and of the vagina and bladder.

- A. The right hypogastric nerve. B. The sacral nerves.
- C. The right hypogastric ganglion.
- D. Nerves from the hypogastric nerve to the ganglia on the bloodvessels of the uterus.
- E. Ganglia surrounding the uterine artery and veins.
- F. Ganglionic plexus, under the peritoneum on the fore-part of the uterus.

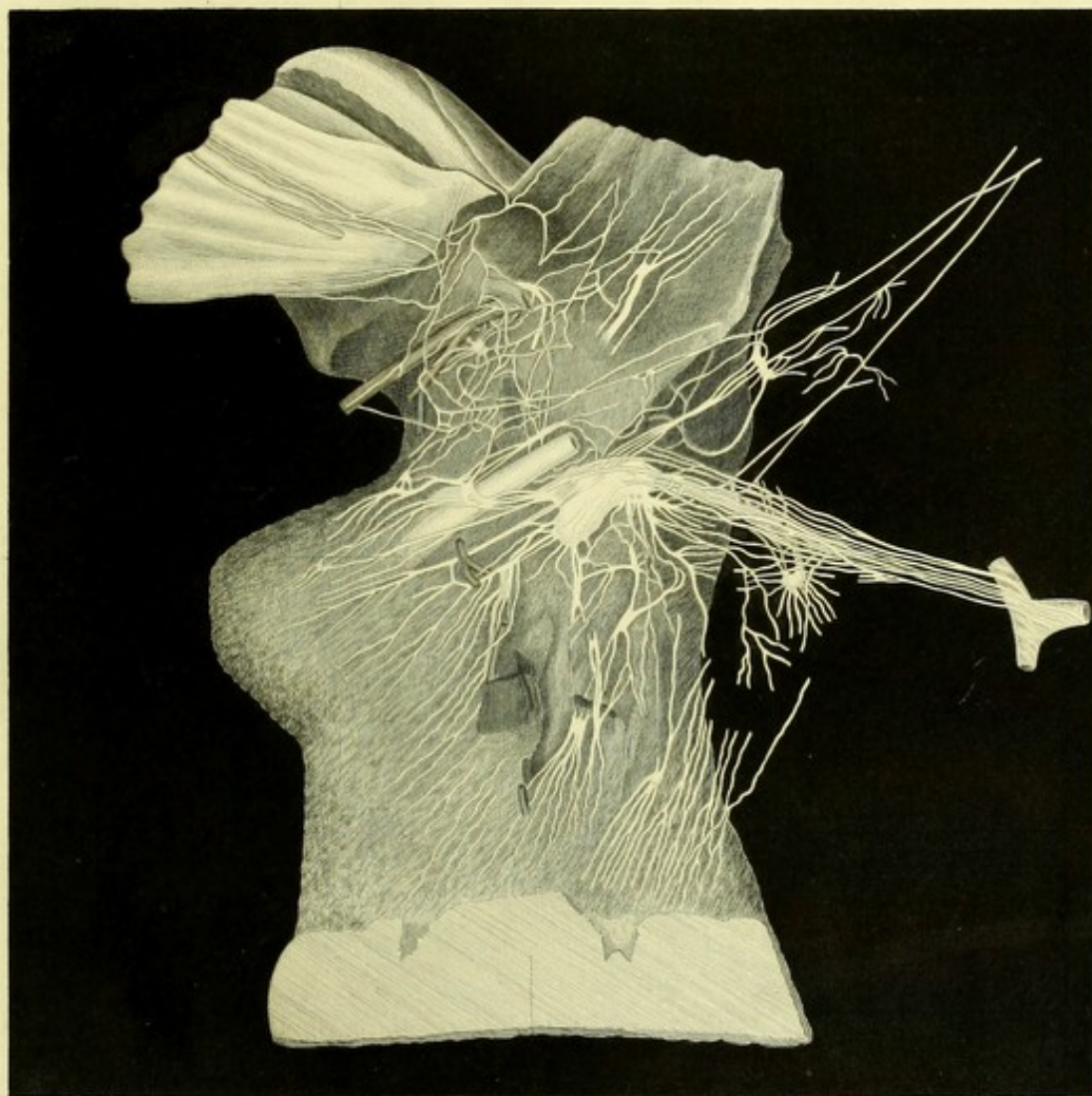
- G. Filaments from this plexus passing out with the round ligament. H. The round ligament.
- I. The right ureter and trunk of the vaginal and vesical veins surrounded with nerves.
- J. Ganglia and nerves of the vagina.
- K. Nerves passing between the vagina and rectum.
- L. Ganglia and nerves of the bladder.
- M. Vaginal nerves passing into the bladder around the ureter.
- N. Bloodvessels and nerves of upper part of the bladder.
- O. Plexus of nerves under the peritoneum on the left side of the uterus, the bloodvessels of which have not been injected.
- P. Filaments from this plexus passing out with the round ligaments.
- Q. The peritoneum of the anterior part of the body and cervix of the uterus reflected upwards, to expose the ganglionic plexuses situated below.

PLATE V.

Exhibits the ganglia and nerves on the posterior and left side of the gravid uterus at the end of the ninth month of pregnancy.

- A. The fundus and body of the uterus, having the peritoneum dissected off from the left side.
- B. The vagina covered with nerves proceeding from the inferior border of the left hypogastric ganglion.
- C. The rectum. D. The left ovary and Fallopian tube.
- E. The trunk of the left spermatic vein and artery surrounded by the left spermatic ganglion.
- F. The aorta divided a little above the origin of the right spermatic artery, and about three inches above its division into the two common iliac arteries.
- G. The vena cava.
- H. Trunk of the right spermatic vein entering the vena cava.
- I. Right ureter.
- K. The two cords of the great sympathetic nerve passing down along the front of the aorta.
- L. Trunk of the inferior mesenteric artery, passing off from the aorta, and covered with a great plexus of nerves sent off from the left and right cords of the great sympathetic.
- M. M. The two cords of the great sympathetic passing down below the bifurcation of the aorta to the point where they separate into the right and left hypogastric nerves.
- N. The right hypogastric nerve with its artery injected proceeding to the neck of the uterus, to terminate in the right hypogastric ganglion.
- O. The left hypogastric nerve where it is entering the left hypogastric ganglion, and giving off branches to the left subperitoneal ganglion.
- P. Hemorrhoidal nerves accompanying the hemorrhoidal artery and proceeding from the great plexus which surrounded the inferior mesenteric artery.
- Q. The sacral nerves entering the whole outer surface of the hypogastric ganglion.
- R. The left hypogastric ganglion with its arteries injected.
- S. The nerves of the vagina.
- T. Nerves with an injected artery proceeding from the upper part of the left hypogastric ganglion along the body of the uterus, and terminating in the left spermatic ganglion.
- U. Continuation of these nerves and the branches which they give off to the subperitoneal plexuses.
- V. The same nerves passing upward beneath the subperitoneal plexuses, and anastomosing freely with them.
- W. The left spermatic ganglion, in which the nerves and artery from the hypogastric ganglion, and the branches of the left subperitoneal plexuses terminate, and from which the nerves of the fundus uteri are supplied.
- X. The left subperitoneal plexuses covering the body of the uterus.
- Y. The left subperitoneal ganglion, with numerous branches of nerves extending between it and the left hypogastric nerve and ganglion.
- Z. The left common iliac artery cut across and turned aside, that the left hypogastric nerve and ganglion might be traced and exposed.

PLATE I.



E. West, del.

J. Baire, sc.

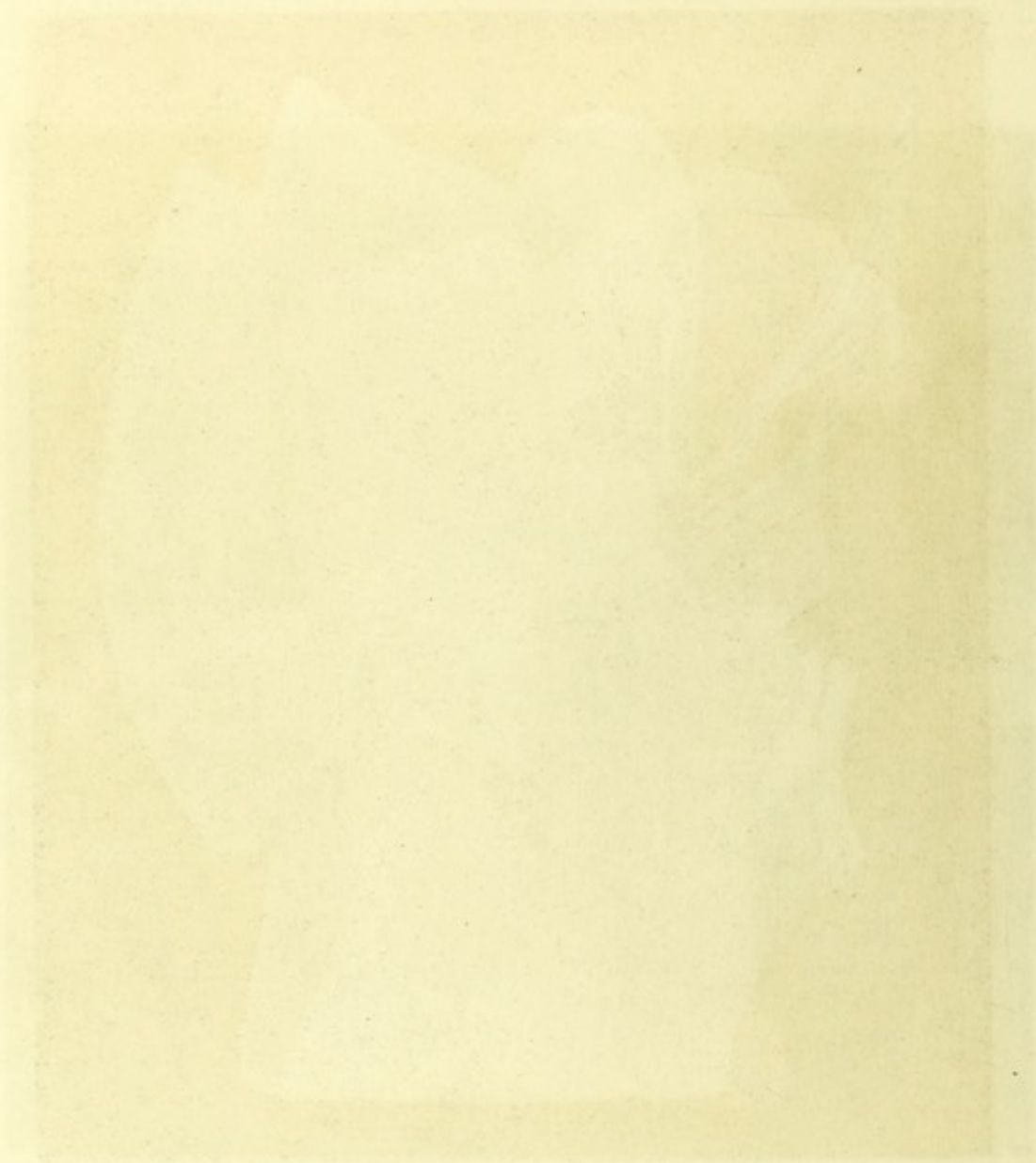
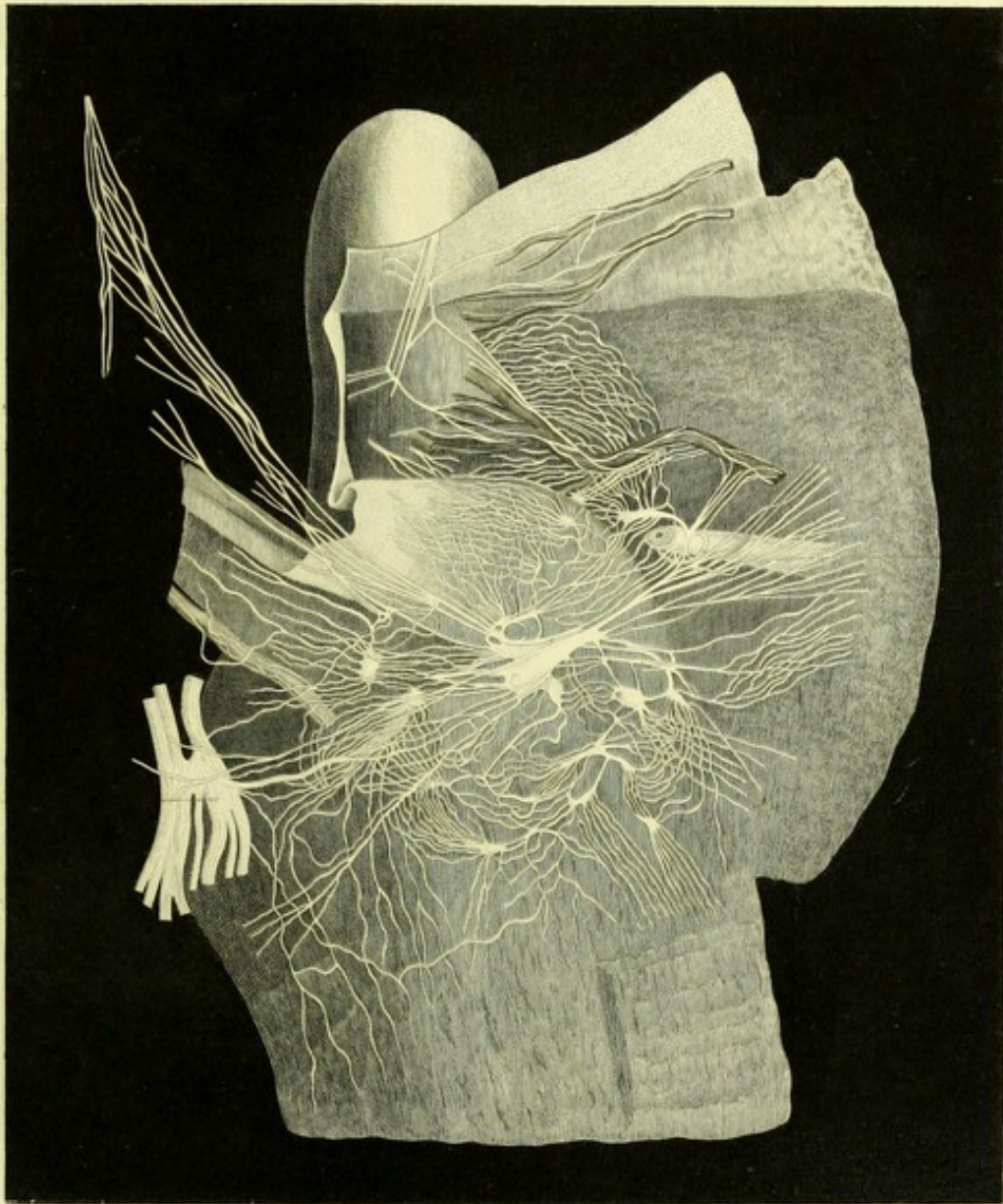
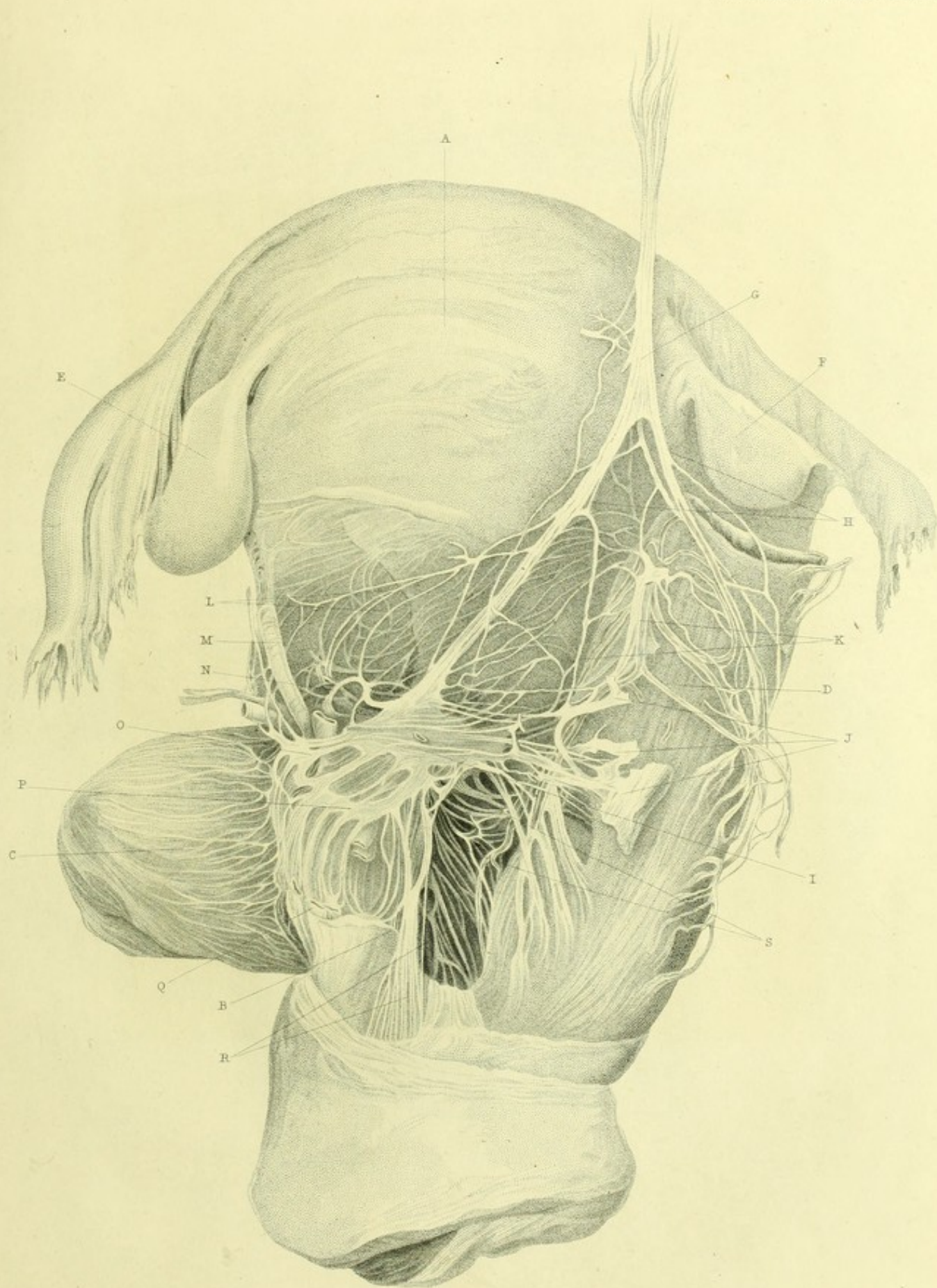


PLATE II.



E. West, del.

J. Basire, sc.



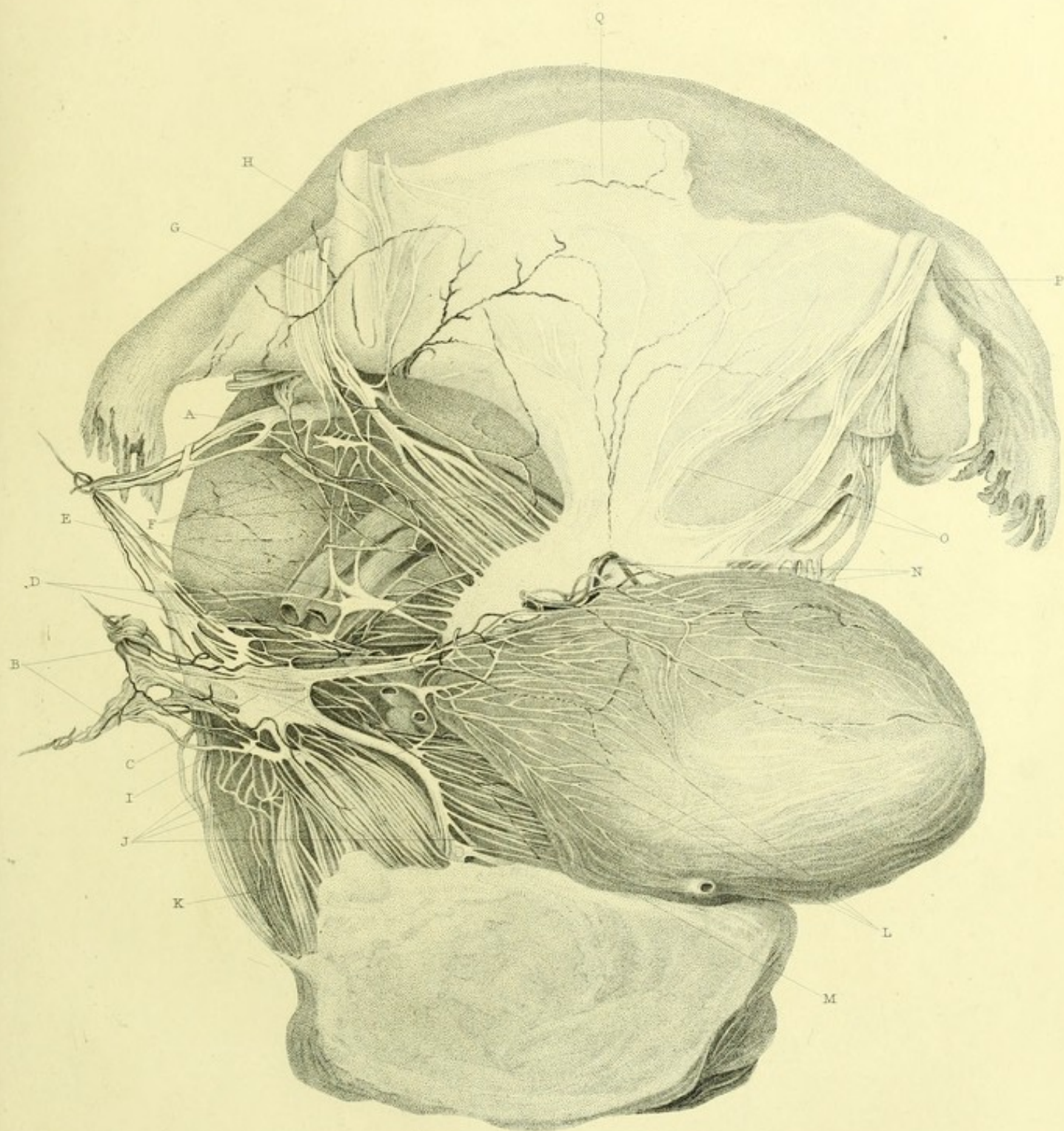


PLATE V.

Phil. Trans. MDCCXLII. Plate XIV. p. 178.

