proportion of it is small; on the other hand, for the function of this substance, by the conflict of two substances which have been prepared long before, a very slight excitement, chemical or other, suffices. These two laws lead necessarily to a third, namely, that phenomena of great intensity may be produced suddenly, when a chemical cause, even a very slight one, intervenes. This chemical cause, which though infinitely minute leads to sudden and powerful effects, is produced by the nervous system. It is probably in this way that is to be explained that wonderful phenomenon which has justly attracted the attention of all physiologists—the action of the nervous system on the secretions. One of the masters of physiology, the great Pflüger, whose recent death we now deplore, a long time ago sought to discover nerve endings penetrating into secreting cells. This is not necessary in order to understand the phenomena of glandular excitement. We need not suppose that the nervous protoplasm comes into direct contact with the glandular protoplasm. It is sufficient to admit that a most minute fermentative reaction is produced from the beginning of the nervous tube to its ending, running along from point to point like a train of gunpowder, with a rapidity of 30 metres a second, and that at the extremity there appears a minute quantity of substance which is capable of acting chemically upon the secreting cells. The imponderability and the instability of the chemical substances of our organs are sufficient to explain this action. And perhaps it is by an analogous mechanism that the nerves act upon the muscles and determine reaction. Who knows even if the complicated actions of the soul, reflex or voluntary, the feelings and the emotions, are not also chemical phenomena, as Lavoisier has already remarked in words that have become famous. But I do not wish to allow myself to be carried away by hypotheses; it is enough for me to have established that the irritability of our tissues is the necessary and inevitable consequence of the two fundamental laws of humoralism—imponderability and instability. You see, therefore, that there is no need to place in opposition to each other the humoral and the nervous theories, inasmuch as the irritability which rules the functions of the nervous system is in itself a humoral phenomenon. And, by a wonderful concatenation, the nervous system acts at every moment on the chemical constitution of our humours, just as the chemical constitution of our humours reacts each instant on the nervous system. But in the case of the nerves, as in the case of the humours, it is chemistry that governs all. The living being is a chemical mechanism, and perhaps it is nothing more.

In any case its completion is astounding, and we might well be afraid, if we had not before us the example of our glorious predecessors. With resources very inferior to ours, with imperfect instruments, obsessed by ridiculous theories, they finished by bringing to light some truths from the ocean of darkness in which they were sunk. It is true that they were not always modest, and they often believed themselves to have grasped the truth when they had only got hold of illusion and error. There also let their example serve us as a lesson. Let us be bold in hypothesis. One is never sufficiently so. But let us also be very cautious in affirmation. For that which constitutes a true man of science is that he joins to extreme boldness in hypothesis extreme caution in conclusion. Especially, do not allow your patience to tire. Nature is rebellious, and does not allow the first comer all at once to tear from her her secrets. One only succeeds in learning these terrible secrets in fragments, and at the cost of long and laborious efforts. There is no need for me, gentlemen, to recall this to you who have disinterestedly given yourselves to the study of the great problems of life. It is not, therefore, to you that I speak, but I will speak all the same, for I should wish that my feeble voice could be heard louder and further.

Science to-day cannot progress without great pecuniary sacrifice. Science is costly. Instruments and laboratories, staffs and material—the expense increases every day with the increase of the difficulties of research. It is therefore necessary that public authorities and public opinion, which is superior to governments, should at last understand that physiology must be supplied with necessary arms. But, alas! it

is other arms that are gathered on all sides. Never has the madness of militarism been so serious. All the energy that there is in peoples—energy, in men and energy in money—is devoted to the fostering of absurd hatred and fratricidal rivalries. War—the war which ruins and desolates mankind—war takes all. And science—beneficent and fertile science—science has only the remains. Incredible and lamentable error, which at all times weighs on human destiny, and to-day more heavily than ever.

Do you wish for a striking example? Here it is. An admirable discovery has just been made. Man has just succeeded in constructing flying machines and in supporting himself in the air, in traversing space as rapidly and easily as a bird. We have some right here, gentlemen, to be proud, since it is the physiologists who opened the way for the brothers Wright. I can speak of it here before you, Mr. President, who have made such beautiful investigations on the flight of birds. And why should I not recall the memory of a great physiologist, my master Marey, who, with his profound sagacity, foresaw the triumph of the airman? And why should I not say—not, I admit, without some pride—that with my ingenious friend Zatin, in 1892, we constructed and floated the first *aéroplane*. Aviation, therefore, has its starting point in physiology, and it is well to record the fact here in a gathering of physiologists.

Well, poor man is brutalized by his warlike fury to such a point, that the conquest of the air by science and human industry has at once suggested to him the triumphant idea that the *aéroplane* is a marvellous engine of war. He has set before himself the glorious task of transforming an instrument of pacification into a murderous machine, and, excited by foolish journals, public opinion has become more violently warlike.

In the face of this immense human folly we, my dear colleagues, have a great duty. That is, to seek to dissipate ignorance, for it is by ignorance that men are made as bellicose as savages.

Let us combat ignorance and aid the coming of the kingdom of science, which knows no frontiers. Science makes existence happier and less cruel. It is entitled to the respect of all, for it prepares a less barbarous world for the men of the future.

Honour, therefore, to our science! Honour to physiology, which strives for the mitigation of the misery, the error, and the suffering of mankind!

ABSENCE OF THE FALLOPIAN TUBES AND OF MENSTRUATION.

MONTHLY RECURRING ATTACKS OF PERITONITIS :
RELIEF FOLLOWING AN OPERATION JOINING
OVARIAN POUCHES WITH THE
UTERINE CAVITY.

By W. G. SPENCER, M.S.,

SURGEON TO THE WESTMINSTER HOSPITAL,

With a Note

By ALBAN DORAN, F.R.C.S.,

CONSULTING SURGEON TO THE SAMARITAN FREE HOSPITAL.

I AM much obliged to Mr. Alban Doran for his note on this case. He tells me that there is no similar case recorded in the *Transactions of the Obstetrical Society of London*; nor does there appear to be such a one included in the bibliography attached to Dr. J. W. Ballantyne's article in Allbutt and Eden's *System of Gynaecology*, second edition, 1906, p. 171; nor have I found any other reference.

History.

G. R., single, aged 28, a general servant, was sent into hospital in May, 1909, by Dr. Shillingford, of Peckham, complaining of attacks of pain in the right iliac region. The patient had never menstruated; she had never had a show of any kind. When aged about 18 she first felt sharp pains in the abdomen around the umbilicus, and such pains have recurred with fair regularity every month, usually lasting three or four days. Gradually the attacks of pain became more severe. They began by a strange feeling in the right iliac region; then, as the pain increased around the umbilicus, she felt faint, trembled, sweated, and had nausea. A very severe attack occurred in September, 1908, and another in the following November. Recently the umbilical pain had tended to spread

round to the back and downwards behind the left hip, the latter pain persisting between the attacks. The last occurrence was a week before admission. Her reason for going to Dr. Shillingford was that she was becoming unable to follow her occupation.

Examination after Admission.

She was a well-grown woman with normal breasts, external genitals, and hair. There was a well-defined normal hymen. Per rectum a normal movable uterus with cervix was felt. To the right side there was felt bimanually an oval swelling in the ileo-caecal region resting on the psoas muscle. It was thought to be an enlarged appendix, or an appendix adherent to an ovary, separated from the uterus by a normal broad ligament. On the left side there was a smaller swelling, which was taken to be a tender ovary, whilst the left broad ligament seemed free. No further abnormality was discovered.

Operation.

An incision was made through the right linea semilunaris, when the omentum was found adhering by its free margin over the fundus of the uterus and ovarian region (Fig. 1).

Fig. 1.—*l*, Liver. *ac*, Ascending colon. *tc*, Transverse colon. *dc*, Descending colon. *s*, Ovarian pouches. *om*, Omentum. *bl*, Bladder. *ut*, Uterus. *o*, Ovaries.

Having separated and reflected the omentum, a perfectly normal appendix was drawn out with the caecum, examined, and replaced.

Next the uterus was examined. The body was quite normal;

Fig. 2.—Lettering as Fig. 1. *r*, Rectum.

in the place of each cornu was a pea-like knob. There was no sign of the main portion of the Fallopian tube on either side, but the round ligament was well defined, and there was nothing

else abnormal about the inner part of the broad ligament. Each ovary was enclosed in a pouch formed by peritoneal adhesions; the opening of the pouch into the general peritoneal cavity was directed backwards; the peritoneal surface of the ovaries projected into the interior of the pouches (Fig. 2). This surface of the ovary appeared normal, and on pricking one of the follicles fluid spurted out; but I did not observe any sign of a corpus luteum of menstruation, nor any remains of blood clot or pigment whatever.

In the wall of the sac where it was continuous with the broad ligament there appeared to be traces of the fimbriae of the Fallopian tube. I then went on to search for the Fallopian tubes. A uterine sound was passed quite easily by Dr. Bourns, and to the normal distance. I then laid open the uterine cavity by cutting transversely upon the point of the sound (Fig. 3), and tried to pass a fine probe outwards through the cornua. But the lumen of the uterus did not extend into the pea-like knobs previously noted. On the left side the knob contained a small dermoid cyst enclosing sebaceous material but no hairs. On the right the knob was a mass of fibrous tissue. I next slit outwards the upper free edge of the broad ligaments, and split the layers without finding any trace of a Fallopian tube, except

Fig. 3.

what appeared to be the fimbriated extremity fused in the wall of the ovarian pouches.

Next I passed a drainage tube downwards from the uterine cavity through the cervix, and brought the orifices of the two ovarian pouches over the uterus and sutured them so as to establish a continuity with the uterine cavity (Fig. 4). Over

Fig. 4.

this I laid and stitched in position an omental graft, by cutting away the reflected omentum from the transverse colon, the raw surface so left being infolded. Thus, only serous surfaces

remained, and all opportunity for the further formation of peritoneal adhesions was avoided (Fig. 5).

Fig. 5.

The abdominal wound was then sewn up in stages. There was a little blood-stained uterine discharge, which soon ceased after the uterine tube had come away, on the fourth day, from the vagina.

The patient has returned frequently for examination. She is in very good health, has had no further attacks nor abdominal disturbance of any kind nor any noticeable vaginal discharge.

Conclusion.

As for the operative procedure, it was commenced with the object of relieving the patient by removing the appendix. On finding the appendix normal I went on to separate adhesions and search for the Fallopian tubes. The later stages of the operation had in view the prevention of the recurring attacks of peritonitis by shutting off ovarian follicles from rupturing into the peritoneal cavity, and was concluded by leaving no raw surfaces to re-form adhesions.

NOTE BY MR. ALBAN DORAN.

This case is of much importance, as systematic writers teach that in true arrested development of the Fallopian tubes the remainder of the united portion of Müller's ducts—that is to say, the uterus—is of necessity involved in the malformation. In Mr. Spencer's patient the uterus was well developed. Three features of special interest should be borne in mind. First, traces of the fimbriae of the Fallopian tube were detected on the wall of the ovarian pouch where it was continuous with the broad ligament. This is what the modern embryologists, Francis Balfour, Arthur Keith, and others, would expect. The arrest of the tubal portion of Müller's duct was complete, but these authorities have shown that the fimbriated extremity of the Fallopian tube is derived from the pronephros, and not from Müller's duct at all. This condition is seen in the adult shark. "Kobelt's tubes," on the outer extremity of the paroovarium, Wolffian body or mesonephron, are, we are taught, of pronephric origin also. Secondly, the knob which represented the Fallopian tube on the left side contained a small dermoid cyst. About ten cases of dermoid tumour of the Fallopian tube in our species have been reported, and Fromme and Heynemann review them in the new edition of Veit's *Handbuch der Gynäkologie*. Orthmann's monograph, *Ueber Embryoma tubae*, deserves special study. It is, indeed, strange that a disease so rare in the normal tube was found in this instance, where it was reduced almost to nullity. Lastly, let it be remembered, the round ligaments were well defined. This is the rule in malformations of Müller's ducts, especially in imperfect union of its lower portion with its fellow—that is to say, in bifid uterus. In the *JOURNAL*, vol. i, 1899, p. 1389, I reported "The Removal of a Fibroid from a Uterus Unicornis in a Parous Subject." A small fibromyoma had developed in the fibrous band which represented the suppressed uterine

cornu, yet the round ligament on the same side was very thick, far more developed than that connected with the other cornu, which had been gravid before, and was the seat of pregnancy after I removed the fibroid. The Fallopian tube was well developed on the side where the cornu was suppressed. Some authorities imply that precocious development of the round ligament is the cause of arrested fusion of Müller's ducts.

An Address

ENTITLED

THE QUICKENING SPIRIT.

BY

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In the slow and laborious process of the evolution of man towards his higher destiny certain moments appear as salient. Discoveries of natural laws, as that of gravitation, the utilization of the powers latent in matters of common occurrence such as steam, and the wonders of the microscope, are examples which readily suggest themselves. Even more notable for members of our profession are the discovery of general anaesthesia and the Listerian principles of surgical cleanliness. We are accustomed to regard such events more or less sudden because they have revolutionized hitherto accepted theories and practices. But we are certainly wrong in so doing. These epoch-making events represent in reality the fruition of a process whose germination, growth, and efflorescence have occupied long periods of time. For Nature does not work by hurricanes. We are conscious—it may be unpleasantly conscious—of the hurricane when it comes; but that is merely because we have been heedless, wilfully or ignorantly, of the premonitory symptoms of the cyclone, which the wise might, and ought perhaps, to have foreseen and forestalled.

In pondering over the manner in which I could most usefully employ the time so flatteringly placed at my disposal this evening, it occurred to me that, though very far from arrogating to myself a wisdom or a perspicacity above my fellows, inasmuch as I seem to discern in the trend of present-day medical thought a movement which is destined to occupy a great deal of time and interest in the immediate future, I might serve some useful purpose by endeavouring, however crudely, to focus attention on that movement, so that we may learn to utilize even what little is now known on the subject to the joint advantage of our patients and ourselves and the incidental undoing of the quack and the charlatan.

That mind exercises an influence over matter is a formula which most of us have lapsed since the days of our childhood. The formula represents a belief, held strongly perhaps, but essentially vaguely, even by those who have had a scientific training, and it has not hitherto assumed anything which could be described as a definite outline. Such an outline I believe it to be now in process of assuming, and it is the part of those who take the profession of medicine seriously to contribute something out of the vast store of material which lies daily to their hands towards the elucidation of some of the difficult but fascinating problems which await solution.

In the human body every motive force is provided with a corresponding controlling force, and it is important to realize that the motive force itself is always developed in advance of the corresponding controlling force. When a child is born it has the power of contracting its muscles and thus moving its limbs, but it is a long time before it can so co-ordinate these muscles as to walk or otherwise accurately accomplish any purposive movement. Similarly, the new-born child, though able to defaecate and micturate, is unable for many months to control these primal acts to the point of bringing itself within the accepted canons of cleanliness. So much is recognized, but it is not so well recognized that the same laws obtain in the region of what is called the mind. Here the motive force is represented by the emotions—a child is all emotion and instinct—and the control force is provided by reason and