OVARIAN PREGNANCY

(WITH NOTES OF A CASE).

BY

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THE once vexed question as to the possibility of primary ovarian gestation has now been settled. The conversion of two such sceptics as Mr. Bland-Sutton and Dr. Clarence Webster may be regarded as evidence that the reality of ovarian pregnancy has been proved beyond all doubt. We owe a deep debt of gratitude to Madame van Tussenbroek for her careful investigation of the first completely proven case. Its occurrence, however, is extremely rare, and every example deserves careful investigation and publication. As far as we have been able to determine, something like 10 authentic cases have been already recorded, the list of which is given in the first ten references at the end of this paper.

In spite of some opinions to the contrary, we feel confident that primary deposition and development of a fertilized ovum within ovarian tissue is an extremely rare occurrence. It has been frequently stated that many of the published cases of ovarian haematomata probably originated in gestation sacs; the statement has been based on the fact that microscopical examinations have not been made of such ovarian blood collections. Although entirely agreeing with the necessity of microscopy in all such conditions, we still adhere to our belief that ovarian gestation is very rare indeed. Many cases of ovarian haematomata have been subjected to microsections, and have been carefully examined. Quite recently Smallwood Savage published a series of 7 cases, and H. W. Wilson a series of 8 cases, in which, after full investigation, they did not discover a trace of evidence to show that they arose in gestation sacs.

The following case is one of ectopic gestation which, the authors feel satisfied, arose within the substance of the ovary. Although rupture of the sac with almost complete escape of all fetal elements had taken place at the time of operation—a fact which rendered complete proof a matter of some difficulty—we submit the case to the profession as one of primary ovarian gestation:

AUTHORS' CASE.

Clinical Report.—Mrs. P., age 35, was admitted into Queen's Hospital, Birmingham, under the care of one of us, on October 13th, 1905. She presented a letter from her medical attendant which stated that she was "suffering from subacute appen-

dicitis." She was a healthy-looking, well-preserved woman of medium height. She had been married eight years, had borne two healthy children (the youngest being 18 months old), and had experienced one miscarriage four years ago. Her two full-time pregnancies and confinements had been quite normal. Since her last pregnancy menstruation had been quite regular up to a few weeks of her present illness, her normal flow lasting four days. Her last regular menstruation occurred on August 21st, 1905. She missed her regular period in September, and thought that she was pregnant.

On October 2nd, when her period was fourteen days overdue and immediately after visiting the watercloset, she was taken with severe pain, "like strong labour pain," in the lower abdomen. She became "very faint," pale as death, cold and clammy. She was carried to bed and her doctor was immediately called in. Stimulants and sedatives were administered, and she soon became easier and better. Shortly afterwards she began to vomit, and this continued throughout the day. On the following day "her period came on." She lost a great deal with "shreds and little pieces." This continued for seven days. The pains recurred from time to time, and were most severe in right lower quadrant of the abdomen. She vomited after every meal up to the time of her admission.

The bowels acted regularly, and there was no trouble over micturition.

On admission she complained of severe abdominal pain, not confined to any particular area, but more in the lower half of the abdomen than elsewhere. She was vomiting biliary fluid and half-digested milk. She was markedly pallid, and looked extremely ill. The abdomen was rigid in its lower half, more especially on the right side. The rigid area was everywhere tender, but most so on the right. On palpation there was a sense of deep resistance in the right iliac region, but no definite tumour could be made out through the rigid abdominal wall. Per vaginam there was a hard doughy mass over the vaginal roof, very tender to pressure, especially marked on the right side. There was still a little brownish-red discharge from the

Fig. 1.—Fallopian tube and ovary, showing the oval cavity in posterior surface of the ovary. Gestation sac.

vagina. Temperature was 96°, pulse 92 per minute, and respirations 24 per minute. On the following day she was seen by one of us; the above physical signs were confirmed, and a diagnosis of ruptured tubal pregnancy was made.

She was removed at once to the theatre for operation. A 4-in. vertical incision was made to the right of the middle line through the rectus muscle. On opening the peritoneal cavity, about 2 pints of porter-like fluid escaped, and still more was mopped up from the pelvis. A mass of firm clot as large as a fist was removed from the deepest part of the pelvic cavity, being bounded by firmer fibrinous clot, which formed the walls of an almost perfect cavity. The uterus was larger than normal, but was otherwise healthy. The right Fallopian tube was normal from end to end; fimbriae free and unattached. The right ovary was enlarged, and was incorporated with, and formed part of, the walls of the sac in which the above-mentioned blood clot lay. A ragged opening was found in its posterior surface towards the pelvic cavity, and it was from this surface that the bleeding had evidently occurred. The ovary and tube were therefore tied off with silk close to the uterus and removed. The left ovary and tube were quite normal; they were brought up to the surface and submitted to the inspection of several medical men who were present. They were not removed. The pelvis was cleaned up with dry mops and the wound was closed. The patient made an easy

recovery. On October 21st an offensive vaginal discharge commenced, which lasted three days, and then entirely ceased. On November 4th she left hospital quite well, and has remained so up to date.

Macroscopical Appearances.

The specimens were immediately secured by one of us for full investigation, and the following description was made within an hour of their removal. The parts to be described consist of an oval portion of firm blood clot and a Fallopian tube with the ovary attached.

Blood Clot.—The blood clot removed from the pelvic cavity was roughly oval in shape, and tolerably firm in consistence. It had the following measurements: 6.2 cm. by 3.5 cm. by 3.5 cm. Portions of its surface are covered by a thin fibrinous smooth covering, whilst other surfaces represent broken sections of ordinary blood clot. Sections of the blood clot show that it consists almost entirely of old coagulated blood interspersed with fragments of white fibrous-like tissue. There is no evidence of a fetus, or of any well-formed membrane to the naked eye.

The Fallopian Tube. from cut surface to fimbriated extremity, measures 4.75 cm. in length, and has a calibre at its widest part of not more than 0.7 cm. The surface of the tube is everywhere smooth and covered by smooth peritoneal lining. There is no evidence of a rupture at any point. The inner four-fifths of the tube is more or less straight and uniform in calibre. Close to the fimbriated extremity is an elbow-shaped bend well seen in the photograph; the calibre of the tube, however, is not greater than normal at this point. This elbow appears to have been caused by mechanical action due to a traction upon the fimbriated extremity, probably as a result of old inflammatory reaction. The fimbriae, though perfectly free, are dwarfed and stunted. The ostium abdominale, though readily observable, is not more patent than usual. Attached to the lower pole of the fimbriated extremity is a small hydatid of Morgagni.

The Ovary.—The ovary is attached by a well-marked mesentery to the outer portion of the Fallopian tube. Its measurements are as follows: Length, from apex to base, 4 cm.; breadth, hilum to opposite border, 4 cm.; thickness, between two surfaces, 1.5 cm. The arrangement of the relationships of the ovary will follow the lines of His and Waldeyer's description of the normal ovary. What His and Waldeyer would describe as the inner surface of the ovary has, by an inward hinge-like bend of the mesovarium, come to look anteriorly, and is closely applied to the posterior surface of the broad ligament. What these observers describe as the outer surface has come to look backwards. Whether this was the normal relation of the right ovary, or the result of the pathological condition present, we cannot say. Our description will be intelligible when we say that the outer surface of Waldeyer corresponds to the posterior surface, and the inner surface of Waldeyer to the anterior surface of this specimen. The anterior surface of the ovary everywhere presented a smooth, glistening covering, the upper hemisphere being white and corrugated like a normal ovary. The lower hemisphere was plum-coloured, but smooth and corrugated. At the most dependent part of this surface there were a few tiny blood clots loosely adherent. The posterior surface presents features of special interest, and requires a more detailed description. This surface is entirely devoid of any smooth covering. It is of a dark-red colour and has blood clot attached to its circum-

ferential border. It is roughly divided by a deep transverse cleft into an upper and a lower half. This cleft is oval in shape, and gradually shelves from its depth towards the upper pole of the ovary above and towards the lower pole below. The extreme margins of the cleft are raised above the level of the surface of the ovary proper to a height of 0.8 cm.; this is well seen in Fig. 2, which shows a transverse section of the cleft. The greatest length of this oval cavity is 3.23 cm., the breadth at its widest point is 2.5 cm., and its greatest depth is 2 cm. The cleft in the ovary is so deep into the ovarian substance that the tissue separating the depth of the cleft from the anterior surface of the ovary is only 0.76 cm. in thickness. It is quite evident that the cavity in the posterior surface of the ovary has been a segment of a much larger cavity which was probably originally situated within the ovary, and which had gradually expanded until the posterior surface had given way and allowed the contents to escape into the peritoneal cavity. The cavity still left in the ovary when examined was lined with a plum-coloured glistening covering, thrown up into a complicated series of folds and depressions well seen in Fig. 1. There was little or no dark blood clot adherent to the deeper surface of the cavity. Around the circumferential margin, however, were fragments of clot which

could not be detached. Bulging from the lower half of the ovary into the cavity is a rounded body about the size of a filbert nut. This proved, when the ovary was sectioned, to be a large corpus luteum. This body appeared to be quite distinct from the cavity, although it had to some extent become undermined by the deepest part of the cleft (see Fig. 2).

Microscopical Appearances.

The Blood Clot from the Pouch of Douglas.—This was mainly composed of non-nucleated blood cells crowded with leucocytes. There are extensive areas of almost pure leucocytes, especially at the margin of the clot, and large tracts of fibrin crowded with leucocytes. Scattered irregularly throughout the clot are clusters of chorionic villi in various degrees of preservation (see Fig. 3). The connective tissue matrix of the villi is generally oedematous, and there is no evidence of vessel formation in them. Many of them are covered with two

or more layers of cells, which represent Langhans's cells and occasional syncytial cells. Many of the syncytial cells, however, are scattered loosely in the meshes of the clot. Other villi are covered with one layer of cells with well-marked nuclei representing Langhans's cells only. Others, again, show this layer as a homogeneous covering with faintly-stained nuclei, and others, again, are covered with a swollen homogeneous covering staining brown with van Giessen and red with eosine, without any nuclei being visible. Many of the villi are surrounded by hosts of leucocytes.

There is no trace of a fetus, no representative of amnion or decidua anywhere visible in the clot.

The Fallopian Tube.—Sections were made from several parts of the ampulla and the fimbriated extremity. The lumen shows no dilatation anywhere (see Fig. 4). The muscular tissue of the tube shows neither hypertrophy nor atrophy in any of the sections. The mucous coat is covered by a single layer of columnar, ciliated epithelium exactly resembling that of the healthy tube. There is no proliferation of the epithelium, and no decidua cells seen in any of the sections. A mild degree of leucocytic infiltration exists, especially in the subperitoneal and perivascular tissues. The vascularity of the tube is slightly increased, especially in the

Fig. 2.—Vertical section through the ovary, showing the gestation sac and corpus luteum below it.

subperitoneal zone; and is most marked in the sections taken from the fimbriated extremity. The vessels show a mild degree of endothelial proliferation: this is particularly marked in the smaller vessels.

The Ovary.—Serial sections were made of almost the entire ovary. The ovarian stroma in the region of the hilum consists of dense fibrous tissue packed everywhere with enormously hypertrophied blood vessels with dense hyaline walls. The ovarian stroma generally is more fibrotic in type than is the

The belt of ovarian stroma surrounding the gestation sac has undergone a peculiar transformation. Here the stroma is more reticular and looser in texture. It is arranged in a concentric manner, so that the long axis of the spindle cells and the delicate reticular tissue lie parallel to the surface of the cavity. The stroma is intensely vascular and shows many points of blood extravasation. The blood vessels are enormously dilated, thin-walled, and they present more the appearances of blood sinuses (see Photomicrograph 5). They

Fig. 3.—Showing numerous chorionic villi in blood-clot from pouch of Douglas.

normal ovary, suggesting that it has been the seat of a mild chronic inflammation. The stroma is composed chiefly of spindle and polyhedral cells whose nuclei stained very deeply. In certain parts there are large swollen cells somewhat resembling decidual cells. There appear, however, to be all gradations between the ordinary stroma spindle cell and these large rounded cells.

There are very few Graafian follicles to be found anywhere,

Fig. 4.—Section across the Fallopian tube near the fimbriated extremity.

and these are immature, frequently compressed, and exhibit degenerative changes. The cells of the stratum granulosum usually show no regular arrangement, and are frequently crowded together into one group towards one side of the follicle. In almost all there is a catarrhal folliculitis.

There is only one corpus luteum seen in the entire ovary, and this will be described later. Several small corpora albicans are scattered irregularly throughout the ovarian stroma.

Fig. 5.—Showing the vascular sinuses in the wall of gestation sac, with corpus luteum below.

possess little or no muscular tissue, but are lined with a well-marked endothelial covering showing in many a distinct proliferation. Many of the blood sinuses open directly into the gestation sac. The stroma cells of this portion of the ovary are irregularly scattered amongst the reticular tissue and blood sinuses. They are chiefly spindle or swollen, rounded cells which have a large, deeply-staining nucleus and faintly-staining protoplasm. There are no Graafian follicles to be

Fig. 6.—Showing chorionic villi embedded in fibrin within the gestation cavity.

found in the narrow belt of ovarian tissue surrounding the sac.

The gestation cavity itself is lined in part by a ragged surface, consisting of open-mouthed sinuses and fine reticular tissue. Large areas, however, are covered with a clear, fibrinous-like deposit closely adherent to the surface of the sac. At several points well-marked chorionic villi are embedded within this fibrinous deposit (see Photomicrograph 6). At no point, however, do chorionic villi penetrate

to the ovarian stroma. Although fibrin and blood clot are adherent to the surface of the ovary at other points than within the sac, chorionic villi are only found within the actual gestation cavity.

Bulging into the gestation sac from the lower half of the ovary is a large corpus luteum composed of large lutein cells, and showing a stellar, fibrous centre, which shows moderately advanced vascularization. The corpus luteum is perfectly intact, and is separated from the gestation sac everywhere by

Fig. 7.—Showing corpus luteum, its stage of vascularization, and its proximity to the gestation sac.

a thin layer of loose highly vascular ovarian stroma (see Photomicrographs 6 and 7). The gestation sac is situated on the upper surface of the corpus luteum, and its deepest part has largely undermined the corpus and lies behind it. It is in that portion of the gestation cavity adjoining the corpus luteum and close to the surface of the ovary that chorionic villi are most abundant. The villi are embedded in fibrinous deposit, and are separated from lutein cells by fibrin and a thin layer of ovarian stroma. There are no lutein cells

Fig. 8.—Showing proliferation of the endothelium of a blood vessel.

visible anywhere except in the intact corpus luteum just described. There is no trace of decidual cells in any part of the gestation cavity and no representative of the amnion.

REMARKS.

The rupture of this sac, with almost complete evacuation of fetal elements placed some difficulty in the way of determining its real nature. The history of the case with its amenorrhoea, the passage of blood and shreds per

vaginam, the recurrent abdominal pain, together with the physical signs, are typical of ectopic gestation. This was the diagnosis made before laparotomy was performed. The operation revealed severe intraperitoneal haemorrhage and a pelvic haematocoele incorporated with the right ovary. The right appendages were removed. The left appendages were carefully inspected and were universally admitted to be healthy. The cavity in the right ovary was seen before the appendages were removed to be adjacent to the pelvic haematocoele, and no doubt formed part of its wall.

In reviewing the clinical facts revealed by operation, we naturally felt that there were several pathological conditions which might possibly explain them. Of these, the following occurred to us: (1) A ruptured ovarian haematoma; (2) uterine abortion, complicated by a ruptured ovarian haematoma, or cyst, or a traumatic tear of the ovary; (3) a tubal abortion with either a ruptured ovarian haematoma or cyst, or accidental tearing of the ovary at the operation; and (4) a ruptured primary ovarian gestation.

In order to arrive at a satisfactory conclusion it was necessary to explain three things which might or might not be due to the same cause, namely, (1) the point from which the profuse peritoneal haemorrhage arose; (2) the pathological process producing that haemorrhage; and (3) the nature of the cavity in the right ovary.

During the course of a careful microscopical examination it soon became clear that the facts could only be explained in one way. The finding of chorionic villi in the pelvic haematocoele practically dismissed causes Nos. 1 and 2, and, at the same time, determined that the case was, in whole or in part, one of ectopic gestation.

If tubal in origin, it must have arisen in either the left or the right side, and the cavity in the ovary still remained to be explained. We are satisfied that the right-sided position of the haematocoele and the generally-admitted healthiness of the left appendages readily dismiss the possibility of it being a left-sided tubal pregnancy. It is evident that it did not arise as a right tubal pregnancy, because of its healthy macroscopic appearances, and because of the entire absence of any microscopic reaction—vascular, chorionic, or otherwise—in it suggestive of a tubal gestation. There was not the slightest reaction of the tubal mucosa in any of the many sections made comparable to a decidua. We are quite aware, however, that salpingeal decidual formation is very fragmentary in true tubal pregnancy. It was now possible to go a step further in the diagnosis and exclude cause No. 3.

The final stage of the investigation was the examination of the ovary, and especially of the cavity situated on its posterior surface. The naked-eye appearance of the cavity, with its raised edges, its shelving base, its deep plum colour, and the microscopic arrangement of the connective tissue stroma lining it, together with the fact that the cavity was seen before removing the appendages, entirely dismissed the possibility of this cleft being caused by operative violence. We found nothing in the cavity to suggest that it arose either as a corpus luteum or Graafian follicle cyst. Happily for us, the sac had not entirely emptied itself, and we were able to find, by careful serial sections, a few chorionic villi embedded in fibrin lining the cavity. We then felt justified in arriving at the conclusion that this was a case of primary implantation of a fertilized ovum within the substance of the ovary, and that by gradual distension and thinning of the part nearest to the surface rupture of the sac followed with expulsion of the mole into the pouch of Douglas. The macroscopical evidence in support of this view is found in certain characters of the space—namely, its raised edges, its shelving base, its depth within the ovary, its deep plum colour, and all the negative changes in the tubes. The microscopical evidences in favour are to be found in the numerous chorionic villi found in the mole which was seen to be incorporated with the cavity, the presence of the villi in the fibrin lining the sac, the intense vascularity of the adjoining ovarian stroma suggestive of an intervillous circulation, and all negative evidence of pregnancy in the right tube.

It is probable that on October 2nd, when the sudden abdominal pain with collapse occurred, the gestation sac then ruptured and severe abdominal haemorrhage took place. In the intervening twelve days, between this onset and the operation on October 14th, recurrent

smaller haemorrhages supervened, with almost complete stripping of the chorion and fibrinous lining of the sac.

To return to the three questions which we set ourselves to answer at the beginning of the investigation, we can confidently assert, first, that the seat of the haemorrhage was the open sinuses of the ovarian cleft; secondly, that the pathological process causing that haemorrhage was the phagocytic action of the fetal trophoblast, with subsequent stripping of the chorion and fibrin from the opened vessels in the ovarian gestation stroma; and thirdly, that, as must necessarily follow, the cleft in the ovary is a gestation sac at one time situated entirely within its substance.

One of the most important points brought out in this case is the relation of the corpus luteum to the gestation sac. We think that there can be little doubt that the large corpus luteum, which is in a fairly advanced state of vascularization, represents the Graafian follicle from which the pregnancy arose. Yet it remains quite intact and separated from the gestation sac everywhere by a thin layer of ovarian tissue.

In reviewing those previously recorded unruptured cases, in which careful microscopic examinations were made, we find that in three of them—namely, Leon and Holleman's, Freund and Thome's, and Webster's—no lutein cells were found in the gestation sac; whereas in four of them—namely, van Tussenbroek's, Thompson's, Kelly and McIlroy's, and Anning and Littlewood's—lutein cells were present in the wall of the sac. If we include our own case, one-half of the gestation sacs contained lutein cells and the other half did not.

As far as we can find, this is the only specimen of ovarian gestation which shows a corpus luteum corresponding in age to the pregnancy and quite distinct from the gestation space. Therefore, it probably has a very direct bearing upon the somewhat doubtful question as to where fertilization takes place in ovarian pregnancy, and what is the exact site at which a fertilized ovum settles and develops in the ovary.

Although penetration of Graafian follicles by spermatozoa has been observed in rabbits, so far as we know it has never been definitely proved in the human subject. We would hesitate to believe that spermatozoa can penetrate into an unruptured follicle until absolute proof is forthcoming. It is quite possible, however, for the male element to project itself into a ruptured follicle and fertilize the ovum *in situ* previous to its extrusion. It is still more easy for fertilization to take place when the ovum has been expelled on to the surface of the ovary.

In those cases where lutein cells are found in the gestation sac the ovum must either have been fertilized in the follicle, or, if fertilized at the mouth of the follicle, it must have returned by phagocytic action or otherwise into the follicle where further development has taken place.

In those cases where no lutein cells are found in the sac the presumption must be that the lutein cells have either been rapidly absorbed by the trophoblast, or, after fertilization, the phagocytic ovum has burrowed into quite another part of the ovary.

The phagocytic power of the fertilized ovum is now well authenticated, but we do not know how early after fertilization this phagocytic property can assert itself. Hence, the site of final lodgement and development of the ovum in an ovarian gestation does not necessarily correspond to the point where fertilization took place. In the case just recorded the probable sequence of events would appear to be as follows: The act of fertilization occurred either whilst the ovum was inside the open-mouthed ruptured follicle, or after that ovum had been expelled on to the surface of the ovary. In either case, the ovum came outside upon the surface and did not migrate directly upwards into a higher part of the ovarian stroma. We infer this because, although serial sections were made, there is not the slightest solution of continuity in the thin layer of ovarian stroma which separates the corpus luteum from the space in which the gestation occurred. The ovum was probably expelled on to the surface fertilized or unfertilized, and possibly owing to superficial adhesions, or by settling into a crypt or depression on the surface of the ovary, it then, by virtue of its phagocytic action, sank deeper into the ovarian stroma at a higher level than the corpus luteum. Whatever the mechanism may have been, the fact seems established that ovarian gestation is not necessarily always follicular.

There was nothing discovered in this specimen to represent the fetus. This is not surprising, seeing that the ovum in ectopic gestation very readily perishes, and in this case it might have been lost or overlooked in the peritoneal haemorrhage. In many of the unruptured cases no ovum was found, and in those where it was discovered it was frequently undergoing decomposition.

For a similar reason, perhaps, we could find no microscopical remains of an amnion. Even in the unruptured cases of Thompson and of Leon and Holleman no true amnion was discovered.

We could find nothing comparable to a decidua in the sac. This was also the case in the six specimens investigated by van Tussenbroek, Thompson, Leon and Holleman, Webster, Freund and Thome, and by Kelly and McIlroy.

We discovered nothing in the ovarian stroma which we could regard as a decidual reaction such as Webster found in his case, and which he claims to represent Müllerian segregations within the ovary. We found large cells, oval or irregularly stellar in shape, with a well-stained nucleus and feebly-stained protoplasm, but they appeared to be swollen connective tissue cells, and there seemed to be all gradations between these large cells and the normal oval or spindle ovarian stroma cells. There were also groups of cells somewhat resembling decidual cells, which we regarded as cells of the membrana granulosa lying within flattened degenerate and immature Graafian follicles.

It seems to us that Webster's assumption that primary gestation can only occur where Müllerian tissue exists, and that these groups of cells which he and others have found in the ovarian stroma are decidual in nature and Müllerian in origin, is going further than the facts warrant. We know now that cells resembling decidual cells have been found during uterine pregnancy, not only under the uterine serosa, the subserosa of the pouch of Douglas, the rectum, the Fallopian tubes, and ovaries, but also by Penkert, Schmorl, and Prochownik in the omentum, by Hirschberg on the vermiform appendix, by Amos, Fisch, and Schmorl under the parietal peritoneum, and by Taussig on the small intestine which was adherent to a pregnant uterus.

Whether Webster is prepared to claim that all such decidual reaction represents misplaced Müllerian tissue we do not know. The assumption certainly is largely discredited in view of this widespread distribution. The onus of the proof that these cells are Müllerian rests with him, and not with the sceptics of his theory as Webster seems to suggest. The explanation of this widespread decidual reaction made by Taussig in his able paper on Ectopic Decidual Formation seems to us a much more feasible one. He thinks that, seeing that this reaction occurs only in regions more or less closely approximated to the uterus and tubes, and that the presence of adhesions between other organs and the uterus and tubes in a pregnant state favours decidual formation in the former, it is a transformation of the connective tissue cells in these parts induced by the pregnant state. In the ovary the decidual cells are derived from the stroma cells, in the omentum from the fat cells, and in the subserosa from the connective tissue cells of that structure. What this transforming influence is due to, whether to nerve influence or to the absorption of some internal secretion from the uterus or ovaries, we cannot say.

Finally, we would like to draw attention to the attempt made by the ovarian stroma immediately adjacent to the gestation sac to cope with the demand for nourishment on the part of the ovum. We found, as did most of the other observers, that the chorionic villi found within the space did not reach the ovarian stroma, but were embedded in fibrinous clot lining that space. The vessels of the stroma, however, had undergone a marked dilatation suggestive of intervillous spaces, and many of these spaces exhibited a degree of endothelial proliferation comparable to the trophospongia of Hubrecht, and which he regards as characteristic of pregnancy.

In conclusion, we desire to thank Professor Leith for his kindness in allowing us the use of his photomicrographic apparatus in the preparation of the photographs which illustrate this paper.

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MEMORANDA: MEDICAL, SURGICAL, OBSTETRICAL.

THE TREATMENT OF INFANTILE DIARRHOEA.

As during the extreme heat infantile diarrhoea appears to be exceptionally prevalent, I hasten to invite attention to a method of treatment which appears to have acted like a charm in the few cases in which I have tried it.

Immediately the case is seen a suitable diet is prescribed, and the good old-fashioned half-teaspoonful of castor oil is given to sweep away any fermenting particles of food. As soon as this has acted, 3ss to 3j, according to the age of the patient, of infusion of quassia is given as an enema, a small glass syringe being used for this purpose. If necessary, the injection may be repeated two or three times at intervals of three or four hours. In the few cases in which I have had an opportunity of trying this treatment the diarrhoea ceased after the first injection. This may, of course, have been a mere coincidence. On the other hand, it may have been directly due to the action of the quassia; and I am anxious that others should give the treatment a trial and record the results. If it is desired to give a more astringent preparation, decoction of haematoxylon may be substituted for infusion of quassia.

The use of quassia or haematoxylon in this way was suggested by the failure of other methods of treatment, and by a recollection of the great benefit occasionally obtained from enemata of nitrate of silver in the acute diarrhoea and dysentery of adults in the tropics.

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TRANSPPOSITION OF CAECUM AND APPENDIX.

A FEW days since I operated upon a male child, aged 15 months, for a large inguinal hernia on the left side. The sac contained the caecum and appendix. The appendix was about 3 in. in length and perfectly healthy. The caecum was completely covered by peritoneum and freely movable.

There was no evidence of transposition of any of the other viscera. It is well known that the caecum may be found upon the left side, but its presence in the left inguinal hernia is sufficiently unusual to deserve record.

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SERUM IN MALTA FEVER.

As we are yet without a specific for Malta fever, and, indeed, without means of influencing the course of the disease, the following note may be of use:

A European patient was sent up here early in the summer for change, having had Malta fever for over three months. He had marked anaemia, had an attack of dysentery, some dropsy, and transient purpura. On the 138th day of the fever he was given about 3vj of horse serum which had been heated to 55° C., as practised by Petit for the encouragement of phagocytosis in bacterial invasions (see Metchnikoff's Harben Lecture in June, 1906, number of *Journal of Preventive Medicine*).

For the previous three weeks the patient's temperature came down in the mornings for a short period to 99°, and nearly every evening was up to 103°. On the 139th day his temperature went to 100° for a short time, and on the 140th day it did not rise above normal all day. He had no fever afterwards, but, most unfortunately, congestion of the left lung appeared on the 143rd day and carried him off in three days. Of course, this sudden cessation of the fever may have been only a coincidence, but in a disease like this every chance is worth seizing. I wish that I had known of the treatment earlier in the case.

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REVIEWS.

A MEDICAL TRAVELLER.

UNDER the title of *Around the World via India*,¹ Dr. NICHOLAS SENN has republished a series of letters sent by him to the *Journal of the American Medical Association* whilst on a tour of the Pacific Islands, Australasia, and India during the summer of 1904. The book is most interestingly written and full of instruction. In the opening chapter the author insists on the great usefulness of travel for the purposes of post-graduate study. By touring about the world, and observing medical and surgical work in all kinds of places and under every possible condition of climate, race, and environment, a practitioner may gain more useful knowledge than by reading any amount of textbooks. Dr. Senn deals systematically with each country he visited. After giving a short description of the country and its inhabitants, he treats of the medical aspect of each individual city or town, the status of the profession therein, the number of hospitals, their fitness for the work they are called upon to perform, and the manner in which that work is performed. He touched first at the Hawaiian Islands, and his description of the leper settlement on the island of Molokai throws a new light on the lives of these poor outcasts from society. He pays a touching tribute to the splendid work done there by Father Damien and his courageous assistant, Brother Dutton, who is still toiling in the same vineyard "free from the loathsome disease after an uninterrupted service of twenty-three years." Dr. Senn urges the United States Government to convert the whole island into a colony for lepers from all parts of the world, and to found a laboratory there having a "recognized scientist at its head," with the object of discovering a remedy for this awful disease. Since Dr. Senn's visit, Dr. Walter R. Brinckerhoff, of the Pathological Department of Harvard Medical School, has been appointed Director of this leprosy station; we may, therefore, look forward to some real advances in our knowledge of this hitherto inscrutable disease. The author proceeds to detail the diseases most prevalent in the island of Honolulu, the capital of Hawaii. The hygiene and sanitation are supervised by a Board of Health, the country being divided into districts with a medical officer over each. He was very favourably impressed by the work done by the practitioners in these islands; he gives a useful hint to young doctors on the outlook for a place of settlement by adding that the number of medical men is ample for their requirements. The author's next place of call was Samoa. His account of the people, their liability to certain forms of disease—especially to elephantiasis in the male—make very interesting reading.

Auckland, New Zealand, was the next port of call. Dr. Senn is well satisfied with the hospital, and gives an account of some interesting cases he saw in its wards. He comments on the fact that of forty medical men in practice in Auckland, thirty-nine are general practitioners, there being only one specialist, and he takes the eye and ear for his province. We learn that the *BRITISH MEDICAL JOURNAL* is the chief source of information in medical subjects for the medical men of New Zealand.

From New Zealand Dr. Senn crossed over to Sydney, which struck him very favourably, whilst the country round "surpassed all my expectations." He gives a very good account of the various hospitals in the place, and reproduces some figures from the operating records, which show that the surgery of Sydney compares well with that of America and Europe. He concludes his account of Sydney with the following interesting remarks:

The doctor's social standing in Australia is much superior to our own. His financial possibilities compare well with that of any other country. A fair average fee for a capital operation is 250 dollars; a maximum 500 dollars; consultation from 10 to 25 dollars; and visits average 2.50 dollars; obstetric fee from 10 dollars to 25 dollars. There are several men in Sydney whose annual income amounts to 30,000 dollars. The country practitioners, of course, do not fare so well, but their expenses are so much less that at the end of the year their bank account makes a fair showing. The relations between the members of the medical profession are cordial, and the commercial element is not nearly as rampant as with us. The requirements for entrance are not at all stringent.

¹ *Around the World via India*. By Dr. Nicholas Senn. Chicago: American Medical Association Press. 1905.