of the median line. In this performance he has "crowded" most of the abdominal contents beneath the diaphragm. In F, on the other hand, he has produced a "phantom tumour" by driving coils of intestine within the weird and peculiar grasp of the rectus and oblique muscles. The "growth" is rounded, and dull on percussion, and, as he remarks, looks as if it wanted an exploratory puncture. Certainly it is most suggestive, and well worth an inspection.

In conclusion, I would tender my best thanks to Mr. Jerrard of 107, Regent Street, for the time and skill which he placed at my disposal in the preparation of the excellent photographs from which the woodcuts have been prepared by which these notes are illustrated.

TRAUMATIC MALIGNANCY.

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THE communications of Mr. Barwell and Mr. Butlin, in recent numbers of the JOURNAL, are of great interest and value in again directing attention to the connection occasionally existing between injuries and malignant growths. All who have had opportunities of recording the history of patients suffering from malignant disease, must remember cases in which traumatism has been the starting-point of malignancy. During my period of office, as registrar of St. Bartholomew's Hospital, several cases came under observation, in which malignant growth more or less rapidly supervened upon injury. I select the following as examples of malignant growth following blood-extravasation.

CASE I.—A woman, aged 40, admitted under the care of Mr. Willett, stated that she was quite healthy a year previously to her admission. At that time, after a walk in a new pair of boots, she noticed a blood-blisther (of the size of a sixpence) on the sole of her right foot. She was very certain that, previously to the blister, her foot was sound. After a while, the blister broke, leaving a raw surface, which never healed, and gradually increased in size. On admission into the hospital, a growth (of the size of a florin) was seen on the foot, in the site of the blister. It was moderately hard, and covered with a thin bluish cuticle. The growth was removed, with a narrow margin of healthy skin round it; and a flap of skin, cut on the near side of the foot, was turned downward, so as to cover the wound on the sole. The wound healed satisfactorily, and the patient was discharged from the hospital in fair health; there was, however, a slight enlargement of one of the femoral glands. In six months, she was readmitted. At the margins of the cicatrix on the foot were several little nodules of recurrent disease; but the portion of skin brought down to cover the wound was healthy. In the groin, the femoral glands formed a mass of disease of the size of a small orange, and about the upper part of the body were a few small subcutaneous nodules. She was greatly emaciated. During the next few weeks, hundreds of small nodules appeared beneath the skin of the trunk, the limbs remaining free. Symptoms of internal complication rapidly supervened, and she died, nine months after the original operation.

At the *post mortem* examination, the subcutaneous nodules described were found to be little masses of sarcomatous material, lying beneath the skin. The surface of both lungs were found studded with nodules as large as peas. These nodules were just beneath the pleuræ, and apparently growing in the course of the lymphatic vessels. Similar nodules were found growing beneath the pericardium and the endocardium. The right femoral and inguinal glands, and the lumbar glands of both sides, were converted into masses of disease. Secondary growths were thickly studded in the kidneys, pancreas, and liver. The intestines presented an extraordinary appearance, looking as if they had been thickly covered with boiled sago, caused by thousands of nodules in the peritoneal coat. The mesenteries were similarly affected, and the great omentum was converted into a white nodular mass, weighing four pounds.

Portions of the disease, from the sole of the foot close to the cutaneous margin, presented (under the microscope) an appearance closely resembling alveolar cancer—that is to say, a series of spaces, formed by fairly well-marked fibrous tissue, filled with cells approximating an epithelial type. If, however, the slide were moved, so as to obtain a view of a deeper portion of the tumour, the alveolar structure was lost, and it presented the structure of a round-celled sarcoma—that is to say, a collection of small round-cells, without definite arrangement, and only here and there divided by fibrous trabeculæ. These cells, both in their shape and staining, closely resembled the nuclei of the epithelial-looking cells towards the surface of the tumour, and, I believe, were derived from them. Sections of the secondary deposits had a similar structure, or rather want of structure, to that seen in the deeper parts of the pri-

mary growth. They consisted, in fact, of a collection of small round-cells, described pathologically as sarcoma. These sarcomatous masses, when examined under the microscope, often present appearances exactly similar to the collection of lymphoid cells normally found in the sub-mucous tissue of the healthy intestinal tract.

CASE II.—E. M., a police constable, was kicked in the left breast whilst arresting a prisoner; the blow was not severe, nor did it prevent his continuing his duty. On the following day, there was a bruise of small size surrounding the nipple. The dark mark of the bruise remained for some weeks. A little more than two months later, he noticed a lump, of the size of a marble, on a portion of the site previously occupied by the bruise. He was perfectly certain that there had been no hard swelling of any kind at the time of the injury; for he had carefully examined the part during the first few days after the blow. The swelling steadily increased; and, when admitted to the hospital a year after the accident, there was a large sarcomatous tumour, of the size of a foetal head, with two large lumps in the axilla.

Notwithstanding the undoubted connection, in these two cases, between the injury and tumour-formation, yet it is exceptional to trace the starting-point of malignant disease from a local injury. Such a connection cannot be traced in more than 7 or 8 per cent. of cases. Small as this percentage is, it is sufficient for our present purpose, as showing conclusively that an injury may be the starting point of malignancy. The question immediately arises, seeing that malignancy may be the sequel to an injury, how it comes to pass that thousands of injuries are inflicted without being followed by such an untoward result? Mr. Butlin and Mr. Barwell answer such a question, by assuming that an injury, which in an ordinary person would be followed by no ill consequence, is, if it fall on a patient with a "constitutional cancerous diathesis", likely to produce a malignant growth. Mr. Butlin, in his paper, thus expresses this belief: "That there is probably a strong predisposition to the development of tumours in persons who thus break out in tumour-growth on the application of a violence." He further states: "The evidence in favour of this theory is as strong as that which supports a like belief in a strumous or rheumatic diathesis."

This theory has long been held, and often advocated, among others, by Sir William Jenner, who, at the discussion at the Pathological Society in 1873, called this constitutional state "a disposition, under irritation, to form cancer."

From the manner in which this diathesis is spoken of, and its being compared with gout and rheumatism, it is clear that those who believe in its existence must regard it as something that belongs to the body generally—a so-called constitutional state. In the two cases I have recorded, constitutionalists would see evidence of a specific diathesis, called into activity by the injury; for they would truly say, that a thousand such injuries might fall on as many individuals without producing cancer; and from this they would argue, that there must be a second factor, besides the blow, to produce such an exceptional result. All would acknowledge that some such second factor does exist; but the point I wish to raise is, What is the evidence to show that this resides in some peculiar diathesis affecting the body generally, rather than in some specific influence started in the site of the injured part?

So long as the doctrine of an inherited cancerous tendency was taught and universally accepted, it afforded strong support to the view that a peculiar constitutional condition was required, fit for the growth of cancer. In the fourteenth volume of *St. Bartholomew's Hospital Reports*, I criticised at some length the evidence upon which this doctrine of inheritance was founded; and, by comparing the various tables published on this subject with the records of cases in the hospital registration volumes, concluded that the disease was not inherited; the offspring of cancerous parents being no more liable to suffer from the disease than the children of other people.

If this tumour-forming constitutional condition really existed, it would seem that any blow struck on the patient with such a diathesis should be followed by tumour-growth; but this is not the case, for wounds, contusions, inflammations, and suppurations have frequently occurred in persons actually suffering from cancer, yet, save in the rarest instances, no second cancerous growth has resulted in the injured part, unless the injury have occurred in the immediate neighbourhood of the primary disease. It might be assumed, that when the morbid constitutional state has found expression so to speak in the primary tumour, that the diathesis vanishes, and that the body "under irritation ceases to produce further tumour formation". Such a view is entirely contradicted by fact; for secondary growths flourish and develop coincidently with the increase of the original tumour, which could not be the case if the primary growth monopolised the diathesis. These secondary growths are certainly not independent outbreaks, and are clearly derived by infection from the primary tumour. They first show themselves at exactly the points where we should expect foreign particles

or abnormal cells to be arrested in the lymph or blood-stream passing from the tumour.

Thus we see that the glands of the axilla are first affected in cancer of the breast, and the liver-substance in malignant disease of the intestine. Of course, after a while, the glands and the liver, becoming disorganised, are no longer able to filter out the obnoxious particles, and, eventually, general dissemination takes place. Again, by microscopic examination, the structural peculiarities of the secondary deposits often admit of their being identified with the primary tumour; for instance, in secondary cancer of the liver, not only can the large epithelial cells of the rectum be recognised, but they actually attempt to develop into an adenoid growth having all the characteristics of Lieberkühn's follicles. From these facts, it would seem that the early secondary growths develop from morbid cells derived from the primary tumour. Subsequently, no doubt, the cells of the tissue in which the secondary deposits develop become infected, and thus, after a while, the identity of structure of the secondary deposits with the parent tumour is lost.

The source from which these cells spring, and the cause of their collection into tumours, is the real pathological problem, of which the so-called diathesis is no explanation. Neither do I think that the multiplication of names by which modern pathologists designate malignant tumours gives much assistance in understanding their real nature. What the surgeon removes, and the microscopist cuts into sections, must not be regarded as the disease, but rather as the product of some hitherto unexplained irritation, a portion of which is almost certainly left behind, and which will in time cause a reproduction of the disease. In one way, however, we are much indebted to the microscope, for it has at least taught us that there is nothing obscure in the structural formation of the primary tumour, and that it is formed by the undue collection of the cells normal to the part in which it grows.

I have elsewhere published the results of microscopic investigations, that have led me to entertain the view that the function of the epithelial cells, whether of the intestine, skin, or gland-tissue, is not merely excretory, but that they have a higher function, inasmuch as they are the parents or producers of the leucocytes of the body, and that their nuclei, multiplying, are passed into the submucous or subcutaneous tissue, eventually finding their way into the circulation. Moreover, I have suggested, under certain circumstances, that these nuclei will develop into the likeness of the parents whence they spring. If this view should prove to be correct, or even partly correct, it would in some measure afford an explanation of secondary malignant growths; the young cells, infected at birth, are unable to pass freely into the body, and, becoming arrested, multiply *in situ*, forming the primary tumour; while such as escape are for a time arrested in the glands, where they develop into the likeness of the parents from whence they were originally derived.

As to the nature of this infection, at present we have no direct clue; but analogy would suggest some specific poison, for the course followed by cancer closely resembles what is observed in other diseases known to be due to specific inoculation—for instance, as in pyæmia. In both we have a primary infection, glandular implication, and eventually a general dissemination about the body. In cancer, however, the duration of the disease must be reckoned by months or years, while pyæmia runs its course in days or weeks. In both, the secondary deposits consist in cell-accumulation; in the one, slowly collecting and organising into a distinct tissue; in the other, rapidly accumulating into the formation of abscess.

Again, with reference to a traumatic causation, thousands of blows may be struck on bones without causing acute pyæmic necrosis, just as we see that similar injuries are rarely followed by malignancy. In cases of acute pyæmic necrosis, the primary subperiosteal abscess often teems with minute organisms, and yet there has been no lesion of the skin by which such bodies could have been admitted from the external air. Thus, one is driven to the conclusion that the poisonous organism must have been circulating in the blood, in which it was innocuous; but, when the extravasation caused by the blow allowed it to become stationary, it multiplied, producing all its poisonous local effects. I would venture to raise the question, as to whether the explanation of traumatic malignancy might not lie in some organism accidentally circulating in the blood becoming the cause of active disease, by infecting the cells of a part when left stationary, by effusion into the tissue.

The objection will at once be raised, that such an organism has never been seen, nor has cancer ever been propagated by inoculation. The first is no real objection, for it may merely infer imperfection in our method of observation; nor do I consider the negative experiments with regard to inoculation as conclusive. The demonstration that is occasionally carried out by nature would suggest that such inoculation might take place, if the diseased and sound epithelial cells were kept

sufficiently long in contact. In an instance recently recorded at St. Bartholomew's Hospital, an epithelial ulcer had developed over the internal condyle of the humerus, in a case in which the arm had been closely bandaged to the chest, and kept in contact for two months with an ulcerating cancer of the breast. This auto-inoculation is not of very rare occurrence, but has not hitherto received as much attention from pathologists as the importance of the phenomena would suggest.

POST PARTUM HÆMORRHAGE.

By JOHN BASSETT, M.D.,

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UNDERSTANDING that the term uterine hæmostatics may be construed broadly, and as comprehending the consideration of the causes and prevention, as well as the treatment, of flooding after delivery, I venture to offer some remarks with the object of ascertaining, as far as may be, the causes which induce an unnatural loss of blood at or near the time of delivery, and then of inquiring whether we have any means in our power of preventing such occurrences.

It is admitted by all obstetric writers that hæmorrhage at the time of delivery is one of the most formidable of the complications which beset the parturient woman, not only from its frequently having a fatal termination, but also from the great damage which it occasions to the general health, and the liability to the development of latent hereditary tendencies, which display themselves under the debility occasioned by great losses of blood. Further, such cases are a cause of so much anxiety and perturbation to the accoucheur, that he requires to be armed with all the foreknowledge which a careful examination of the subject can furnish.

It is assumed that the loss of more than a limited amount of blood at the time of delivery is an unnatural circumstance, and one that brings any case in which it occurs within the domain of pathology.

Hæmorrhage at or near the time of delivery may be roughly divided into four orders: first, those cases in which it occurs from an unusual situation of the placenta; secondly, those cases where it happens from lacerations and injuries to the uterus or placenta, or to the uteroplacental vessels; thirdly, those cases in which it is brought about from certain circumstances which transpire during the progress of the labour and delivery; and, fourthly, those cases in which it is produced by constitutional states of the mother, such as diseased conditions of the liver and kidneys and other important viscera, but more especially by general anæmia, and more rarely by a too plethoric state of the system. It is no part of my present purpose to dwell upon other causes of hæmorrhage, such as the association of pregnancy with fibrous tumours, or cancer, or obliquities of the uterus; nor shall I dwell upon the first two of the divisions which I have named. With reference to the third, I observe that a variety of circumstances transpire during the course of an otherwise natural labour which have a strong tendency to disturb the uniform and rhythmical action of the womb. The well-known influences of hope and fear are under daily observation; and, among other causes, are the tendency which exists in certain classes of society to administer alcoholic stimulants, whereby the force and frequency of the circulation are greatly increased; the tendency which has existed, and does still exist, to help the labours by the use of the finger and the too frequent use of the ergot of rye; also, too rapid emptying of the uterus, from diminished power of resistance, or too rapid delivery by the forceps, or, on the contrary, undue delay in the use of the forceps. Errors in the management of the delivery of the child and of the placenta, are fruitful sources of hæmorrhage, in not permitting the womb to expel the trunk of the child slowly; in not following the nates by the hand, so as to get the placenta detached at the same time that the child is expelled; in not allowing the womb a suitable interval of rest after the expulsion of the child; in pulling at the umbilical cord to ascertain if the placenta be detached; in forcibly extracting the placenta without the concurrent action of the uterus; in not dealing promptly with the placenta when it has become partially detached and the womb is being filled with blood; in not administering ergot of rye and opium, when their use is plainly indicated by the paralysed or spasmodic state of the womb. These various causes are quoted as having a direct tendency to bring about an irregular and imperfect contraction of the womb, whereby hæmorrhage is greatly promoted. In nearly all such cases, a spasmodic state of the womb has been established, in which one set of fibres is acting, perhaps, violently, whilst others are either passive or relaxed. Blood is poured out, which in its turn becomes a source of irritation to the interior of the uterus.

By far the largest number of cases of hæmorrhage come in the fourth division which I have named, and arise from an altered state of the