Dr. Lamond Lackie read a note on "Two Unusual Cases of Pelvic Abscess." Both were primarily cases of right-sided puerperal parametritis, which went on to pus formation. In the first, the pus burrowed backwards along the posterior part of the iliac fossa, and ultimately burst through the lumbar aponeurosis, and then, turning forward, appeared in the triangle of Petit. In the second, the area of abscess formation was surprisingly limited, for the inflammatory process had been going on for months. The patient suffered very acute pain in the region of the greater sciatic notch. No fluctuation could be made out per vaginam, but there was distinct oedema of the skin on the buttock. On cutting down towards the notch a small quantity of pus escaped, and on passing forceps through it, about half an ounce of pus welled out. Both patients became rapidly well after incision.

Dr. Fordyce referred to similar cases he had met, and remarked upon the rapidity with which these abscesses dried up after opening, without tendency to fistulous formation.

Mr. Scott Carmichael suggested that in Dr. Lackie's case the starting-point of the abscess might have been the iliac glands and not the parametric tissue. They might have arisen there secondary to slight uterine infection.

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CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

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ON THE EXAMINATION OF THE FECES AND ITS CLINICAL SIGNIFICANCE.

(A Summary of Recent Work.)

The importance of examining the faeces in disease is now generally recognised, and many diseases that previously were undiagnosed have been brought to light by this method alone. It is only, however, within the last ten years that real advance has been made by the invention of new methods of research, commencing with the elaborate treatise of Schmidt and Strassburger, which was published in 1901. This book is still the standard work on the subject, and it describes the scientific methods adopted by the authors in their analysis of the faeces in health
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and in disease. Their methods, as well as their views, have been keenly criticised by other clinicians, who found their results at variance with their own, and some of their methods quite beyond the range of the ordinary physician. New methods of observation, however, have replaced with equal delicacy the more complicated ones devised by the authors, and now it is possible for any practitioner, with a reasonable knowledge of chemistry and bacteriology, to employ the tests for himself. At any rate, with the facilities now afforded by the chemical and bacteriological laboratories associated with the more modern hospitals, these tests can be carried out readily by those in charge. No doubt the offensive nature of the excreta has had much to do with the tendency to overlook this particular line of investigation; but this objection need not stand in the way, as the examination can be made by methods that are accompanied by little or no odour. Another objection may be the want of accuracy in the results, owing to the differences in the amount and kind of foodstuffs consumed, the variance in different persons in the amount of intestinal juices secreted, and in the innumerable ways bacteria, which abound in the faeces, may alter the chemical composition of the excreta. These objections are well founded, but are partly overcome by the scientific application of test meals, whose composition are accurately known, and by methods devised for estimating the bacterial contents of the bowel. In many instances little information may be gained, and all will agree that the methods give less accurate results than those obtained by the examination of the urine. At the same time diseases may be diagnosed and facts observed that could not be appreciated in any other way. It is possible, as shown by many writers, to differentiate between the diarrhoeas of gastric origin, diarrhoeas due to disorder of the intestinal or pancreatic juices, putrefactive and fermentative dyspepsias, and thus to treat these conditions from a scientific basis.

Hughes has recently discussed this subject, and believes that nervous diarrhoeas, so-called, are due mostly to inflammation of the intestinal tract, the result of chemical changes; and likewise Schmidt believes that many cases of constipation depend, not wholly on muscular or nervous affections of the intestines, but to digestive derangements, owing to too rapid or complete digestion of foods rich in cellulose. In this way little fecal matter is produced, and the process of defecation is thereby hindered. To obviate this he recommended the use of agar-agar, which swells
in the intestine. Substances containing agar-agar as the chief ingredient, regulin, thaolaxine, etc., have recently been introduced for the treatment of habitual constipation.

Among many papers that have thrown additional light on this subject might be mentioned at this stage Herter's book on *The Common Bacterial Infections of the Digestive Tract and the Intoxications Arising from Them*, which gives a truer conception of the nature of the bacterial processes in diseases of the digestive tract; Baumstark's article, devised as an easy means of examination of the faeces by the practitioner; and mention may be made of Cammidge's papers which deal more especially with the examination of the faeces in pancreatic disease, his most recent contribution having appeared while this abstract was being written.

Composition of the faeces (Howell)—

*Normally* the faeces consist of indigestible ligaments of meat and cellulose from vegetables; undigested material such as meat, starch and fat; products of intestinal secretion; products of bacterial decomposition; cholesterol; excretion; mucus and epithelial cells; pigment—sterocobilin derived from pigment of the bile; inorganic salts; large quantities of micro-organisms; the following gases, \( \text{CH}_4, \text{CO}_2, \text{H}, \text{N} \) and \( \text{H}_2\text{S} \).

*Pathologically* the faeces may contain an abnormal amount of these normal constituents: blood (visible or occult); pathogenic bacteria; animal parasites and ova; biliary and intestinal concretions.

In all cases, before examination of the faeces, a test diet should be given which represents a definite amount of calories. The diet especially used is Adolph Schmidt's diet, which consists of—

**Morning.**—\( \frac{1}{2} \) litre milk or \( \frac{1}{2} \) litre cocoa and 50 grms. rusk.

**Before Noon.**—\( \frac{1}{2} \) litre gruel (40 grms. groats), 10 grms. butter, 200 grms. milk, 1 egg and 300 grms. water.

**Noon.**—125 grms. minced beef (raw inside) in 20 grms. of butter, 190 grms. potatoes mashed with 100 grms. milk and 10 grms. butter.

**Afternoon.**—Same as morning.

**Evening.**—Same as forenoon.

Altogether 1\( \frac{1}{2} \) litres milk, 100 grms. rusk, 2 eggs, 50 grms. butter, 125 grms. minced meat, 190 grms. potatoes, 80 grms. oatmeal.

This represents 2234 calories.

With the diet a little hæmatoxylin or carmine is given as an index of when to examine the faeces under this new diet.
For examination purposes the faeces should be passed into a clean vessel and washed, either by stirring up in saline solution and filtering, or by using the specially devised sieve of Boas, whereby a continuous fine stream of water is allowed to flow over the faeces—the smell can be overcome by 5 per cent. phenol solution or a little turpentine.

Before washing the faeces the reaction is taken, the colour noted, and the general appearance and weight observed. Any shreds of mucus, concretions, or animal parasites are observed.

**Reaction.**—The faeces are usually faintly acid or faintly alkaline or amphoteric. Typhoid and cholera stools are usually alkaline. The stools accompanying a milk or starch diet are usually acid. Cammidge has observed that in pancreatic disease the stools are usually acid: if alkaline, the pancreatic disease is usually associated with biliary obstruction.

**Colour.**—Normally this varies from a lightish yellow to a brownish-black colour, depending on the character of food taken. The normal pigment is hydrobilirubin or reduced bilirubin (identical with urobilin).

This pigment may be detected thus:—Small piece of fresh faeces is rubbed in a mortar with concentrated watery solution of corrosive sublimate and allowed to stand for several hours. Hydrobilirubin gives a deep red colour (hydrobilirubin-mercury), while bilirubin gives a green colour.

Pathologically the colour is important:—It is golden-yellow from unchanged bilirubin, green from biliverdin or bacteria, and putty coloured from deficient bile, pancreatic disease, and tuberculous peritonitis. Cammidge has observed white stools in pancreatitis with no jaundice or biliary obstruction; but even in these cases hydrobilirubin was present. Von Nencki has shown that hydrobilirubin may be converted by bacteria into a whitish substance “leuco-urobilin.”

**General Appearance and Weight.**—The appearance varies from a soft liquid stool to a hard constipated stool. It may be ribbon-like from stricture of the rectum, or have the appearance of round hard balls from dilatation of the sigmoid and rectum. The weight varies with the diet. On an exclusive meat diet the average weight is 100 to 150 grms., on mixed diet 170 grms., and on vegetable diet 400 to 500 grms.

**Mucus.**—When mucus appears in any quantity in the stool, this is pathological. If it is intimately mixed with the faeces it comes from the small intestine; if it surrounds the stool it comes
from the large intestine; if wholly mucus it indicates dysentery, ileocolitis or ulceration of the rectum. Large casts may be passed in mucous colitis.

So far, then, inferences may be drawn from the macroscopical appearances and reaction of the faeces; of still greater importance are the microscopical appearances, the chemical analysis and the bacteriological examination.

Microscopical Appearances.—Thin stools are allowed to settle or are centrifugalised; deposit is examined on a slide; a portion of a firmer stool is first rubbed up in a glass mortar with physiological saline solution and then centrifugalised.

Remnants of food are seen, connective tissue, muscle fibres, starch granules and fats.

(a) If there be much connective tissue following the limited supply of meats (100 grms.), then this points to disturbed gastric digestion, since the gastric juices alone can digest connective tissue. Achylia or hypochylia would do this, or excessive peristalsis.

(b) If many muscle fibres be seen with a limited supply of meat in the diet, then this points to disturbance of the function of the small intestine, probably of the pancreatic digestion. If both (a) and (b) are present it can be inferred that the stomach and intestines are both at fault.

(c) Normally a few starch granules are present in the faeces. If they are markedly increased this indicates disturbance in the small intestine, and a diminished digestive power for carbohydrates.

(d) Fat is present normally to extent of 23 per cent. of stools in dry substance. Increase of fats indicates interference with its absorption from the foods, i.e. interference with biliary secretion, and disturbance of the intestinal mucosa. Microscopically that is evidenced by increase in sebacic acid flocculi, neutral fat droplets, etc.

Cambridge has found that in all pancreatic diseases the amount of fat is high. It reaches its maximum in malignant disease of the pancreas.—In 38 cases it averaged 71.3 per cent. The average in 52 cases of chronic pancreatitis associated with gall-stones in common duct and jaundice was 56.6 per cent., while in 8 cases of cirrhosis of the pancreas it averaged 36.2 per cent. He observed also the ratio of unsaponified to saponified fats was even of more importance than the total amount of fat.

Normally the amounts of each kind of fat are about equal. In disturbed pancreatic flow there is increased proportion of unsaponified fat; in obstruction to the bile flow there is increased proportion of saponified fat. In cancer of the pancreas and
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affections of the bile-duct the amounts are about equal. In 7 cases of disease of bile-duct alone 5 showed excess of saponified fats. In early stages of catarrhal pancreatitis, from increased flow of pancreatic juice, there is usually increase of saponified over unsaponified fats.

It is from the chemical analysis, however, that most information can be gained about the amount of fat in the faeces.

*Epithelial cells may be seen.*

Squamous cells come from the anal orifice, otherwise little information can be gained.

Occasionally a few red blood corpuscles may be detected, or pus cells, or ova of parasites or various crystalline bodies, such as triple phosphates, calcium phosphate, magnesium phosphate, calcium oxalate, cholesterol, Charcot-Leyden crystals (suggest intestinal parasites), haematoidin crystals.

Baumstark has devised a rapid method of observing the remnants of food stuffs in the faeces. He makes three microscopical preparations:

1. A small piece of faeces pressed between slide and cover-glass. *Normally*—Muscular fibres, lime salts, sebates of lime, uncoloured soaps, single potato cells empty, remnants of chaff from gruel and remnants of cocoa. *Pathologically*—More muscle fibres and clearer striae, neutral fat drops, sebacic acid and abundant soap, needles, and potato cells, with more or less preserved grains of starch.

2. Faeces rubbed up with a little drop of 30 per cent. acetic acid solution, and held over the flame until it boils. *Normally*—Large lime salts and soap flakes are melted into neutral fat drops. *Pathologically*—Abundant sebacic acid flocculi.

3. Faeces rubbed up with a little drop of a strong solution of iodine in iodide of potassium (I 1 part, KI 2 parts, distilled water 50 parts) and covered. *Normally*—Brown coloured from iodine; the potato cells now violet (not blue). *Pathologically*—Bluish-coloured potato cells, blue or violet sporules or bacterial flora, and fat cells which are yellow from the iodine.

It is, however, in the chemical and bacteriological examination of the faeces more especially that advance has been made, and fresh information gained in obscure diseases.

*Chemical Analysis.*—**For Blood.**—Until comparatively recently the presence or absence of blood in the stools was recognised only by the naked eye. The faeces might be streaked with blood, or there might be a profuse hæmorrhage with clots of blood; the
former might be coffee-ground or tarry, depending on the situation and the amount. In such cases microscopically no red corpuscles are found, as they have previously been destroyed in the upper part of the intestinal tract.

Since Boas’s researches in 1903, we know the real significance of small hæmorrhages, “occult blood,” from the gastro-intestinal tract.

Goodman has recently written a paper on the examination of the faeces for “occult blood,” with special reference to the value of the benzidine test. He first describes the various tests that have been used for recognising blood in the faeces—Weber’s guaiac test, Rossel’s aloin test, etc.—and compares these with the benzidine test of O. and R. Adler. For practical purposes he recommends Schlesinger and Holst’s modification of Adler’s test, which is:

(a) Concentrated solution of benzidine is made by using as much benzidine as will go on the end of a knife in about 2 c.c. of glacial acetic acid. The mixture is soluble and should be shaken freely.

(b) A small piece of faeces is suspended by stirring in a test tube one-fifth full of water; the test tube is closed with cotton and the faeces boiled.

(c) 10 to 12 drops of benzidine solution are poured into a test tube, and 2·5 to 3 c.c. H₂O₂ (3 per cent.) added.

(d) To this are added 1 to 3 drops of the boiled faeces, after mixing by slightly shaking.

With blood the colour becomes green, blue-green or blue—the blue being more pronounced if more blood is present. The reaction is present in 1 to 2 minutes. Negative tests show no change even after standing for twenty-four hours.

The guaiac and aloin tests respond to the dilution of 1 in 25,000; the benzidine test responds to the dilution of 1 in 200,000. For traces of blood in the faeces, then, this test is to be relied on. The author comes to the following conclusion:—If the benzidine test is negative no occult blood is present, but if it is positive this may mean nothing, unless corroborated by one or both of the other tests. If a positive test is obtained with benzidine the diet and medication must be regulated, as meat and certain chemicals, such as iodide of potassium, give the reaction, as does mucus, pus, iron and copper salts, etc.

Estimation of Fats.—The qualitative test, as devised by Klopstock and Kowarsky, for fats is easy. The faeces are mixed with a small quantity of ether and allowed to settle; a small portion of
the ether is withdrawn with a pipette, and a drop allowed to evaporate on a piece of filter paper. A transparent spot, which cannot be washed out with water, remains.

The quantitative estimation of the fats in the faeces is a more complicated process, and various methods have been devised. In 1907, however, Walker Hall emphasised the importance of Hecht's method, which he claims to be easily carried out, and gives accurate results. His method is as follows:—

1. Administer a known quantity of fat in the food.
2. Transfer the entire stools to a mortar, add normal KOH solution, and stir until all lumps have disappeared. Make up to 500 c.c.m. with distilled water. Shake well.
3. Take 50 c.c.m. and heat for 20 minutes.
4. Add 50 c.c.m. of 5 per cent. alcohol. Heat for 20 minutes.
5. Add strong HCl until markedly acid.
6. Heat for 20 minutes, filter, evaporate down to 50 c.c.m.
7. Take 20 c.c.m. in a Schmidt-Werner tube, and make a Schmidt-Werner estimation. After calculation from the dried residue of the aliquot portion of the ethereal extract multiply by 25.

If the process be stopped at 3 then the amount of fat extracted approximates that of the fatty acids. Deduct this from the quantity yielded by the whole process and an approximate amount of the neutral fats is given.

Quantitative Estimation of Nitrogen.—This is done by the Kjeldahl method, a description of which is to be found in most physiological text-books.

Quantitative Estimation of Starches.—The test method is the "Fermentation test of Schmidt." After a test meal it is recommended for estimating the efficiency of the digestive apparatus. The form of apparatus is well known. Five c.c. of formed faeces are prepared with sterile water and poured into Strassburger's instrument. The small tube surmounting the bottle is filled with water, the parallel tube remaining empty. If the apparatus is kept at blood-heat for 24 hours, gas will rise and displace the water in the first tube, forcing it into the outer parallel tube. Thus the amount of water displaced is a measure of the amount of gas formed. One-third displacement is pathological.

Estimation of the Gases in the Faeces.—In 1909 Bassler has described an apparatus for the chemical and bacteriological examination of the gastric contents and faeces. The main part of
the apparatus consists of the well-known form of fermentation tube, the upright limb of which has a 15 c.c. capacity, graduated in per cents., and the bulb a 30 c.c. capacity. The tube is less than 6 inches in height, and constructed so that 25 c.c. sufficiently fills the instrument. Fæces (7.5 grms.) are mixed with water (25 c.c.) and run into the instrument. The whole is placed in oven for twenty-four hours at 37° C. The total gas content is observed. By means of a pipette 1 to 2 c.c. of saturated solution of sodium hydrate are introduced to extract the carbon-dioxide gas. The other gases can be collected and tested for by simple means.

Bassler finds that the gases in the fæces vary greatly with the character and amount of food, the character and amount of bacteria present, and the pathological condition of the lower digestive canal.

He finds the percentages of gases in the various diets as follows:

|            | Milk. | Meat. | Vegetable. |
|------------|-------|-------|------------|
| Hydrogen   | 50 per cent. | 2 per cent. | 3 per cent. |
| Nitrogen   | 37    | 50    | 37         |
| Marsh gas  | 09    | 31    | 50         |
| Carbon dioxide | 12   | 10    | 27         |

Sulphuretted hydrogen is present in small amounts. After a Schmidt and Strassburger diet he finds normally about 20 per cent. to 30 per cent. of gas. In saccharobutyric putrefaction the gas content is from 5 per cent. to 13 per cent., and in gastro-enteric atrophy it is about 80 per cent. On a meat diet the amount of gas may fall to 15 per cent., while on a strict carbohydrate diet it is usually much higher.

Purin Bodies in the Fæces.—In 1903 Walker Hall describes a method of estimating these bodies, but no special information, at least to the clinician, can be gained by this process.

Bacteriological Examination of the Fæces.—Friedenwald and Leitz have recently written a paper describing the importance of finding out the bacterial content in health and disease, and the effect that various so-called antiseptics have on the bacterial content.

Pasteur was of opinion that bacteria in the intestinal tract were essential to life, and his contention has been supported by the fact that animals fed on sterile food only are weakly, with stunted growth.

Klein and De Lange found that 13 per cent. of dried substance
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of the faeces was composed of bacteria. Two years later (1902) Strassburger repeated the experiments and found that former methods and results were unreliable. He weighed a certain quantity of faeces, macerated them in water and centrifugalised. The bacteria remained suspended in the fluid, while the heavy substances fell to the bottom. This was decanted, treated with alcohol and centrifugalised. The bacteria fell to the bottom, and could be collected. The bacteria were dried and weighed. The following conclusions were arrived at:

1. Under normal conditions \( \frac{1}{3} \) of the dried substances of the faeces of a healthy individual, ingesting a medium diet, consists of bacteria.

2. In adults the quantity of daily bacterial waste when dried (a) under normal conditions, 8 grms.; (b) in dyspeptic conditions, 14 to 20 grms.; (c) in chronic constipation, 2.6 to 5.5 grms.

3. In chronic constipation the bacterial substance is usually abnormally small.

4. In infants under normal conditions there is practically the same percentage of bacterial growth as in adults.

5. The total number of bacteria evacuated by a normal individual per day has been estimated as 128,000,000,000.

6. Knowing the quantity of bacteria in the faeces gives an insight into the bacterial development of the whole intestine.

Strassburger believes that the best method of reducing the bacterial growth of the intestine is by means of diet. The value of antiseptics is doubtful. Herter says, "I have found in certain instances that salicylates, aspirin and salol, have excited some action in diminishing the output of indican, but beyond this I have not been able to satisfy myself that the effects of intestinal antiseptics is pronounced."

Dutton Steele found that beta-naphthol and bismuth salicylate did reduce the bacterial growth in the intestines in normal individuals, but he is convinced that "evacuation of the bowels with regulation of the diet are by far the most efficient means at our command to check excessive bacterial activity in the intestines."

Friedenwald and Leitz made a large number of experiments on this point, using Steele's modification of Strassburger's method. Their results were as follows:

1. Normal Cases.—Greatest reduction in the bacterial content was from diet alone.
   With liquid diet the reduction was 16 per cent.
   With beta-naphthol a reduction of 9.9 per cent.
With bismuth salicylate a reduction of 8·8 per cent.
With aspirin, 4·6 per cent.
With salol, no reduction at all.

2. Gastro-Intestinal Cases.—Regulation of diet and evacuation of the bowels was the most effectual method of reducing high bacterial content of the intestines.

Beta-naphthol and bismuth salicylate seem to be the most effective intestinal antiseptics. Otherwise the results in gastrointestinal cases are similar to those in normal cases.

Dutton Steele noted in one case of achylia a bacterial content of 38 per cent., in a case of hyperchlorhydria one of 28·5 per cent.

Different Organisms in the Feces.—The greatest number of intestinal micro-organisms belong to the bacterium coli group. In addition there are the bacterium aerogenes, bacterium fecalis alkaligenes and bacterium fluorescens. The most important pathogenic bacteria are the bacilli of typhoid, cholera, dysentery and tubercle; more rarely streptococci and staphylococci, the micro-organisms of anthrax, plague and the bacillus pyocyaneus.

Tubercle Bacilli.—Even though there be undoubted intestinal tuberculosis, Sahli has found that these cannot always be demonstrated in the faeces. They are chiefly found in purulent or bloody pieces of diarrheal stools. They can be sometimes demonstrated in solid pieces, if, as Hamburger recommends, a small piece of faeces is mixed with a few centimetres of water, then centrifugalised. The supernatant fluid is diluted with a double volume of alcohol, centrifugalised again, and then, after drying, examined under the microscope, when numerous tubercle bacilli will be seen. Care must be taken to distinguish these from the smegma bacilli, which occur at the anal orifice and become mixed with the faeces.

Fabricci found tubercle bacilli in the faeces of children when there was no sputa. He believes the best method of detecting the tubercle bacillus in faeces is that of Strassburger, with the additional use of a 20 per cent. solution of antiformin, which has the effect of destroying other bacteria present and leaves the tubercle bacilli unhurt. A small pellet of faeces is dissolved in 15 cm. of water, centrifugalised for 2 to 3 minutes, and then treated with an equal quantity of 20 per cent. antiformin solution for 15 to 20 minutes. To this fresh mixture an equal quantity of absolute alcohol is added, centrifugalised again for 2 minutes, and a microscopic preparation made from the sediment. The faeces of 35
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children suffering from tubercle were examined, when a positive result was obtained 11 times. In 9 adults (all tuberculous) the tubercle bacillus was found 7 times in feces.

On going to press, a paper has just appeared in the *British Medical Journal* by Drs. Philip and Agnes Porter on “Tubercle Bacilli in the Feces in Tuberculosis.” They examined the feces of 109 persons, 99 of whom had pulmonary tuberculosis, 1 tuberculous peritonitis, and 9 with no tubercular infections. *In no case was there evidence of intestinal tuberculosis.* Of the 100 tuberculous cases, 79 yielded tubercle bacilli, and only 21 were negative. The 9 normal cases yielded no tubercle bacilli. Of the tuberculous patients in which tubercle bacilli were found in the expectoration, every case except one presented tuberculous bacilli in the feces. In 42 cases with no tuberculous bacilli found in the expectoration, 29 gave tuberculous bacilli in the feces. In 24 cases with no sputum, 17 showed tuberculous bacilli in the feces.

Eyre and Minett recently made an investigation in the incidence of Morgan’s Bacillus No. I. in the normal feces of young children. Sixty cases were examined—23 males and 37 females, between the ages of birth and 13 years. Four stains of the Morgan Bacillus No. I. were isolated, or 6.3 per cent.

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Surgery

The Value of Momburg's Method of Procuring Hæmostasis.

This procedure, which consists in winding an elastic cord several times round the waist between the iliac crest and the lower border of the ribs, has now been some two years before the profession, and nearly 200 cases have been published in which it has been employed to control bleeding in operations involving the upper part of the thigh or the pelvis where severe hæmorrhage is expected. The time, therefore, has arrived when it is proper to inquire into the results, and, more particularly, to ask the question—"Is the method a safe one, and is it one to adopt as a routine practice?" A valuable contribution to the subject appears in the Revue de Chirurgie (May 1910), by Professor G. Gross and A. Bisset, of Nancy. They also give full details of a fatal case, in which it is almost impossible to doubt that death was directly due to the method. The patient was a woman, set. 28, suffering from advanced tuberculosis of the knee-joint, with abscesses extending up to the buttock. Hectic fever was present; she was emaciated, and her pulse-rate averaged 110 per minute. On the other hand, minute examination of her heart revealed no murmur, nor were any clinical signs of failure of compensation present. The pulse was always perfectly regular. Gross decided to disarticulate at the hip, choosing Momburg's method, as offering the best chance of saving unnecessary loss of blood. Chloroform was given by an expert, and, after elevating both lower limbs, Gross applied the rubber band himself, passing it slowly four times round the patient's waist. Pulsation in the femorals disappeared. No alteration whatever in the radial pulse took place, or in the patient's appearance. A sphygmographic tracing showed no change. The disarticulation was completed in fifteen minutes, during which time the patient gave the anaesthetist no anxiety, and hæmostasis was perfect. The cord was then very slowly removed (in 60 seconds). At the moment when it was com-