made, though it has often appeared that care has been taken that the contents of the cartridges should not come in contact with those employing them. It has, however, been pointed out that in the manufacture the 'dippers' have been recognised as being liable to be affected, and, as has been said, it would appear as if the poison is a very subtle one. Not only, therefore, should means be taken to prevent any of the powder adhering to the outside of the cartridges, but it appears very essential that they should be made in such a way as to ensure that combustion should be complete, and that their use should be restricted as much as possible to well ventilated places, so that currents of air would speedily dilute and carry away any deleterious vapours."

As a result of the report by Dr. Dupré and Commander Hamilton Smith, the Secretary of State has certified (Factory and Workshops Act, 1891) that, in his opinion, the manufacture of explosives in which di-nitrobenzol is used is injurious to health, and notice to observe "special rules" has been served on the different manufacturers. These "rules" are those recommended in the report alluded to by Dr. Dupré and Commander H. Smith.

THE LETTSOMIAN LECTURES ON PERITONITIS.

Delivered before the Medical Society of London, January, 1894.

By FREDERICK TREVES, F.R.C.S.,

Surgeon to, and Lecturer on Surgery at the London Hospital; Examiner in Surgery, University of Cambridge.

LECTURE III. PART I.—THE CLINICAL FEATURES OF PERITONITIS.

THE general symptoms of peritonitis are so well known and have been so precisely described that they call for no special consideration in the present lectures. It will be necessary only to deal with the characteristics of certain individual symptoms and to define the clinical peculiarities of certain varieties of peritoneal inflammation.

I.—THE NERVOUS PHENOMENA.

The general arrangement of the nerve supply of the parietes of the abdomen and of the abdominal viscera is somewhat peculiar. The skin over the greater part of the abdomen, over that part at least beneath which lie the chief viscera, is supplied by the lower seven dorsal or intercostal nerves. The same nerves supply the muscles of the belly, namely, the rectus, the two oblique muscles, and the transversalis. More than that, these identical nerves take a most important part in the nerve supply of the abdominal viscera and of the peritoneum.

There are certain great nerve centres within the belly with which the sympathetic is conspicuously concerned, and from which the organs of the abdomen are supplied. The chief of these centres are the solar, the celiac, and the superior mesenteric plexuses, and it is most noteworthy that the contribution they receive from the spinal nerves is derived in whole or in greater part from the lower seven dorsal nerves through the splanchnics. It is further to be observed that these particular spinal nerves are concerned in the movements of respiration, since they supply the lower series of intercostal muscles. It thus happens that an arrangement exists for the most rapid possible conduction of reflex impulses. A cold hand is laid upon the abdomen, or a blow upon the part is threatened, and the muscles of the belly wall become rigid in a moment, or it may be that there is some sudden lesion of the peritoneum or of one of the abdominal viscera, and at once the muscles of the belly wall contract, and a more or less marked hyperæsthesia of the skin develops, and there is thus provided, by the tender integument and by the rigid muscles, that protection and that securing of rest which are the first elements in the natural treatment of a damaged part.

Absolute rigidity of the belly, a limitation of the abdominal respiratory movements, and a tenderness of the surface are

among the very earliest symptoms of acute trouble within the abdomen. The tenderness of the belly wall is often excessive, and depends upon an actual hyperæsthesia of the surface rather than upon a tenderness within the abdomen. In some cases the hyperæsthesia is so extreme that the patient cannot bear the touch of the lightest hand, and is even afraid to allow the bedclothes to come in contact with the skin of the abdomen.

The rigidity of the belly and the sensitiveness of the surface vary within considerable limits, and are most marked in cases which are sudden and acute, and especially in those in which the peritoneum at the time of the outbreak was perfectly normal. The nerve condition of the individual has also to be taken into account. In chronic cases, in cases complicated with ascites, and in instances in which a sudden trouble falls upon a peritoneum which has long been exposed to irritation, the phenomena may be little marked. In certain examples of perforative peritonitis the contraction of the belly wall may be so extreme that the parietes sink in and appear almost as if resting upon the spine.¹ This great retraction of the belly is comparable with that sometimes met with in lead colic. It has been for the most part noticed in connection with perforation of the stomach.

As peritonitis advances, both the hyperæsthesia of the skin and the contraction of the belly wall lessen, and may almost entirely pass away. As the muscles yield, the phenomena of meteorism usually appear, and any tenseness of the abdomen which remains depends upon flatulent distension of the intestines. As soon as general septic symptoms become marked, both the contraction and the tenderness usually disappear. I have seen two cases of septic peritonitis due to trouble in the appendix, run their entire course with a flaccid belly wall, and with scarcely any tenderness. Both patients were men over 50, no morphine had been administered, and death took place from toxæmia within seven days in both instances. One man spent some hours in applying massage to his own abdomen, and the other drew frequent attention to the absence of tenderness by slapping the abdominal wall.

That pain which the patient feels to be actually situated within the abdomen has the peculiarity that it is not, as a rule, to be localised at first, but is commonly referred to the great abdominal nerve centres. In the early stages of strangulated hernia or of perityphlitis, for example, the patient very often refers the pain to the region above the umbilicus, and will sometimes place his hand or his finger exactly over the site of the solar or superior mesenteric plexus. I have known the pain in perityphlitis to be referred at first to the opposite or sound side. As symptoms progress, the localisation of the pain becomes usually more and more precise, assuming that the trouble still remains, to a certain extent, local. A patient who has had many attacks of perityphlitis gives a very hazy account of the situation of the pain in the first outbreak, but as time advances he often puts his finger directly over the diseased appendix. I have noticed the same phenomenon in intestinal troubles due to limited adhesions. The pain may be at first "all over," or be referred to the median line a little above the umbilicus. In due course, however, it becomes more and more accurately localised.²

Into the great question of the physiology of peritoneal shock I have no intention of entering. Certain symptoms, which are collectively known as the phenomena of shock, mark, almost without exception, the clinical beginnings of those cases of peritonitis which are abrupt in their onset, or acute, or even subacute, in their course. These symptoms are evidently entirely due to an impression upon the nervous system, and are independent of inflammation on the one hand or of septic intoxication on the other. Certain experiments by Reynier and Richel³ may be mentioned as illustrative of this statement. They injected boiling water into the peritoneal cavity of a rabbit. The phenomena of shock were at once produced, the temperature sank to 29° C., and the animal died, collapsed, within twenty-four hours. The more extensive the scald the more marked was the shock. In no case was any peritonitis produced. The injecting of perchloride of iron led to like results. There was no pulmonary congestion, no formation of clot in the heart, and no peritonitis. If before the injection a nerve sedative, such as chloral, was administered to the animal, it would live for

twenty-four hours instead of dying at the end of six or ten hours.

In the human subject the shock attending a severe peritoneal lesion may prove fatal, and the patient may die with evidence of no important disturbance other than that wrought directly through the great nerve centres. The signs of sudden and grave disturbance of the peritoneum are pain, profound exhaustion, a distressful anxiety, pallor, a small, soft, quick pulse, cold extremities, shallow respiration, and vomiting. These phenomena vary in degree, and are not absolutely invariable. They often mark the earliest symptoms of an acute and suddenly produced peritonitis, or rather indicate the occurrence of a lesion which will lead on to peritonitis. It is interesting to note that these symptoms are in some degree common to all cases in which there has been a rude and abrupt impression made upon the nerve centres within the abdomen. It may almost be said that all quite acute troubles within the abdomen commence with the same train of symptoms. A student who is well versed in the rigidly formulated signs of abdominal lesions as given in textbooks is surprised to be told that until many hours have elapsed it is often impossible to say whether a sudden abdominal crisis is due to the perforation of a vermiform appendix, or to the bursting of a pyosalpinx, or to the strangulation of a loop of intestine, or to the passage of a gall stone. The twisting of the pedicle of an ovarian cyst has led to symptoms which have been mistaken for perityphilitis; a sudden peritoneal hæmorrhage has been confused with intestinal obstruction; and the rupture of a hydatid cyst has been diagnosed as a perforation of the intestine. It is quite possible—indeed, quite usual—for these various troubles to present at first symptoms which are common to them all, and which merely indicate that a shock has been communicated to the great abdominal nervous system. Often at first there are no differentiating symptoms. There may be features in the past history of the patient which indicate a diagnosis, but in the absence of such evidence the cautious surgeon is simply assured that some sudden emergency has occurred within the peritoneal area, and that he must wait for localising signs before he can offer a diagnosis. To these common phenomena of a crisis within the abdomen Gubler¹ has applied the convenient term of "peritonism."

In the symptoms which are associated with an actually advanced peritonitis it is quite evident that the nervous system plays a prominent part. A study of intestinal neuroses makes it easy to appreciate how important that part may be. Not only may colic and diarrhoea occur in instances in which there is no reason to suspect any actual intestinal lesion, but there are cases, more or less clearly proved to be neurotic, in which there were meteorism, fæculent vomiting, and even some signs of strangulation.² I have twice opened the abdomen in cases in which there existed the phenomena of obstruction of the colon, as shown by distension of the belly, vomiting, constipation, pain, and the appearance of visible coils of intestine. In neither instance was any evidence of disease discovered within the abdomen, and in neither case did the symptoms return after the laparotomy. Allusion may also be made to those cases of chronic diarrhoea which are readily cured by chloral or bromide of potash.

It is usual in peritonitis for the mental faculties to remain perfectly clear up to the very verge of death. Among the 100 hospital cases already alluded to there were only 11 examples of intense headache or delirium. In all of these a fatal result ensued. An examination of the clinical details in these 11 cases does not reveal any common train of symptoms. They were, for the most part acute cases, but by no means the most rapidly fatal, nor were they of necessity associated with high fever or severe symptoms, or the administration of unusual doses of opium. The ages of the 11 patients varied between 9 and 53 years.

A rigor does not often mark the commencement of peritonitis. Among the 100 cases this symptom was recorded in 13 instances. In 2 of these the peritonitis had started in the appendix, in 1 it followed laparotomy, and in 10 it had its origin in the pelvis. Of the 13 patients 10 died.

II.—METEORISM.

The degree of meteorism met with in peritonitis varies

considerably, and is influenced by conditions which are not yet fully understood. When it exists its appearance is coincident with that relaxation of the abdominal muscles to which allusion has been already made. Meteorism may be absent throughout the whole progress of the case, and examples of this are not uncommon in instances of septic intoxication attended with symptoms of a low type. It is most marked in peritonitis attended by actual intestinal obstruction, in examples of perforation, in cases in which there is thrombosis of the mesenteric vessels, and also in instances in which opium has been freely administered. It appears to present no definable relation to the amount or degree of the vomiting. In experiments in which artificial distension of the gut has been brought about, not only do all intestinal movements cease, but peristalsis cannot be induced by any of the usual irritants.

It has been often assumed that meteorism depends upon obstruction in the lumen of the bowel, and that it is due to an accumulation of gases in the intestine above the occluded point. These assumptions are not supported either by clinical experience or by experiments upon animals. It is true that the distended gut is entirely paralysed, and that it remains "paralytically fixed" in the abdomen; but even when actual obstruction exists, it cannot be shown that the meteorism is the greater the lower down in the tube the occlusion is placed. In some examples of peritonitis not a little of the swelling of the belly depends upon distension of the stomach.

The elaborate and varied experiments of Kader³ and others make it evident that gas may be developed in an intestine emptied of its contents, and that meteorism, as met with in disease, depends almost entirely upon gross disturbances in the circulation of blood through the affected portions of intestine. The series of experiments which bears most directly upon peritonitis is the following. The lumen of the gut is not occluded, but the circulation in a certain segment is controlled by a ligature applied at the root of the mesentery. The blood supply to the bowel is very greatly reduced but is not entirely cut off. The whole of the intestine so treated becomes rapidly distended with gas, and a condition of widespread meteorism is produced. The animal exhibits the symptoms of severe pain, with vomiting and diarrhoea, and death results with varying rapidity.

Diffuse peritonitis favours the development of general meteorism in cases in which an artificial strangulation of the bowel has been produced. It may be convenient here to mention that the following gases are normally found in the alimentary canal, namely, O, N, CO₂, CH₄, H₂S. The first three named are believed to be swallowed as air. CO₂ may originate in the stomach as a result of digestive disturbances. CH₄ and H₂S are normally met with only in the colon. The following are the results obtained by Bokai⁷ by introducing these various gases into the intestinal canal of animals through a hollow needle: N has no effect. O causes the movements of the bowel to cease. CO₂ causes violent intestinal movements, and finally paralysis, if the action of the gas be prolonged. CH₄ and H₂S produce also vigorous movements of the bowel. Bokai believes that the purgative action of sulphur depends upon the liberation of H₂S in the intestine, and that the sedative action of bismuth depends upon its chemically fixing the H₂S existing in the bowel. Fever artificially induced in rabbits by injecting decomposing matter under the skin, causes a more or less complete paralysis of the intestine.

III.—VOMITING.

It has been many times remarked that there is no single distinctive sign of peritonitis. Could one single symptom be selected as the one more usually present in all cases of peritonitis it would probably be vomiting. In the 100 hospital cases vomiting is noted as very slight in as many as 23 per cent. of the examples. In some of these it is described as absent. This may be to some extent explained by the strict rules of dieting which are more rigorously insisted upon at the present day, and by the fact that a dresser or a nurse may not record the symptoms unless the vomiting be copious or very distressing.

By very slight vomiting is implied vomiting in which the amount actually brought up is trifling. Compared with the sickness attending intestinal obstruction the vomiting in

peritonitis generally may be spoken of as always slight. In a very large proportion of the cases which are carefully treated the patient will merely bring up a mouthful of fluid now and then. This is often accomplished with little effort, and many hours may elapse between the successive attacks. What is alarming and distressing in this slight degree of sickness are its persistence and the evil prognosis it suggests. The patient may be apparently improving, but there remains this periodical rejection of an ounce or so of fluid, which shows that the improvement is entirely delusive.

In some of the more insidious septic cases, and in such examples of peritonitis as occur in the aged or in the subjects of advanced visceral disease, the vomiting often amounts to little more than a slight irritability of the stomach. In the instances in which the sickness is excessive, and in which the vomited matter becomes intestinal, there is something more than a mere reflex disturbance concerned.

Nothnagel,⁸ Lüderitz,⁹ Bokai,¹⁰ and others have described the manner in which an antiperistaltic action in the intestine may be induced by exceptional irritation, especially such as acts directly upon the bowel itself. The normal emptying of the stomach through the pylorus has been well described as a function of the intestine.

In the cases of peritonitis following upon strangulated hernia the vomiting is for the most part very marked and often copious, but it bears no constant relation either to the state of the gut, the degree of peritonitis, or the height of the fever.

In perforative peritonitis all symptoms are usually acute and pronounced. There is intense pain, and a corresponding degree of collapse, and in the larger proportion of the cases vomiting is conspicuous. It is usually absent in examples of perforation of the stomach. In the cases connected with typhoid fever the relation between the vomiting and the action of the bowels is notable. If all action of the bowels cease, then the vomiting tends to be marked; but if the loose motions are continued, then the sickness is for the most part slight. In the most rapid forms of perforative peritonitis an actual inflammation of the serous membrane plays but little part. Death is from shock or acute general toxæmia.

In cases of peritonitis depending upon disease of the intestine, including mischief in the appendix, vomiting is not, as a rule, a pronounced symptom. In the cases of perityphlitis it is to be noted that it is least marked, as a rule, in the cases in which the bowels act with more or less regularity.

In peritonitis taking its origin from the pelvic viscera or parietes, vomiting is seldom very distressing. In the acute cases the symptoms are rather those of septicæmia, and in the chronic cases the disturbance has a great disposition to remain localised.

In peritonitis following upon operation or accidental wounds vomiting is rarely absent. It may not be marked, and may consist merely of an irritability of the stomach, but there it remains—a symptom which gives the greatest anxiety to the surgeon, and which no treatment appears capable of controlling. It may not be complained of by the patient; but, as already said, its gravity does not depend upon either its frequency or the amount ejected, but upon its deadly persistence.

IV.—CONSTIPATION.

Cessation in the action of the bowels is a conspicuous feature in peritonitis. The morphine which is often so very freely administered in this affection probably takes some share in the production of this symptom.

In the 100 cases of peritonitis from the London Hospital the bowels are classed as "loose" in 28 instances. In some of these 28 cases there was actual diarrhoea, in others the bowels acted with frequency and without artificial aid, while in a third series of cases a free action was maintained by enemata or by aperients. In 2 cases of peritonitis following hernia in which diarrhoea was met with, it is noteworthy that the peritonitis did not appear until after the diarrhoea had set in, a circumstance which suggests the action of the colon bacillus. In 8 cases of perforative peritonitis associated with a free action of the bowels at the time of the perforation—including 4 cases of typhoid—all passing of motions ceased

in 5 examples when the lesion took place, while in the remaining 3 instances the bowels continued to act just as freely after the peritonitis began. In these three cases the vomiting was much slighter, both in frequency and in amount.

In the 22 cases associated with disease of the appendix, there was constipation in 9 cases (with 4 deaths), diarrhoea in 4 cases (with 1 death), while in the remaining 9 examples the bowels acted naturally or under the influence of enemata; in these 9 cases there was only 1 death. It would appear, therefore, that—other things being equal—a better prognosis attends the cases in which the bowels are acting, and that a specially evil prognosis must be associated with the cases marked by absolute constipation.

V.—LUNG COMPLICATIONS.

In dealing with this feature of peritonitis mere congestion of the lungs and a slight degree of bronchitis have been disregarded.

Among the 100 cases, there were no fewer than 17 in which pleurisy or pneumonia appeared after the peritonitis set in. In the examples of peritonitis of intestinal origin, there were 7 cases, namely, 2 of right pneumonia, 1 of left, 1 of right pleurisy, 1 of left, and 2 of right pneumonia with double pleurisy; 5 out of the 7 cases were in instances of peritonitis associated with hernia or perforation. In the examples of peritonitis starting from the pelvic organs, or from sources outside the abdomen, there were 10 cases, namely, 1 of double pneumonia, 2 of right pleurisy, 5 of left pleurisy, and 2 of double pleurisy. In 6 of the instances the peritonitis had commenced in the pelvis—a notable fact—and in the remaining 4 it was due to a wound of the abdominal wall.

Pneumonia after herniotomy has been supposed to be due to infective thrombi. In two cases of pneumonia associated with gangrenous hernia, Fischer and Levy¹¹ found the colon bacillus and the staphylococcus albus in the hernial sac, and also discovered the same micro-organisms in the pneumonic patches in the lungs. Both patients died with peritonitis, and in the effusion in the abdominal cavity the bacterium coli commune was found.

The nature of the peritoneal exudation appears to have little bearing upon the lung complications, because in the 17 London Hospital cases the peritonitis is described as commencing in 3, as plastic in 3, as sero-purulent in 5, and as purulent in 6.

VI.—FEVER.

The temperature in peritonitis is liable to fluctuations so numerous and extreme that it is difficult, if not impossible, to deduce any type of temperature which may be considered to be characteristic of the disease. Probably there is no affection attended with fever in which the temperature charts of a large series of cases exhibit fewer data for the establishment of a common standard of fever.

Chart 1.—Peritonitis due to Hernia.

A careful examination and analysis of the temperatures recorded in the 100 cases from the London Hospital makes it evident that the one symptom of fever can afford very little guide in estimating the gravity of the case or in forming a dogmatic prognosis. A comparison of the temperature charts

in the cases that recover with those that die leads only to a bewildering result. In some of the fatal cases the temperature has moved steadily upwards, in others it has moved steadily downwards, in the third series of cases an even line of high fever has been followed, while in a fourth set of instances the temperature has been about or below normal. It is quite evident that no marked or regular relation exists between the range of temperature and the character of the peritoneal effusion.

In very general terms it may be said that perforation leads at first to a sudden drop in temperature, and that if the body heat be at the time high the onset of diarrhoea is associated with a more or less rapid diminution of fever. Moreover, it may be remarked that the chart record which carries with it the stamp of an almost inevitably fatal result is that in which the temperature is for consecutive days below normal. The most robust evidences of fever are common in cases in which a plastic peritonitis, or one leading to well-encapsuled pus, is present; while the examples associated with a low range of temperature often mark the cases in which a general sepsis (as from the intestine) is more pronounced than the peritoneal inflammation.

The details of the temperature can best be illustrated by reference to the various forms of peritonitis. In peritonitis due to hernia the temperature is for the most part low and

Chart 2.—Peritonitis due to Hernia.

does not rise in the majority of the cases above 99.5°. (Chart 1 (from the case of a woman, aged 55, in whom a femoral hernia had been strangulated for three days before the operation) is

Chart 3.—Peritonitis due to Perforation.

fairly typical. In the necropsy the bowel was found to be slightly ulcerated. The other viscera were sound. Before death the temperature in these, as in other marked septic cases, usually sinks lower and lower. Occasionally it may spring up to 105 just before death, as shown in Chart 2 (from a case of ventral hernia strangulated two days in a woman of 35. The gut was black, but not perforated). This sudden elevation of temperature has been ascribed by some to a disturbance of the heat-controlling centres by the circulation through them of blood charged with septic matter. In the hernia cases the temperature ran highest (99° to 102° or 103°), in those instances in which the gut reduced into the abdomen was practically gangrenous, or was extensively ulcerated. The onset of diarrhoea led to a fall in the temperature.

In peritonitis due to perforation the temperature in the most rapid cases is that of collapse. If there be an existing high temperature at the time of the perforation it may slowly sink, especially in cases in which the bowels continue to act freely, or may sink for a time and then rise again, as is commonly noticed in examples in which all action of the bowels ceases after the perforation. This is shown in Chart 3 (from a lad of 19, with typhoid fever, and in whom perforation took place on the eighteenth day).

When the perforation is slowly brought about the temperature may rise at first and then sink slowly towards death. Chart 4 shows the four-hour record of fever in the case of a

Chart 4.—Peritonitis after Puncture of the Colon

lad of 18, who was stabbed in the abdomen and in whom, after death, a small puncture in the ascending colon was discovered.

Chart 5.—Peritonitis secondary to Malignant Disease.

In peritonitis attended with gross disease of the intestine the temperature is disposed to rise steadily and then to drop somewhat abruptly before death. With actual gangrene of the bowel a high range of fever is common, and with profuse diarrhoea a lower range. Chart 5 belongs to the case of a woman, aged 49, with a growth in the descending colon and ulceration of the bowel above it (there was no perforation). Peritonitis set in where the chart begins. On the third day a copious diarrhoea began, and its apparent effect upon the temperature shows a common condition.

In peritonitis due to mischief in the appendix the fever is usually high and of the ordinary inflammatory type. Its average range is from 99° to 102° or 103° . Its duration varies greatly, and a lower range of temperature is generally met with in the cases attended by diarrhoea. Chart 6 is from a case of perityphilitis in a man aged 44, in which the earliest symptom was diarrhoea, and in which the bowels were kept open throughout by enemata. Chart No. 7 is from a case of perityphilitis in a youth of 17, who was treated with opium, and in whom there was very marked constipation.

Chart 6.—Peritonitis in Perityphilitis.

Chart 7.—Peritonitis in Perityphilitis.

In peritonitis starting from the pelvis (with which is included puerperal peritonitis), the temperature is rather that of septicæmia. Chart No. 8 has been selected as fairly typical. It belongs to the case of a man, aged 53, who developed peritonitis on the seventh day, after a simple operation for fistula in ano. The trouble began with a rigor. The necropsy revealed a general sero-purulent peritonitis with septic thrombosis of the pelvic veins.

In examples of peritonitis following wound of the abdomen the temperature is for the most part fairly high, running on an average between 99° and 101° to 102° . In 2 cases from the London Hospital series, it remained throughout below

normal. Chart No. 9 is selected as an example of an uncomplicated case following laparotomy. The patient was a woman aged 26. The operation consisted in suturing a hydatid cyst to the abdominal wall. A general plastic peritonitis followed without any visceral complications.

Chart 8.—Peritonitis of Pelvic Origin.

Chart 9.—Plastic Peritonitis after Laparotomy.

REFERENCES.

- ¹ Rullier, *Arch. Gén. de Méd.*, t. ii, 1823, p. 380; Ebstein, *Zeit. f. klin. Med.*, Bd. ix, 1885, p. 209.
- ² See some cases by Lauenstein, *Arch. f. klin. Chir.*, 1892, p. 120.
- ³ *Comptes Rendus*, 1880, p. 1220.
- ⁴ *Journ. de Thérap.*, 1877.
- ⁵ Admirable articles on intestinal neuroses have been published by Stein (*Wien. med. Woch.*, 1892, No. 20), Peyer (*Wien. Klin.*, Jan., 1893), and André (*Gaz. Hebdom.*, 1892, p. 603).
- ⁶ *Deutsch. Zeit. f. Chir.*, 1891, p. 57.
- ⁷ Other experiments are by Talma, Hessel, Karpetschenko, and Schweninger.
- ⁸ *Arch. f. exp. Path. u. Pharm.*, 1887, Bd. xxiii, p. 209.
- ⁹ *Zeit. f. klin. Med.*, Bd. iv, Heft iv, 1882.
- ¹⁰ *Virch. Arch.*, Bd. cxviii, 1889.
- ¹¹ *Arch. f. exp. Path. u. Pharm.*, 1887, Bd. xxiii, p. 209.
- ¹² *Deutsch. Zeit. f. Chir.*, Bd. xxxii, p. 252.

(To be continued.)

THE MEDICAL FACULTY OF BERLIN.—The teaching staff of the Medical Faculty of the University of Berlin consists of 4 honorary professors without stipend, 15 ordinary professors with stipends varying from 4,500 to 8,400 marks (£225 to £428), 14 extraordinary professors with stipends varying from 600 to 3,600 marks (£30 to £180) and a percentage of students' fees; 19 extraordinary professors without stipend, and 68 *Privatdozenten*. Of the latter 17 have the title of Professor; 3 of them were formerly ordinary and 2 extraordinary professors in other Universities. There are also three professors belonging to the Dental Institute, and not belonging to the Medical Faculty; their academic rank seems to be indefinite. There would, therefore, seem to be "professors" of at least five different categories connected with the Medical Faculty of Berlin.