Remarks.—The structure of the tumour furnishes ample explanation of its repeated recurrence, and points to the cause of the difference between cystic tumours of the upper and lower jaw in their tendency to return after stuffing with lint. This treatment can of course lead only to the obliteration of the cavity stuffed, and, while very effectual in curing the disease of the upper jaw, which is, in most cases at least, merely an accumulation of fluid in a single cavity (the antrum) can have little power over proliferous multilocular cysts such as existed in this jaw. I find no notice of this form of disease in the inferior maxilla, either in the ordinary text-books on Surgery, or in Mr Paget’s Surgical Pathology. A knowledge of it must prove of importance in practice, by making us hesitate less to recommend excision of the morbid part in cases where the ordinary treatment has had a fair trial.

The excision of a hard tumour of the lower jaw is generally a pretty easy task, the safety of the operator lying in cutting always towards the tumour. But the extreme thinness of the walls of these cysts made this impossible in the present case, which therefore presented very unusual difficulty in the operation.

The incision from the angle of the mouth is that which Mr Syme always practises for excision of tumours of the lower jaw, having found that the space afforded by the mouth permits the operation to be performed with much greater comfort, while the additional deformity which may be caused by the scar of the incision running into the mouth, instead of near the base of the jaw, is so slight in comparison with the advantage gained, as hardly to deserve consideration.

It fell to my lot to administer the chloroform in these cases. No choking or other unpleasant symptom was caused by its use, while the patients were thereby relieved from no ordinary degree of mental and bodily suffering.

Part Second.

REIEWS.

1. Lettsomian Lectures on Insanity. By Forbes Winslow, M.D., D.C.L. London, 1854. Pp. 160.

2. Practical Observations on Mental and Nervous Disorders. By A. B. Maddock, M.D. London, 1854. Pp. 236.

The first of the treatises before us comprises three Lectures delivered before the “Medical Society of London,” by Dr Forbes Winslow, as Lettsomian Professor of Medicine for the year 1853. Dr Winslow is known to the profession as the author of “The Anatomy of Suicide,” as the editor of the Psychological Journal of Medicine, as the proprietor and physician of a first-class private
asylum in the neighbourhood of London, and as a physician of note in this department of medical practice.

Dr Winslow has selected for his lectures three subjects of vast extent and practical importance; 1. The psychological vocation of the physician; 2. The medical treatment of insanity; and, 3. Medico-legal evidence in cases of insanity. Each of those subjects has already been made the special object of several monograph works, more or less voluminous; and it may therefore be readily imagined that the review of them taken by Dr Winslow in the scope of one lecture devoted to each, can be only either a popular and general one, or one calculated to develop and illustrate some peculiar views of the writer in regard to the more important and debateable points at issue under those several texts.

The first lecture partakes of the former character, and the second and third merit the latter. The object of the first lecture is to impress upon us the importance and dignity of psychological and metaphysical studies,—to show their importance in practical medicine, by illustrating the influence of the mind over the body; and to claim for the cultivators of medical science more exalted and onerous functions than those usually assigned to them;—to consider them in their "spiritual character, as having at their command and under their control a medicina mentis, as well as a medicina corporis—agents of great power and magnitude—which have not been sufficiently recognised or appreciated."

It would, indeed, be difficult to overrate the great importance of those studies to the practical physician, called upon as he is to give counsel and advice in almost every conceivable emergency that may distract the judgment or influence the passions and emotions of those entrusted to his care, or led to seek his advice. To those who intend to make the subject of mental alienation a special study and department of practice, the importance of a profound knowledge of mental philosophy is so obvious, that to us it appears almost a work of supererogation to illustrate it. Yet it is notorious that it is not considered a necessary part of the preliminary education of any medical man that he should have devoted any part of his time to the study of logic and mental philosophy; and that without any study of the phenomena of the healthy manifestations of mind (other than he may pick up in his intercourse with the world) and without any special study of mental derangement at all, he is legally qualified when he receives his degree or diploma, and daily called upon it may be, to exercise the most onerous and responsible duties that can devolve upon one human being in reference to another—those of depriving a fellow-creature of his liberty, of determining his incapacity to manage his affairs, or dispose of his property, and of his responsibility or irresponsibility for acts affecting his life. Our licensing boards render attendance upon lectures on mechanical philosophy and natural history, and a knowledge of Latin and other branches, imperative upon their graduates—the profoundest knowledge of
which *might* in a half century's practice of medicine, never be of essential detriment to a medical practitioner, or his patient; and yet require no preliminary education or special study to prepare their graduates for performing the most responsible duties that can possibly devolve upon them. We do not underrate the importance of mechanical philosophy or any other branch of education, at present embraced in the curriculum of medical education; on the contrary we believe them to be all desirable; but we maintain that some additions might be made to the curriculum of the *preparatory* studies of those devoting themselves to medicine, and that an examination bearing on the subjects of logic and mental philosophy might with propriety be added to the present matriculation examination on Latin only. Add to this a special course of instruction on mental derangement, such as has been already very properly rendered imperative by the Honourable East India Company's Examining Board, and we believe a great boon would be conferred on the medical profession and on the public. We trust that such lectures as the one now before us may have the effect of leading our colleges and other licensing boards to take this subject under their serious consideration.

Under the head of the medical treatment of insanity, Dr Winslow insists very strongly on the curability of the disease, and upon its being a disease of the material organ of the mind. He states it to be the result of his experience, "that if brought within the sphere of medical treatment in the earlier stages, or even within a few months of the attack, insanity, unless the result of severe physical injury to the head, or connected with a peculiar conformation of chest and cranium, and an hereditary diathesis, *is as easily curable as any other form of bodily disease for the treatment of which we apply the resources of our art." This is certainly very cheering, but it contrasts very strongly with an opinion we have heard expressed by one not less eminent in this department of medicine than Dr Winslow,—that he doubted whether any attack of insanity was ever completely recovered from, and whether, even in the cases apparently most rapidly and completely cured, there did not remain some permanent impairment of the mental powers, more or less affecting the intellectual or moral character and activity of the individual in after life. We would gladly adopt the more favourable view of the question, and although we do not for a moment doubt that under early and proper treatment, a very large proportion of recoveries take place, we suspect that it is in a comparatively small number that the cure is as complete, or as little likely to be followed by a relapse, as in many of the bodily diseases we could name.

Dr Winslow's views of the pathology of insanity are brief and comprehensive. "I believe insanity," he says, "to be the result of a specific morbid action of the hemispherical ganglia, ranging from irritation, passive and active congestion, up to positive and unmistakable inflammatory action. This state of the brain may be confined
to one or two of the six layers composing the hemispherical ganglia; but all the layers are generally more or less implicated in conjunction with the tubular fibres passing from the hemispheres through the vesicular neurine." Dr Winslow guards himself against the objection to which his view of the pathology of insanity is exposed by the fact, that according to the statements of the most careful observers there are no positive physical proofs of inflammatory action in the substance of the brain—none of the products of inflammation to be met with in the great majority of cases,—by using the term "specific" as distinguished from "ordinary inflammation." He guards his readers against treating cases of insanity on the ordinary therapeutical rules in cases of inflammation, by depletion and anti-phlogistic measures, and begs them to remember that it is neither ordinary inflammation, nor "mere loss of nervous tone," but specific inflammation or morbid action.

With all respect for Dr Winslow's distinguished abilities as a writer, we must confess that this does appear to us as a darkening of counsel with words without knowledge. We admit that in a very large proportion of post-mortem examinations of those dying insane, morbid changes, indicative of inflammatory action, are found in the membranes of the brain, but we are yet without proof of any constant physical changes in the substance either of the grey or white matter of the brain, to enable us to affirm that there is evidence of a morbid change in its structure sufficient to justify the theory of "a specific morbid action" there. The words irritation, passive and active congestion, are certainly very indefinite; they remind us of Pharaoh's seven lean kine that swallowed up all the fat ones, and seem adapted to comprise every theory of insanity that would ascribe it to a morbid change in the nervous matter which is the immediate organ of thought; but until that morbid change is actually made out by the discovery of its anatomical characters, we think it premature to announce such a pathological creed regarding insanity. It has appeared to us that in many cases of protracted insanity no change in the structure of the cerebral substance itself could be detected, either by the eye or the microscope, to distinguish it from the nervous substance of persons dying in the possession of all their faculties. Dr Winslow takes no account of the theories which ascribe insanity to disease of the blood, and to that which refers it to "loss of nervous tone"—he objects that this loss is due to a "prior morbid condition of the encephalon," the sequel of specific inflammation of the hemispherical ganglia; but of this specific inflammation we contend there is no sufficient evidence, nor, indeed, any at all, in a great majority of cases. We cannot divest our minds of the impression that the analogy between insanity and the effects of certain poisons entering the blood—the suddenness of the invasion of the disease in many cases, and the suddenness of its remission in others, sometimes of long duration, tend to show that it may be a disease of the blood, or may depend upon a condition of the nervous organism which immediately
precedes thought or feeling, and which is not and possibly never

Dr Winslow's remarks on the treatment of insanity are judicious,

We regret that they are necessarily so far condensed in the limits of

The largest and most valuable of the lectures in our opinion is the third, which treats of the medico-legal relations of insanity. It contains a number of valuable hints and advice for the guidance of medical men in giving evidence in courts of law in regard to cases of insanity. It comprises also a very lucid explanation of the law of England in regard to insanity, both as a disqualification for legal acts and as an exculpation from crime.

There is only one point in this lecture on which we are inclined to differ somewhat from Dr Winslow, and that relates to moral insanity. He contends that in all the so-called cases of moral insanity there is a disorder also of the reasoning, intellectual, reflective, or comparing powers; and he asks whether there is not also in such cases a derangement of ideas, and certain latent delusions. While we are ready to admit that, in moral insanity, there are important and essential derangements affecting the will, and the control over the thoughts, volitions, and acts of the individual, and influencing him therefore as a reflecting, reasoning, and responsible agent, we protest against the assertion that, in such cases, actual delusions must exist. This doctrine we conceive to be contrary to the most carefully collated facts regarding such cases, and most dangerous to the best interests of afflicted humanity, however opposed it may be to the legal definitions of insanity; and we do not think it would be serving the interests of truth, out of deference to the opinions of the twelve judges, or any legal distinctions, or precedents, to maintain that the loss of self-control, the inability to control the thoughts, feelings, or actions, is not the true and proper test of insanity rather than the existence of delusion, or the knowledge of right and wrong.

The precautions which Dr Winslow gives as to offering definitions of insanity in a court of law, and the tests which he lays down for the determination of the fact of insanity, are eminently wise and practical. He advises us to compare the man with his former self—not with other men or the world at large—and to ascertain whether his conduct, and ideas, and delusions, are so incompatible with his known natural character as to be referrible only to disease. The same rule appears to us to be applicable to the so-called cases of moral insanity;—if the excited emotions or passions, or perverted feelings, desires, and impulses are obviously such as are altogether contrary to the known character and natural disposition of the individual, they must be regarded as morbid, and as the evidence, therefore, of insanity;—and the definition which Dr Winslow applies to
insanity with delusion is equally applicable to insanity without delusion, the former being delusions which are unmistakeably the product of a diseased intellect, and the latter impulses and desires which are morbid, and the product of diseased feelings, affections, or passions.

Of Dr Maddock’s work on Affections of the Nervous System, we would fain speak favourably, as one containing many judicious and practical observations on the treatment of insanity and allied nervous affections, the result, doubtless, of considerable experience. We cannot, however, avoid taking exception to the character of the work, and of all quasi scientific books of this description, which are neither confessedly popular, or confessedly professional. We charitably hope we may be wrong, but we cannot help a feeling, that a book which commences with a popular description of temperament, poetically illustrated, followed by a description of the nervous system, in which we are considerately made acquainted with the fact, that the medulla oblongata is a small, but important appendage, “lying directly at the bottom or basis of the entire mass of the brain material,” is intended rather for the general public than the profession; and that a work which consists in a great measure of “cases” considered “hopeless” and “incurable” at Bethlem and elsewhere, and which are speedily cured by the author, under protestation that this case will be remembered by Dr H. of ——, and the other is well known to Mr —— of ——, savours very strongly of the advertisements of Morrison’s Pills and Holloway’s Ointment, which figure in every provincial newspaper. We regret that a writer who can adorn his work with so many quotations from Horace, Shakespeare, and Milton, and so many references to medical men of high standing in the department of his profession, should appear to prostitute his talents and experience in the production of a treatise which looks to us very like a large advertisement for consulting practice.

1. On some Diseases of Women admitting of Surgical Treatment. By I. B. Brown, F.R.C.S., etc. London: 1854. 8vo. Pp. 288.
2. On Uterine Polypus: its Nature, Early Detection, and Treatment. By R. Barnes, M.D. London: 1854. Small 8vo. Pp. 44.

In the volume before us we have an exposition of the surgical treatment applicable to many of the most common and serious affections of the female generative organs. It is by one of the surgeons of St Mary’s Hospital, a lecturer on obstetrics in a young educational establishment connected with that hospital, and a gentleman well known to the profession as having taken an especial and active interest in this department of the medical art. The subjects discussed are among the most difficult in the whole field of surgery, rupture of the perineum, prolapsus of the uterus, vesico-vaginal and recto-vaginal fistula, polypus, stone, imperforate hymen, ovarian
dropsy, etc., etc. From the work is excluded all the minor surgery of diseases of the cervix uteri and vagina, subjects which the profession will willingly allow to rest for cool consideration after having been so recently and extensively discussed, not to say perplexed.

The most important part of the work is that devoted to the consideration of the restoration of the perineum, the recto-vaginal and vesico-vaginal septa. It is well known that the vesico-vaginal deficiency is by far the most important, and for two reasons; namely, first, that it causes more suffering and distress than the others, suffering equal to that produced by any other affection; and, secondly, that it is one of the most difficult to cure, the difficulty in practice often amounting almost, if not altogether, to an impossibility. This piece of plastic surgery offers full scope for ingenuity in device and dexterity in achievement to the best and ablest surgeons, and probably for a long time to come will offer. It would be vain, in our present position, to speak decidedly on the merits of the various proposals for closing up a vesico-vaginal fistula. The last author in the field has always a new plan, great confidence and moderate success. Before Mr Brown a very able and distinguished Parisian surgeon, M. Jobert, published a treatise on these fistulae. His plan of treatment has been described briefly in former numbers of this Journal, and we have had the pleasure of seeing cases of his where they proved wonderfully successful. Every workman likes his own tools and ways. Mr Brown, of course, recommends his own, and we find he adopts the ingenious so-called clamp suture of Dr Marion Sims of Alabama, a gentleman, the supposed neglect of whom has very nearly turned the head of some contributor to our monthly contemporary in America.

For book-making purposes surgeons have displayed wonderful ingenuity in describing new operations—and nowhere is this peculiarity more prominent than in regard to this affection. It requires a very critical eye to discover the differences among the "new operations." They all come to this—you thoroughly pare the edges—you bring them together and keep them there by various sutures the best way you can—you take off all strain on these sutures as far as possible—and you keep all as quiet as possible not to disturb the parts and so stop the process of union. It is not to be supposed, however, that the small differences alluded to are always unimportant though they may often be so. Mr Brown's plans have the merit of simplicity, and well deserve the consideration of any one who purposes operating. He has had an average amount of success. The first case he records, failed; in the second, after treatment, no fistulous opening could be found; the third died about sixteen days after the operation: the fourth failed.

"These cases," says Mr Brown, "illustrate the various points of difficulty which are met with in the treatment of this distressing lesion; and although they do not exhibit a great amount of success, they may fairly be looked upon as valuable illustrations of our present knowledge and practice; and I still
look forward to a greater amount of success, by steady observation and per-
severing efforts, which the late improvements in surgical science certainly
justify; especially as the difficulties are rather mechanical than pathological.
It cannot be concealed, however, that it requires no ordinary amount of per-
severance and determination, to bear up under the vexatious disappointments
which are constantly occurring in the hands of the most painstaking opera-
tors."—P. 111.

Mr. Brown enters at length into the subject of lacerated peri-
neum. We cannot now follow him through this elaborate essay.
He recommends the division of the sphincter ani on both sides to
remove strain upon the sutures inserted; he approves of operating
immediately after the injury; and advises the copious use of opiates
to constipate the bowels as an important part of the after treatment.
In other respects there is little novelty. Much is made of the mode
of incising and preparing the surfaces to be united, but it all comes
in the end to the simple making a raw and uniting the denuded parts.
We cannot approve of the drawing (plate 1) of the proposed sections.
It bears more resemblance to a field work or fortification than to
any incisions ever made in restoring the integrity of the perineum.

The chapter in Mr. Brown's work on polypus is meagre and in-
complete. But the profession has in its place a little book on this
subject from the pen of Dr. Barnes, which contains an excellent
account of this disease, and ably discusses the novel points in its
pathology and treatment.

One of the best and soundest parts of Mr. Brown's volume is the
twelfth chapter, on diseases of the rectum resulting from certain
conditions of the uterus.

"Displacement forwards or backwards, and enlargement of the uterus, from
whatever cause,—whether pregnancy, hypertrophy, inflammatory energe-
ment, distension by fluid or by hydatids, polypi, or scirrhus, or any other dis-
ease—alike tend to injuriously affect the rectum.

"As displacement may occur without enlargement of the uterus, it may
operate singly in inducing rectal disease; but more often the two conditions
concur, and it is then chiefly that the mischief is so considerable. The evils,
too, will be greater when, with retroversion, engorgement of the body of the
uterus, and with anteverision, that of its neck, go together. On the other hand,
enlargement, without deviation of the womb forwards or backwards, may, and
oftener does, act singly in provoking disease of the rectum, than either of these
displacements does without it.

"The conditions of the uterus under consideration act on the rectum injuri-
osely in two ways: first, by mechanical pressure; and, second, by inducing
vascular disturbance like that present in themselves. An enlarged uterus
drags on its lateral ligaments, elongates them, subsides lower down in the pelvis,
and so comes to press on the lower bowel, to interfere with its muscular action
and the circulation through its bloodvessels, and to irritate its mucous lining.
At the same time any hyperæmic state of the uterine vessels causes an in-
creased fulness of the hemorrhoidal, and a determination of blood to them.
Thus, by reflecting on the anatomy of the parts, it will easily be understood
why and how diseases of the rectum, such as hemorrhoids, prolapsus, fissure,
stricture, fistula, as well as disordered functions of the bowel, as constipation,
dysenteric irritation, etc., do sometimes result directly, either from the
mechanical pressure of an enlarged uterus, or simply from the derangement of
the hemorrhoidal circulation, resulting from uterine disease."—P. 148.

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These views of our author find their natural counterpart in the marked success attendant on their being carried out in practice. None of the cases in this work are more interesting and instructive than those in this chapter. We shall quote one as an illustration of the rational and successful treatment of uterine displacement.

"Case XLI.—L. C., aged 31, unmarried; had suffered for several years from three or four large piles, which, she stated, protruded in the act of walking, and also created great uneasiness in the sitting posture. Every three or four weeks she lost a considerable quantity of blood from them. Her bowels were seldom opened more than once in three or four days, and then only from taking some aperient. After each defaecation, she had always increased inconvenience and pain. She suffered much from indigestion, headaches, and general lassitude. I first inquired as to the menstrual function, and found that, although she was generally regular every four weeks, the quantity was very small, and the discharge seldom continued more than one day, and that, at this time, she generally lost a considerable quantity of blood from the hæmorrhoids.

On making a digital examination per vaginam, I found the uterus enlarged and painful to touch, and lower in the vagina than normal. I directed that three leeches should be applied to the os uteri, and that the bleeding should be encouraged by a hip-bath immediately on their removal; that the bowels should be freely opened by a saline aperient; and that this treatment should be pursued once a week. She was further directed to take twice a day the sixteenth part of a grain of the bichloride of mercury, and her diet was ordered to be simple, nutritious, and unstimulating. The result of these measures was, that at the next menstrual epoch there was a more copious uterine discharge, and an absence of bleeding from the hæmorrhoidal vessels. The same treatment was continued for another month, and resulted in an improvement in menstruation, both in quantity, and in the duration of its flow; the uterus had much decreased, being nearly of its normal size, and not painful to touch. I now considered it advisable to remove the hæmorrhoids, which I did by passing a ligature of twine round the base of each. I then placed the patient in bed, giving her a grain of opium every four or six hours, for the purpose not only of affording relief from pain, but also of constipating the bowels till the ligatures should come away, which they did in five or six days. The case progressed satisfactorily and the patient returned to the country perfectly recovered.

"This case presents some striking practical facts, which will serve to illustrate my preliminary remarks.

1. The bleeding from the hæmorrhoids at the menstrual epoch. It is a fact that hæmorrhoids are always more troublesome at the time of menstruation, because more blood is circulating through the bloodvessels of the rectum as well as of the uterus; and, if there be any obstruction in the uterine vessels to prevent the menstrual flux, then the hæmorrhoids often bleed freely.

2. The enlarged and inflamed uterus, with the absence of the menstrual flux.

3. The great relief afforded by the antiphlogistic treatment.

4. In ligaturing the hæmorrhoids I prefer twine. Its advantages over silk are very marked:—first, in procuring a quicker separation of the tumour; and, secondly, in causing less pain to the patient. It will also be observed, that I preferred the ligature to the scissors in the removal of these tumours, acting upon the golden rule laid down by my old and esteemed friend, Mr Copeland, in all operations upon the rectum, 'to cut skin, and tie mucous membrane.' I am also indebted to the same gentleman for the practical hint to prefer the use of the vegetable product—twine, to that of the animal product—silk.

"I think it is not too much to assert, that had I at first devoted my attention to the hæmorrhoids in this case, I should not have succeeded in restoring my patient to the condition of health."—Pp. 150, 151.

The chapter on ovarian dropsy is very well worthy of perusal.
although the great difficulty of the subject is avoided, namely, the question whether ovariotomy should or should not be performed. The discussion of this very important point would lead us beyond the limits assigned to the present notice.

We can recommend Mr Brown's volume to the profession as the best treatise in our language on the diseases of females admitting of surgical treatment.

**Principles of Comparative Physiology.** By William B. Carpenter, M.D., F.R.S., etc. Fourth Edition. Lond. 8vo. 1854. Pp. 770.

The third edition of Dr Carpenter's Principles of Physiology, General and Comparative, is exhausted,—a circumstance which excites no surprise in our mind, as we have always considered it to be the best work he has produced. That book was exactly three inches thick; and in preparing a fourth edition it was found that there was still more to add, which would have swollen its already bulky proportions into literally an insupportable size. But instead of dividing the entire treatise into two volumes, as suggested to him by many of his friends, the author has preferred to divide its subjects, and to treat of them separately, though connectedly. The present volume, therefore, consists of the "Comparative Physiology" of the last edition, extended from 530 pages to 744, and with 300 illustrations instead of 130.

On the merits of the work we need not dwell, as every anatomist, zoologist, and physiologist will readily admit that it is the best exposition of the present state of comparative physiology in the English language.

**Histoire Naturelle des Végétaux Parasites qui croissent sur l'Homme et sur les Animaux Vivants.** Par Charles Robin, etc.

**Natural History of the Parasitic Vegetations which grow on Man and Living Animals.** By Charles Robin, M.D., Professor of General Anatomy, etc. etc. With an Atlas of Fifteen Plates, partly coloured. Paris. 8vo. 1853. Pp. 702.

Press of matter has obliged us to delay our analysis of this important work so long, that we fear another edition will appear before we shall be in a condition to do so. We therefore now make our acknowledgments to M. Robin for his valuable book. It was a long time before our elder pathologists could be made to believe that scald head, the diptherite of infants, and other, to them, well known diseases, were in truth owing to the growth of fungi on the living tissues. But so it is; and the idea once admitted, the reader has only to look into M. Robin's volume, and he will be surprised at the enormous development which it has already undergone. At present this work is justly considered as the standard authority on the subject, containing as it does the most accurate description and figures of every known parasitic plant growing on living animals.
THE OBJECT AND ORDER OF MEDICAL STUDIES.

In the above table we have given medical students a correct list of the various teachers in the schools of Edinburgh, Glasgow, Aberdeen, and St Andrews. In now addressing to them a few words of advice, there are many subjects to which we might direct their attention, such as the necessity of those habits of diligence and regularity which are so necessary for the perfect attainment of any art or science; the importance of the profession of medicine in its
### SESSION.

| Surgery    | Midwifery   | Natural Philosophy | Natural History | General Pathology | Clinical Medicine | Clinical Surgery |
|------------|-------------|--------------------|-----------------|-------------------|-------------------|-----------------|
| Prof. Miller | Dr Simpson  | Professor Forbes   | Professor E. Forbes | Dr Henderson  | Drs Alison, Christison, & Bennett. | Professor Syne. |
| Mr Spence  |             | Dr Lees.           |                 |                   |                   | Dr Dunsmure.    |
| Dr Lawrie  | Dr Pagan    | Prof. W. Thomson.  | Dr Wm. Couper.  |                   | Dr Robertson.     | Dr Easton.†    |
| Dr Hunter  | Dr Paterson | Professor Gray.    | Professor Nicol. |                   |                   | Dr Bell.†      |
| Prof. Pirrie | Dr Dyce.    | Professor Thomson. |                 |                   |                   | Dr Kilgour.    |
| Dr Kerr    | Dr Rainy    | Professor Fischer. |                 |                   |                   | Dr Keith.      |

| Botany      | Medical Jurisprudence | Natural Philosophy | Natural History | Clinical Medicine | Clinical Surgery |
|-------------|-----------------------|--------------------|-----------------|-------------------|-----------------|
| Dr Balfour  | Dr Traill             | Professor E. Forbes |                 | Drs Alison and Bennett. || Prof. Syme. |
| Dr W. Arnott | Dr Haldane           | Dr Lees.           |                 | Dr Robertson.     | Dr Dunsmure.    |
| Dr Bell     | Dr Rainy.             |                   |                 |                   | Dr Easton.†    |
| Dr Crawford |                       | Dr Bell.†          |                 | Dr Hunter.†      |
| Prof. Nicol | Dr Ogston.            |                   |                 | Dr Fleming.†     |
| Rev. T. C. Brown | Dr Reid.       | Rev. Mr Longmuir. |                 | Dr Kilgour.    |
|             |                       |                    |                 | Dr Keith.      |

Land their functions are only to assist in the practical anatomy classes, and they are not authorized on anatomy and physiology.

In the English schools. The London Boards, however, consider two courses of anatomy with three courses each of anatomy and of general anatomy and physiology, in England. Special always be inquired for.

*†* This is a joint course.

Practical, social, or political bearings; the advantage of keeping alive that enthusiasm, and those high aspirations which constitute in youth the chief stimulus to exertion; the consideration that our days of studentship constitute the most important epoch in our lives; and the caution required by the conviction that, for the most part, it is then our future character as men of honour, truthfulness, and probity is formed. Hoping that all these topics will receive mature consideration, we shall content ourselves with pointing out what we believe to be the true object and order of medical studies.
We are induced to do so in consequence of having observed too many instances where an ill regulated education, a confusion in the plan of proceeding, and an unacquaintance with what is essential and what is non-essential, has tended to retard and even to ruin the career of several young men who were otherwise distinguished for considerable aptitude and ability.

In the outset, then, we would especially endeavour to impress upon those we now address, one important fact, namely, that they are medical students, and that as such their ultimate object is to acquire an art, or, in other words, a knowledge of all those means which are directed to the prolongation of life and cure of diseases. It is not for them to become natural or moral philosophers, chemists, histologists, zoologists, or botanists, although these subjects, if wisely studied, will, by inducing habits of exact observation and sound reasoning, be of the most essential service to them as medical practitioners. Neither is it for them to attempt the acquisition of all the knowledge that the different professors they attend, teach in their particular departments. But what is expected of them, and what they must endeavour to obtain from the whole series of studies, is such a sum of learning and such an available kind of information, that they may undertake the serious duties of a medical practitioner with credit to themselves and advantage to the public. This is the great object which should never be lost sight of, from the beginning to the end of their medical studies.

No general observations are applicable to every individual, and he who proposes spending a portion of his student life in the Scottish schools, will find no difficulty in following any of the classes he may find necessary. In Scotland, a young man generally commences his medical education at the age of 17 or 18 years, and spends four years in the acquisition of professional knowledge. It is to him, and in reference to the proper employment of these four years—a time short enough for the object in view—that the following remarks are more particularly addressed.

The first duty which every medical student should perform, is to draw out a well considered plan of the order in which he is to study the various subjects contained in the prescribed curriculum—the hours necessary for attendance on classes and the time at his disposal for other pursuits. This general plan, if a good one, ought to be carefully followed, although it may receive a few modifications, additions, or subtractions as time advances, with the view of meeting particular wants or requirements in individual cases. What is especially necessary to be understood is that a thorough knowledge of some things is essential, whilst only a general knowledge of others is expected. The first essential subject to be acquired is Anatomy. This truth, which is sure to force itself upon the student sooner or later, is unfortunately one which often fails to impress itself upon him at that time when most likely to be useful. Anatomy, indeed, is, as it were, the alphabet of his subject; it is the *sine qua non*, without
which all other kinds of study are perfectly useless. Medical, like most other forms of education, consists of a series of steps, each of which must be mounted before it is possible to reach the other. There can be no leaping over in this case. Hence it is necessary to be convinced that the more earnestly Anatomy is cultivated during the first year by means of lectures, demonstrations, reading, but above all by dissections, the more thoroughly will the student be prepared for, and the more easy will become his subsequent studies.

Another important subject is chemistry, which teaches a knowledge of the elementary composition of bodies, and of the method in which combination takes place between them. Indeed as Medicine progresses, the more it becomes evident that Chemistry, particularly organic chemistry, must play a chief part in causing its advancement. Those who may feel ambitious of assisting in this great work, should pay marked attention to a science, on the development of which physiology and scientific medicine are greatly dependent.

Both Anatomy and Chemistry should be studied during the first winter session, and it will be well for the student to attend with them a course of Natural Philosophy. Of the three subjects, Anatomy should be considered as the chief one, and every thing else should give way to it. There will be ample time, however, for the study of chemistry, while by attentively following the lectures on Natural Philosophy, with only occasional reference to books, a sufficiency of that subject may be acquired.

The summer should be principally devoted to the furtherance of Anatomical knowledge by means of dissections, and by studious attention to the demonstrations and the course of comparative anatomy. Practical Chemistry should be followed in the laboratory. Either Natural History or Botany should also be attended, care being taken that neither of these agreeable studies interferes with that all-important subject, Anatomy, which, during these three months, should be strenuously and energetically pursued, in order that preparation be made for the next great step in medical education.

There seems to be a principle in the human mind which seeks for a rational causation, or an explanation of the phenomena it observes; and hitherto we have supposed the student to have been busied with anatomical and chemical facts. He has next to ascertain the theory or generalisations which are derivable from them. This constitutes the course of the Institutes, which comprises a systematic consideration of histology, physiology, and some parts of pathology. We need not dwell upon the necessity of theory, for the mind, and especially the young one, is only too prone to rush into it. It is not so much theory itself, as correct theory—that is, one which embraces all known facts—that is so much to be desired. Indeed nothing is more necessary than early to acquire the habit of checking rash speculation, and that proneness to crude and imperfect hypothesis, which alike characterises the infancy of knowledge in the
early history of the world, as well as in the early history of each individual. One of the most certain modes of accomplishing this is rigidly to separate fact from theory, to do which accurately in the ever advancing state of knowledge is much more difficult than the tyro may at first sight suppose. A fact may be defined, as that which is obvious to the well cultivated senses of the observer. We say well cultivated, because the senses themselves require to be educated before they can receive proper impressions. Here indeed lies the difficulty, for what is obvious to the sight of an experienced observer is overlooked by the student; the sound which is heard by the one is inaudible to the other; what the first feels distinctly is not tangible to the second. The acquirement of facts therefore must be commensurate with a proper cultivation of the senses, whilst a correct theory will depend upon combining this with just reasoning power and strength of mind. Both of these essential parts of education require constant practice, and hence it is that personal investigation (as in dissection) is necessary for the one, whilst severe thought, revolving mentally reasons for and against, and, above all, discussion with others are so essential for the other. Those who take every thing upon trust—who do not look, hear, or feel for themselves can never be good observers, and their range of facts is limited—while such as do not think or reason, however acute they may be in observation, can never make any real progress in scientific study.

With regard to improving the mental powers and that critical acumen so necessary for separating truth from falsehood, there is one method which we have no hesitation in strongly recommending to the student. We allude to the benefits to be derived from constant attendance on a well conducted debating society. Of all such institutions the Royal Medical Society of Edinburgh may be considered as a model of excellence, and it is one of which the students of that University have justly been proud, for the long period of 120 years. Similar societies, we believe, exist in Glasgow and Aberdeen. These institutions conjoin the advantages of an excellent library and reading room; an intercourse with the most industrious and intelligent students; an introduction to the mode of conducting public meetings and discussions; the means of obtaining fluency of speech and perspicuity of language; an opportunity of concentrating one's knowledge on those points which are the subject of discussion; of bringing forward in the form of a communication the results of individual reading, observation, or research, and above all, they animate to that legitimate and honourable endeavour to obtain distinction, which is itself a strong proof of existing excellence, and the best stimulus to future exertion.

But to return to our plan of education. Whilst during the second year every effort should be made to arrive at powers of generalisation, the student must hold fast and extend his knowledge of facts, and hence during this period he again attends the class of anatomy, and continues his dissections. Now also his
knowledge of facts will commence to take a new direction, as he must attend lectures on Materia Medica and Therapeutics, whereby a knowledge of the action of drugs, and other remedies, is to be acquired. He must further attend systematic surgery, and so obtain a general notion of external diseases. In doing so he will observe how necessarily operations on the body are connected with a knowledge of anatomy, and this study having been hitherto general ought now to be directed by a surgical aim. Thus every thing depends upon the manner the first year has been spent, for if anatomy be wanting, surgical details cannot be understood, and the result will be that instead of the attention being concentrated chiefly on the study of physiology, and obtaining just views of function, the mind will be perplexed, an attempt will be made now to learn the facts that ought to have been already mastered, the ideas of theory will be vague and confused, and at the end of the session, instead of being ready to take advantage of the summer three months, it will be necessary to pause, or even to retrograde, in the prescribed course.

During the second summer Botany or Natural History should be attended; and, in doing so, the student should resolve on making himself master, at this time, of as much of either of these sciences as he can. Here, again, if he has made himself tolerably proficient with the general laws of physiology, in the course of the previous session, he will readily perceive how either subject bears upon his general course of study. Whilst attending botany or natural history he should assiduously extract from the lectures, all the facts and sound theory he can, and add them to his store of knowledge, placing them, with natural philosophy, amongst the useful but non-essential parts of study. During this summer, also, he should commence, if he have not previously done so, attendance on the hospital, enter to a course of practical pharmacy, once more pursue practical or analytical chemistry in the laboratory; and, if he can, occupy some hours in dissection, of which it is impossible to have too much, as thereby he will keep up his knowledge of anatomy.

We now arrive at the third year in Medical Education, and at what may be called the third essential step in the student's onward progress. It consists in directing his chief attention to hospital practice. Many Scotch students, indeed, first enter an hospital at this time, but we cannot too urgently advise them to take out a perpetual ticket for hospital attendance at the commencement of their studies. Not that during the first two years the tyro should make it a principal subject of attention, but that he may have the right of entering the wards, of habituating himself to the sight of disease, of seeing important operations, and so gradually and insensibly prepar-

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1 It is a matter of no importance whether botany or natural history be attended first, but it is of great consequence to the comfort and general advantage of the student that they be not studied at the same time.

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ing himself for the future. It is at the commencement of the third year, however, that hospital study should assume the chief place in his system of education, and he will be wise never to let it afterwards hold an inferior position. His object in attending an hospital should be, while perfecting himself in observation, while extending his knowledge of facts, and connecting them with the principles he has acquired, to obtain what is called experience and practical tact, a kind of knowledge that cannot be obtained from books or lectures, and is only to be acquired at the bed-side. Its value cannot be too highly estimated, because, as the theory or science of medicine is imperfect, its shortcomings and redundancies can only be remedied by continual observation and experiment, such as the wards of an hospital present us with. Now, therefore, the student should commence the serious study of disease, at first in the surgical wards, where it is external, and directly presented to the sight, or the other senses; and, secondly, in the medical wards, where it is internal, and more a matter of inference and correct reasoning. This latter is generally done in the fourth year. But whilst engaged in acquiring experience, the knowledge of facts and theory should be kept up and extended. Many will further be obliged to follow a second course of systematic surgery, and this should constitute now the chief subject of study, especially as clinical surgery, and carefully watching surgical cases in the hospital are also essential. In addition, a systematic course of the Practice of Physic should now be attended, without, however, at this time, doing more than deriving from it a general knowledge of internal diseases. In short, during this third year, the student should take care and add to his previous knowledge a good acquaintance with Surgery and the Materia Medica.

During the third summer session, the student should pay attention to Dispensary practice, continue his attendance on the hospital wards, surgical or medical, according to the nature of his requirements, and attend one or more of those special classes which are delivered in every great school of medicine. The fourth and last year should be entirely devoted to practical studies, the chief being Practice of Physic, Clinical Medicine, and Midwifery, with careful observation of cases in the medical wards. In summer, the course of Medical Jurisprudence must be followed. The student should also again attend the Dispensary, treat cases for himself, under the eye of a good practitioner, and pay attention to Practical Midwifery. During all this time, while extending his powers of observation and his experience, theory should be advanced to its farthest limits by the acquirement of a true pathology. At this time, one of the most important subjects to attend to is morbid anatomy, as studied at post-mortem examinations. For, if descriptive anatomy be useful as surgeons, morbid anatomy and general pathology are infinitely more useful as physicians. Indeed, considering how few operations any one student may have to perform, while every practitioner, whatever be the sphere of his practice, has
to treat alterations in the structure of various tissues and organs, the importance of morbid anatomy cannot be too strongly urged. Moreover, there are few medical men, who are not occasionally called upon to open a dead body, and report upon the morbid appearances observed in reference to some legal investigation. His power of accomplishing this duty well, will entirely depend upon his previous experience in morbid anatomy; on having seen many well conducted post-mortem examinations, and on having carefully handled and examined the diseased parts. Not only may his reputation among his fellow-citizens be gravely affected by his conduct on such an occasion, but the vindication of innocence or the detection of guilt, the lives of the accused, and the satisfactory accomplishment of numerous judicial inquiries, may hang upon his correct judgment. How culpable, therefore, the man who, knowing his future responsibilities in these things, habitually neglects the post-mortem examinations of a large hospital!

In addition to those branches of instruction which are considered imperative, some students will further avail themselves of special classes, according as their time and means allow, and in pursuance of the particular direction in which they intend to practise. Thus, in most of the large schools of medicine throughout Europe, there will be found extra means of becoming practically acquainted with comparative anatomy, histology, operative surgery, analytical chemistry, ophthalmology, stethoscopy, pathological anatomy, insanity in a well-conducted asylum, etc., etc.; and such special courses are calculated to give a greater impulse to individual study, and render it more perfect than may at first sight be imagined.

In the sketch of medical education now given, it has been our endeavour to point out, that there are three essential parts,—1st, facts; 2d, theory; and, 3d, experience. It is by the combination of these three divisions of knowledge—by an appreciation of the advantages to be derived from each—by correcting the faults inherent in one by proper application of the others, that the student may be expected at length to obtain just views of the science and art of medicine. He will, we trust, also see the importance of studying these three divisions in their proper order. Indeed, on this point there can be no difference of opinion, as every body must learn in this way, and no other. For if any one attempt to master theory without an acquaintance with facts, or endeavour to profit by experience without any general notions of health or disease, we need scarcely say, that very gross ignorance must be the result. Indeed, it is to the imperfect education, arising from undue attention to one or more of these subjects, from a limited acquaintance with facts, or from a too theoretical disposition uncontrolled by experience, that we may ascribe the ridiculous doctrines which have originated among ignorant practitioners, and been spread amongst a still more ignorant and credulous public. To the student, order and method at the
commencement will save him time and labour. However hard and
dry the toil at first, in the end he is sure to be rewarded by the con-
sciousness of time well spent and labour properly directed. How
often have we seen a student, in his fourth and last year, instead of
zealously deriving benefit from hospital attendance, and feeling in-
terested in the post-mortem examinations, deserting the wards and
pathological theatre, in order to follow some elementary course of
anatomy, or of chemistry. He feels convinced too late, that what
must be done, had better have been accomplished long before, and
that, in order to acquire elementary knowledge, he is under the ne-
cessity of sacrificing that precious experience, which he may never
again have the opportunity of obtaining. We trust the observa-
tions now made, will at least guard our young friends from this
danger, and impress upon them the importance of acquiring, in their
proper time and order, elementary facts, correct theory, and personal
experience. We would say to them—determine from the first to
employ your faculties honestly in the acquirement of sound instruc-
tion. Let your aim be directed to a thorough knowledge of your
responsible profession, and you will have nothing to fear from exa-
minations. Above all, avoid those attempts to burden the memory,
and those artificial systems of acquiring a parrot-like information,
into which the base and interested endeavour to entrap the unwary.

A mind so educated and regulated will not be likely to go astray,
and its possessor, while alive to the necessity of following the progress
of the science and art of medicine, will in this manner best learn,
amidst the multitude of suggestions, the number of theories and the
opposing statements that may perplex him, to reject what is worth-
less, and only adopt what is truly useful. He will despise the
miserable vanity of announcing what is new, without a scrupulous
regard to its being correct. He will, while retaining the right of
thinking boldly for himself, not forget that observation is difficult,
theory imperfect, and experience fallacious. He will not, therefore,
rashly substitute his own authority for that of those whose knowledge
is more extensive, or commit himself to the ephemeral doctrines of
the day, by which a few otherwise respectable men have lost their
professional reputation. He will remember, that the conclusions of
youth are almost always modified by the experience of age, and that
the wisest and most eminent men of science have given the best proofs
of a solid understanding, by the readiness with which they have ac-
knowledged their own ignorance.

In conclusion we have again to repeat, that the order of medical
study we have recommended, seems to us the best applicable for the
student in Scotland, who dedicates four years to the acquirement of
sound professional knowledge. But where the time allowed is ne-
cessarily shorter, or when it is important to pass the examination of
a special board which has issued imperative regulations as to the
order, as well as the subjects of study, care must be taken to modify
it accordingly.
## Course of Study Required by the Various Boards of the United Kingdom

| Board                                      | Years | Mons | Mos | Mos | Mos | Mos | Mos | Mos | Mos | Mos | Mos | Mos | Mons | Mons | Mons | Mons | Mons | Mons | Mons | Mons | Mons | Mons | Mons | Mons |
|--------------------------------------------|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| Edinburgh University, M.D.                 | 21    | 6    | 6   | 6   | 6   | 6   | 6   | 3   | 3   | 6   | 6   | 3   | 3   | 6    | 6    | 3    | 2    | 24   | 24   | 24   | 24   |
| University of Glasgow                      | 21    | 12   | 6   | 6   | 6   | 6   | 6   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 24   | 24   | 24   | 24   |
| University of Aberdeen                     | 21    | 12   | 6   | 6   | 6   | 6   | 6   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 24   | 24   | 24   | 24   |
| University of St Andrews                   | 19    | 6    | 6   | 6   | 6   | 6   | 6   | 1 ers | 1 ers | 1 ers | 1 ers | 6    | 1 ers | 12   | 12   | 12   | 12   | 12   | 12    |
| London University M.B., 1st, 2d            | 21    | 6    | 6   | 6   | 6   | 6   | 6   | 3 ms | 3 ms | 3 ms | 3 ms | 3    | 9    |
| Dublin University M.B.                     | 18    | 18   | 18  | 18  | 18  | 18  | 18  | 3   | 6   | 6   | 6   | 6   | 27   | 27   | 27   | 27   |
| "" Surgical Diploma                        | 21    | 6    | 6   | 6   | 6   | 6   | 6   | 3 mos | 6    | 6   | 6   | 6   | 18   | 18   | 18   | 18   |
| "" The Queen's Univer. of Ireland, 1st, 2d | 21    | 6    | 6   | 6   | 6   | 6   | 6   | 3   | 6   | 6   | 6   | 6    | 3    |
| Royal Col. of Physicians, Edinburgh        | 26    | 6    | 6   | 6   | 6   | 6   | 6   | 3   | 3   | 6   | 3   | 3    | 6    | 36   | 36   | 36   | 36   |
| Royal Col. of Physicians, London           | 26    | 6    | 6   | 6   | 6   | 6   | 6   | 3   | 3   | 6   | 3   | 3    | 6    | 36   | 36   | 36   | 36   |
| Royal Col. of Surgeons, Edinburgh          | 12    | 6    | 12  | 12  | 12  | 12  | 12  | 3   | 3   | 3   | 3   | 3    | 3    | 27   | 27   | 27   | 27   |
| Royal Col. of Surgeons, London             | 21    | 18   | 18  | 18  | 18  | 12  | 12  | 3   | 3   | 3   | 3   | 3    |
| Royal Col. of Surgeons, Dublin             | 18    | 18   | 18  | 18  | 18  | 18  | 18  | 3   | 3   | 3   | 3   | 3    |
| Apothecaries' Hall, England,                | 21    | 12   | 12  | 12  | 12  | 12  | 12  | 3   | 3   | 3   | 3   | 3    | 3 mos | 18   | 18   | 18   | 18   |
| Army Medical Board                          | 21-25 | 24   | 12  | 12  | 12  | 12  | 12  | 6   | 6   | 3   | 3   | 3    | 3 mos | 18   | 18   | 18   | 18   |
| Navy Medical Board                          | 20-26 | 12   | 12  | 12  | 12  | 12  | 12  | 3   | 3   | 6   | 3   | 3    | 6    | 18   | 18   | 18   | 18   |
| E. I. Company Medical Service              | 22-28 | 12   | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12    |

Information respecting exceptions to these regulations under various circumstances, and other details as to the order in which, according to some Licensing Bodies, the courses should be taken out, etc., must be obtained by consulting the published Charts of the Colleges, etc.
To render this number truly useful to the student, we give three other tables. 1st. The variable kinds of study which, to the great injury of medical education in Great Britain, are put forth by different licensing boards. 2d. A maximum plan of medical education for a student who dedicates four years to the study, has ample means, and desires to obtain first-class honours. 3d. A minimum plan of medical education for a student who can only dedicate three years to the study, and who only wishes to pass the College of Surgeons. Both these plans of study are mere general guides, admitting of considerable deductions, additions, and modifications.

PLAN OF MAXIMUM COURSE OF STUDY, OCCUPying FOUR YEARS.

FIRST YEAR.

| Winter              | Summer                  |
|---------------------|-------------------------|
| Chemistry.          | Botany, or Natural History. |
| Natural Philosophy. | Practical Chemistry.    |
| Anatomy.            | Dissections.            |
| Dissections.        | Comparative Anatomy.    |
| Anatomical Demonstrations. | Anatomical Demonstrations. |

SECOND YEAR.

| Materia Medica.    | Natural History, or Botany. |
| Surgery.           | Dissections.                |
| Dissections.       | Anatomical Demonstrations.  |
| Anatomy.           | Practical Chemistry.        |
| Institutes.        | Practical Pharmacy.         |
| Anatomical Demonstrations. | Hospital Attendance.         |
| Hospital Attendance. |                          |

THIRD YEAR.

| Surgery.    | Histology, Ophthalmology, or other special classes. |
| Materia Medica (if necessary). | Hospital Attendance. |
| Institutes (if necessary). | Clinical Surgery. |
| Practice of Physic. | Dispensary Practice. |
| Dissections. |                          |
| Hospital Attendance. |                          |
| Clinical Surgery. |                          |

FOURTH YEAR.

| Midwifery. | Medical Jurisprudence. |
| General Pathology for M.D., Edin. | Dispensary Practice. |
| Practice of Physic (if necessary). | Practical Midwifery. |
| Hospital Attendance. | Stethoscopy, Morbid Anatomy, or other special classes. |
| Clinical Medicine. | Hospital Attendance. |
| Post-mortem Examinations in the Pathological Theatre. | Clinical Medicine. |
| Occasional attendance on an Asylum for the Insane. |                          |

PLAN OF MINIMUM COURSE OF STUDY, OCCUPying THREE YEARS.

FIRST YEAR.

| Winter              | Summer                  |
|---------------------|-------------------------|
| Chemistry.          | Botany.                 |
| Anatomy.            | Dissections.            |
| Dissections.        | Anatomical Demonstrations. |
| Anatomical Demonstrations. | Practical Chemistry. |
| Hospital Attendance. | Hospital Attendance. |
SECOND YEAR.

Surgery.
Anatomy.
Institutes.
Dissections.
Anatomical Demonstrations.
Hospital Attendance.
Clinical Surgery.

Summer.

Practical Pharmacy.
Dispensary Practice.
Hospital Attendance.
Clinical Surgery.

THIRD YEAR.

Materia Medica.
Surgery.
Practice of Physic.
Hospital Attendance.
Clinical Medicine.
Post-mortem Examinations in the Pathological Theatre.

Medical Jurisprudence.
Midwifery.
Hospital Attendance.
Dispensary Practice.

Part Third.

PERISCOPE.

PHYSIOLOGY.

M. CLAUDE BERNARD ON ABSORPTION.

Influence of Cerebro-spinal Nervous System; of the Sympathetic System; connection between Secretion and Absorption; Influence of Abstraction of Blood, of Atmospheric Pressure, of Electricity and Galvanism, on Absorption.

The nervous system does not act as the conductor of poisonous substances. Strychnia, when placed in the cellular tissue is not absorbed by the nerves, and when placed on an exposed nerve it has no poisonous effect. If strychnia is placed on the nervous centres, or in the centre of the cerebral substance, it is quite inert unless when it is absorbed by the vessels. Yet this substance, in producing convulsions, acts upon the nervous system. The veins alone absorb poisons; the nerves and arteries are not employed in their transmission. All this has been proved by Magendie.

The nervous system does not appear to have any direct influence on absorption. Paralysed members absorb, otherwise they would die. But although the cerebro-spinal nervous system has no effect on absorption, the great sympathetic exerts an indirect influence on this function. We know that on dividing the nervous filaments of the sympathetic the temperature is raised, and the circulation increased in the parts to which they are distributed. The phenomena of absorption are increased at the same time, for the conditions produced are those which are favourable to their development. We find that these phenomena occur in deep-seated organs, especially in those which are secretary in their functions. Thus, on dividing the sympathetic branches which supply the liver, the kidneys, or the salivary glands, their circulation becomes accelerated, and their secretions are increased. The phenomena of circulation and secretion are intimately connected with each other; and the latter are increased in exact proportion to the augmentation of the former.

There exists a relation between absorption and secretion, just as between endosmosis and exosmosis; the sympathetic and the intermediate. In the liver there is an external as well as an internal secretion; the former is that of bile,