examined. This condition of affairs has of late been frequently found in chronic inflammatory conditions of the stomach with stasis, and such cases as these did excellently after the disease had been treated surgically. If there is a suspicion that cancer exists, it is wiser to advise an exploratory laparotomy at once, so that, if present, steps may be taken towards eradicating the growth.

Tubercular ulcer of the Jejunum or Ileum may be suspected when evidences of phthisis exist or of tuberculosis elsewhere. They may stimulate duodenal ulcer in every way. Even at an exploratory laparotomy they may escape the observation of the surgeon. Careful palpation may reveal their presence.

To eliminate the other diseases I have mentioned, a thorough scrutiny into every source of error is required before finally determining on any one factor as the cause of the symptoms.

If there is no sign of any of these diseases, and if there is no cause of chronic congestion, such as cirrhosis of the liver, valvular disease, nephritis or alcoholism, then one can feel justified in assuming that this is only a functional neurosis of the stomach or duodenum.

It is to be hoped that scientific research in the near future will unravel the mysteries surrounding this obscure disease and light will be thrown on the many problems which at present baffle the physician.

ART. VIII.—*More about Medical Education.* By W. H. THOMPSON, M.D., &c.; King's Professor of Institutes of Medicine, School of Physic in Ireland, Trinity College, Dublin.

It may be accepted that all who take part in the education of the medical student do so with the single desire of turning out a competent medical practitioner.

Further, all would, I have no doubt, agree that the practitioner must know not only the fundamental rules of practice but the scientific reasons on which they are

based. If his knowledge be limited to the former he can never rationally vary a rule of practice should the slightest alteration in the conditions be presented. Working backwards, therefore, from the ideal goal, we deduce that to safely recognise and treat disease, requires a knowledge of pathology, bacteriology, and therapeutics. But these last-named subjects cannot be safely or advantageously acquired without a foundation of anatomy, histology, and physiology. Nor can physiology be taught without a basis of anatomy, physics, and chemistry. Reasoning in this way we arrive at a list of subjects commonly included in the *Curriculums* of the various medical schools of this country with the exception of the subjects of botany and zoology. The former of these two originally received its place because a knowledge of plants was necessary for the collection of the *Materia Medica*, the latter because of its importance in enabling the student of human anatomy to appreciate the position of man in relation to other members of the animal kingdom.

It may be contended that neither of these subjects is essential to the curriculum of Medicine nowadays. But if they are removed some of the knowledge now imparted by means of them will have to be transferred to others. Thus, the student on beginning physiology would lack a knowledge of what is meant by an animal or vegetable cell, and also the histological technique acquired in their study.

It is not the purpose of the present article to discuss the question of the inclusion or exclusion of these subjects. I wish to confine my observations to the part of the curriculum admitted to be essential by all. This resolves itself into two divisions—the one taught in the medical school, the other in the hospital. A great deal of the former must necessarily be acquired before the student can take advantage of the latter.

In a large number of medical schools—perhaps the majority—two years are assigned to the pre-hospital stage, during which the admittedly necessary subjects of

physics, chemistry, anatomy, and elementary physiology are taught. In Dublin the pre-hospital period is only one year, and students simultaneously begin attendance on hospitals and lectures in physiology. The result is, that for the first two or three months of this session, as stated in Dr. Bewley's article of last month, the physician, or possibly the surgeon, who has charge of the newly entered men, must supply more or less of the scientific groundwork necessary to make his teaching understood. This applies chiefly to physiology. If this lack of knowledge on the part of students be a serious drawback, it can be remedied in one of two ways, either by postponing the clinical instruction or by advancing the instruction in physiology to the first year of medical studies.

The point, however, is a minor one, and is only a small part of a more comprehensive complaint, to the effect that the medical school is claiming too much of the student's time, and leaving too little for the hospital. Anatomy and physiology are the subjects most blamed in this respect. For only one of these can I speak with first-hand knowledge—namely, physiology. But no evidence has been adduced to show that in either of the subjects the standard of theoretic knowledge now required is higher than that demanded twenty-five years ago during the four-year curriculum. Nor is it higher in Dublin than that now required by Edinburgh, Glasgow, Aberdeen, or Liverpool Universities, or by the Conjoint Board of England, with the examinations of all of which, save the first, I have personal knowledge.

The subject of physiology in one respect has altered. What is termed practical physiology has been introduced, to which some twenty-two to twenty-four meetings of two hours each are devoted. Possibly all clinical teachers do not realise what students learn in this class. In Trinity College—and probably the same applies to other schools—fully three-fourths of the work deals with instruction capable of direct application in the hospital ward. The detection of proteins of different

classes; the identification of sugar; the estimation of glucose; the examination of gastric juice for its essential constituents; the properties, detection, and estimation of hæmoglobin; the enumeration of blood corpuscles; the properties and means of recognition of the chief organic and inorganic constituents of urine; the quantitative estimation of urea, uric acid, total nitrogen, phosphates and chlorides; the taking of pulse-tracings and blood pressure; comprise the greater part of the work. Apparatus is supplied and maintained for these purposes, and each pair of students is provided beforehand with what is required for the day's work.

That students learn and know the above, so as to be able to apply it in hospital or elsewhere, there can be no doubt. Nor are they altogether allowed to forget it during their subsequent work in the medical school. A good deal of it is required in the course of practical pathology. Moreover, in the examination on applied physiology in Intermediate, Part II., of Dublin University, it is a routine of the *vivâ voce* to give a student a sample of blood or of gastric juice or of urine and ask for a report upon it in some definite respect, always with a view to its clinical bearing.

One would like to ask is this acquired knowledge sufficiently utilised in the hospital? There can hardly be two opinions concerning its importance or the value of taking advantage of it. The student would gain in practical knowledge of his cases by its wider application, and the teaching of the medical school would receive an impetus when it was found that what was learned to-day would next session or next year be part of the daily hospital work. The hospital would also gain by providing more extended facilities for carrying it on. No doubt, a laboratory of some sort is part of the equipment of every hospital, but the laboratory where, say, twenty students could carry out such routine observations side by side has, I think, yet to be provided. This, however, could be done by a capital expenditure of about £500,

with the service of a trained laboratory attendant at £1 per week, and a running cost of £50 a year to provide reagents, &c. The attendance of a special clinical assistant to supervise, guide, and interest the students in the work would also be required for a couple of hours every day.

Hospital teachers obviously realise that things are not as they used to be, but perhaps do not fully grasp how it has come about that the medical school is now so keen a rival for the time and interests of the student. Progress in medical knowledge in recent years has chiefly come from the laboratory side, and the teaching of the school has had to keep pace with this progress. We are all apt to forget that our teaching must serve a medical man for the greater part of his life, consequently it is imperative to keep it fully up to date. Much of what is taught to-day will within ten years be superseded by newer teaching and better methods, and in twenty years will become antiquated. In this respect it is even more incumbent upon the school than upon the hospital not to stand still, for "to stand still is to recede."

Laboratory work has thus come to be a factor in the education of a medical student which draws him more to the school now than formerly. Added to this, the system of classes in the medical school is more organised, and above all the attendance is compulsory. On the other hand, it is not compulsory in the hospital, and the class system is less developed.

The necessity for compulsory attendance at hospital can perhaps best be appreciated by contemplating the state of affairs that would ensue in a medical school if every student were free to attend or stay away as he pleased, with permission, when he did turn up, to go to any lecture that might be in progress, and to leave when he desired.

In self-protection more effort is demanded on the part of the hospital to ensure regular and continued attendance during the time set apart for clinical work. A

more systematic employment of every student's time is perhaps also desirable. To organise a working system will entail some trouble, and probably more than one attempt will have to be made before a satisfactory scheme is evolved. But the problem is not insoluble; it has been solved for other places. To realise that reform in this particular is necessary means a considerable step towards its accomplishment and towards a readjustment of the balance between the attractions of the hospital and the school. I confess, however, that I cannot altogether dispel a fear that not a few of the present generation of clinical teachers have little sympathy with laboratory work. They have not been brought up on it; and it does not appeal to them. Nevertheless, it is a factor to be taken into account and to be utilised if the best results are to be achieved.

It will be seen that I am not in disagreement with the underlying aim of the article on "Medical Education" by Dr. Bewley, to which I have referred, and which has elicited this contribution. The criticisms I have made apply to parts and features of the system which are not covered by it.

I am sorry I cannot agree with all the suggested remedies. If I might summarise them they are:—That the standard of teaching should be lowered to the level of the requirements of the average man; that all the teaching should have a direct bearing on the practice of medicine; that botany and zoology should be omitted from the medical curriculum; that both anatomy and physiology should be begun in the first year and finished off at the end of the second year; that the requirements in these subjects could be met by text-books—in anatomy of 300 to 350 pages, and in physiology of 250 to 300 pages; that a special course of instruction in clinical methods should be introduced; that a minimum of 33 per cent. of attendances should be enforced at hospital; and that, having made these changes, everything else might proceed much as before.

I have endeavoured to show that the teaching is of the nature suggested to a much greater degree than is recognised, and that the dissatisfaction with the present state of affairs has arisen more from disturbance of the old balance between the medical school and the hospital owing to the natural expansion of laboratory teaching, and the competition of an organised compulsory class system with a less differentiated voluntary one.

I should like, however, to state some objections that occur to me in regard to certain of the suggestions. First, with regard to the standard of teaching; there can be little doubt that at whatever level it is pitched only the top men of the class will reach that level. The great bulk will be content with approximations more or less remote. The object could be better achieved by regulating the examination paper so that the average man, who has honestly endeavoured to do his work, could always pass. Next, with regard to the amount of anatomy and physiology suggested as sufficient. It is difficult to think that this is seriously meant. If so, these subjects are to be reduced to less than half the minimum taught to average men during the four-year curriculum. It also means that physiology is to be reduced to a little over one-third of Starling's text-book, entitled "*The Essentials of Human Physiology*," and which represents the amount considered sufficient by the author for the medical curriculum. In passing, I may say that I should be very pleased if I thought that the majority of our students knew it even moderately well.

Before leaving the question of anatomy and physiology it may also be useful to point out that if they are to be completed within the first two years of medical studies, and an arts course carried on as well, not only will the curriculum have to be lightened by excluding botany and zoology, but also by postponing hospital work as well. A "block" will, in addition, have to be introduced at the end of the first year, and no student allowed to proceed further till he has completed the work of that year and

passed the examinations at the end of it. No anatomist and no physiologist can teach what is required within the time, to men whose thoughts are centred on the work of a previous year. Compulsory re-attendance on lectures and practical work will also have to be enforced in the case of men who have seriously failed.

There is, in addition, another general effect which would likewise follow. Under the rules of the General Medical Council no part of the final examinations can be taken before the end of the fifth year. If the preliminary subjects, with anatomy and physiology, are crowded into the first two years the result will be a much less even distribution of work than now exists. The demands on the student during the third and fourth years—by no means excessive now—would then be very light indeed, and who can doubt that the effort would correspond.

As regards the minimum of compulsory hospital attendance I am convinced the number suggested—one-third—is altogether too low, and would make matters worse, if possible, than they are now. Many men would conscientiously feel that they had done enough by attending the stated minimum who now aim at considerably more. There is no apparent or adequate reason why the three-fourths rule should be relaxed, except, perhaps, in the final year, when more latitude might be given or the roll omitted altogether.

The chief points I have contended for may be summarised as follow:—

1. That the teaching given in the laboratories of medical schools has a direct or clinical bearing to a greater degree than is generally recognised.

2. That the standard in anatomy and physiology is not higher now than it was during the four-year curriculum.

3. That the dissatisfaction on the part of the hospital with the present state of affairs has chiefly arisen from a normal development—namely, the natural growth of laboratory instruction—in accordance with the recent progress of medicine.

4. That it would be unwise to check this growth, and that the hospital would benefit by providing greater facilities for utilising to a fuller extent the laboratory teaching given to the students.

5. That the hospital would gain by adopting a more developed class system and enforcing a more regular attendance.

6. That the changes in the medical curriculum commonly suggested by clinical teachers—namely, the exclusion of botany and zoology, together with the proposal to reduce anatomy and physiology, and confine them to the first two years—would entail a postponement of hospital work till the third year or even later in the case of students who fall behind.

7. That the compression of work into the early years of the curriculum, coupled with the relegation of the final examinations to the *end* of the fifth year, would leave the third and fourth years very light, and would not help the student.

In conclusion, I would like to say that I put forward these views very diffidently and in the hope that they will at least give no offence to anyone. They have been elicited by Dr. Bewley's article, and in all likelihood would not otherwise have appeared in print.

PRECAUTIONS AGAINST STRONG ANTISEPTICS.

EVERY practitioner after handling the cork or glass stopper of a tricresol bottle has observed very troublesome and painful crevices in the epidermis of his fingers, which heal only after several months' treatment. This should be avoided by always removing and replacing the stopper with a pair of pincers. If, nevertheless, some tricresol or formalin has come into contact with the fingers, they should be dressed before retiring with lanoline cream, or perhydrol, 50 parts, and glycerine, 100 parts. Dermatol salve also renders great service. C. Fahsel in *Archiv. für Zahnheilkunde*.—*British Dental Journal*, February 15, 1910.