carcinoma; (3) diseases of the trachea and bronchi. There will be an exhibition of instruments to illustrate recent improvements in broncho-oesophagoscopy.

The committee is prepared to arrange for a limited number of short demonstrations in the museum at stated hours. Members who desire to lend material for exhibition are requested to communicate with Dr. Dan McKenzie, 62, Brook Street, London, W.

SECTION OF OTOTOLOGY.

The President of the Section is Mr. Arthur Cheatle, and the Acting Secretary Mr. Sydney Scott, 130, Harley Street, W. Messrs. J. S. Fraser, G. J. Jenkins, and Patrick Dempsey are also secretaries. It has been stated that this section is closely connected with Section XV (Rhino-logy and Laryngology), and that a subscriber to either receives the *Transactions* of each. Joint discussions on (a) the methods and results of treatment of diseases of the throat, nose, and ear by salvarsan and other arsenical compounds; and (b) special treatment of the throat, nose, and ear during the infectious fevers, will, as there mentioned, be held. The other mornings will be given up to discussions on: (a) The pathology of deaf-mutism, on which Professors Alfred Denker and Holger Mygind will report, and Professor Siebermann will give a demonstration; (b) non-suppurative diseases of the labyrinth (reporters, Professors G. Alexander and Karl von Eicken); and (c) climatic and occupational influences in diseases of the ear, introduced by Dr. Clarence Blake and Professor Gradenigo. In addition, an extra discussion has been arranged for surgical anatomy of the mastoid region. This will be held on Wednesday afternoon, August 6th, and will be opened by Professor Mouret. The afternoon sessions will be given up to independent papers.

There will be a museum connected with this section, which will be devoted to illustrating by specimens, transparencies, and other exhibits, the anatomy, physiology, pathology, and surgery of the labyrinth. Members who desire to lend material for exhibition are requested to communicate with W. M. Mollison (Secretary), 48, Brook Street, Grosvenor Square, London, W.

Entertainments.

The dinner of the combined Sections of Rhinology and Laryngology and Otology, to which all foreign members who register their names will be invited, will be held at the Hotel Cecil on Tuesday, August 12th, at 7.30 p.m. Tickets can be obtained from the Treasurer, Mr. Mark Hovell, 105, Harley Street, London, W., at the price of 2 guineas. An excursion to Oxford on Sunday, August 10th, will also be arranged. Visitors will be asked to pay their own expenses, amounting to about 10s. 6d. each, and it is possible that the numbers may have to be limited. Gentlemen wishing to give private entertainments of any kind during the Congress, and visitors who require hotel accommodation, are asked to notify the Secretary of the Entertainments Committee, Mr. Cecil Graham, 17, Upper Wimpole Street, London, W.

WE are informed that, though a large number of the children when received into Dr. Barnardo's Homes are in an emaciated condition and physically afflicted in various ways, the death-rate last year was only 5.15 per 1,000; 17,191 children in all were dealt with during the year, and nearly 9,000 are always in residence.

AT the annual meeting of the Medical Association of the Greater City of New York, the recent official request of the New York Board of Health that all practitioners should report promptly to them all cases of syphilis, gonorrhoeal infection, and chancre, together with the source of infection, if obtainable, was discussed. On the proposal of Dr. William S. Gottheil it was resolved that such notification would be an undesirable and useless invasion of the most confidential relationship between physician and patient. The mere compilation of statistics in venereal diseases, it was suggested, had no value, and the attempt to make it in this manner was a direct incentive to falsification and disobedience of the law. The measure was described as of value only as a step towards the relegation of these cases to the Board of Health, and it was urged that its ultimate effect would be to promote self-medication and quackery. It was further resolved that a committee should be appointed to decide what action should be taken in the matter.

THE REPORT OF THE ROYAL COMMISSION ON UNIVERSITY EDUCATION IN LONDON.

By ERNEST H. STARLING, M.D., F.R.C.P., F.R.S.,
JODRELL PROFESSOR OF PHYSIOLOGY, UNIVERSITY COLLEGE.

II.—THE MATRICULATION QUESTION.

THE University of London has for so long been a mere sorting and labelling machine that we in London often find it difficult to conceive of a University from any other point of view. One of the main causes of dissatisfaction with the University has been the impossibility of obtaining a label, in the shape of a degree, for the majority of London medical students. Though the inability to obtain a degree may represent a real disability to London students, and may have had an injurious action on the entries to our medical schools, it is not a matter which directly affects either the community or the science of medicine, nor could it serve as a pretext for State interference with the present University or for the grant of funds from the State for the foundation of a new University. So far as labels and examinations go, the State protects itself by prescribing a certain minimum of knowledge which must be obtained by its licensed practitioners, and has entrusted a body—the General Medical Council—with the office of guarding this standard. It is, however, of importance to the community that as many practitioners as possible should have received an education considerably transcending the prescribed minimum, and it is therefore in its interests that the general standard of medical education should be as high as possible, and that London, with its rich store of clinical material and its attraction for the greatest intellects in the profession, should be equipped and organized for the utilization of material and men and thus play its due part in the education of the profession and in the advance of medicine.

Entrance to the University.

From this standpoint the State is justified on behalf of the community in remodelling the University and employing public funds in the foundation of a great school of medicine, and endeavouring to attract to this school as large a proportion as possible of its future practitioners of medicine. The continuance of the present impediments to the entry upon a University course in London would effectively bar the new University from taking its proper share in the medical education of the country. At first sight it is not easy to make out how the measures proposed by the Commissioners will accomplish this object—that is, an increased accessibility of the University course to the London medical students. Indeed, the report evidently contemplates that at first its constituent college or colleges of medicine will be confined to the students of London, Oxford, and Cambridge Universities; and it is significant in this connexion that the report estimates that more than half of these students will have received their preliminary and early training at Oxford and Cambridge, and thus will not be in the strict sense of the term London University students at all. A more careful consideration of the report shows, however, that this will apply only for a short time immediately after the inception of the University.

In order to see how this condition of things will be remedied, it is necessary to read the parts of the report dealing with the question of entrance to the University and school-leaving examinations, together with the report of the Consultative Committee of the Board of Education.¹ In the preface to the latter report the Board of Education indicates that it is engaged in formulating a definite scheme of action in accord with the main principles laid down by the Consultative Committee in respect to school-leaving examinations, and such examinations as give entrance to universities. This report appeared in 1911, and it seems probable that by the time the new University of London comes into existence, which we may hope will not be more than three years from the present date, the Board of Education will have devised some common scheme of school examination which will apply to the whole country, and which will determine the admission

¹ Board of Education. Report of Consultative Committee on Examinations in Secondary Schools. H.M. Stationery Office. 1911. Price 2s. 6d.

to all the universities, and, perhaps, to all the learned professions. It may be interesting to anticipate, in the light of the recommendations contained in these two reports, the manner in which the Board of Education may be able to co-ordinate the multifarious school examinations, local examinations, and university entrance examinations, which at present are the terror of the schoolmaster and the stumbling-block of the students.

Most London teachers would agree that the majority of the London medical students are capable, or might be made capable, of profiting by university education of the highest type. A minority, which is probably not greater than 10 per cent., who have been crammed through some inadequate preliminary examination, ought never to have entered the profession at all. Some of these fail to qualify; others slink in after many years through some of the back doors to the profession which still exist in various parts of the country. The majority, however, fail to commence a University career simply because they have not passed the matriculation examination. It cannot be pretended that this examination is too difficult. It is, however, only suited to a certain number of schools. Boys coming from other schools would have to undergo a special preparation for this examination. At the present time the majority of the boys and girls in the secondary schools who are expecting to proceed to a University or to any profession pass some examination or other while they are at school. Of these school examinations there is an enormous number; Oxford and Cambridge both hold three examinations in addition to the Joint Schools Examinations. The students entering St. Bartholomew's Hospital in one year had passed the following examinations as entitling them to begin the study of medicine: London Matriculation, College of Preceptors, Cambridge Previous Examination, Oxford Responsions, Cambridge Senior Local, Oxford Senior Local, Oxford and Cambridge Schools Examination Board, Educational Institute of Scotland, B.A. Cape of Good Hope, Matriculation Royal University of Ireland, Central Welsh Board, Sandhurst Entrance Examination. Until a few years ago none of these examinations, except the London Matriculation itself, would have allowed a student to matriculate as an undergraduate of the London University, and even now, when a few of them are allowed as alternatives to the Matriculation, the subjects have to be taken in exactly the same combination as is prescribed for the London Matriculation, irrespective of the nature of the curriculum of the school at which the boy has been educated. The function of a University is to educate, to make the best of the students presented to it by the secondary schools, and it is neglecting its duties if it refuses to accept three-fourths of those who would enter its portals because the ideals of the school where they have been educated do not fit in to a certain Procrustean bed devised by the University.

There can be no doubt that a new University, guided by an Academic Council which regards education as the main function of a University, will at once get rid of the disabilities at present attaching to boys educated in two-thirds of the schools of the country, and will accept any school-leaving examination or local examination which affords evidence of a secondary education sufficient to enable a boy to profit by the education offered him by the University. The whole present system of school examinations is, however, temporary. University education must be hampered and kept back while secondary education is in its present inchoate and unorganized condition. Reform of secondary education will mean improved quality of the students coming to the University and greater power in the hands of the University, and this reform must be carried out by the schools themselves, and cannot be enforced on them by a system of matriculation regulations.

Let us consider what preliminary education the student needs who is to commence the study of medicine. In the first place he must have a sound knowledge of his own language, English, so that he not only apprehends what he reads or hears, but has also acquired the power of expression and of orderly thought. The development of reasoning power cannot be dissociated from the use of language, and it is one of the defects of our school education as compared with that of France that children are rarely taught to use language as an instrument.

"English" generally means English literature or English grammar, whereas every lesson in geography, in history, in chemistry or physics, should be at the same time a lesson in the use of English—that is, in the art of expression and of reasoning.¹ Since the student is to devote his time to some of the most difficult branches of biological science, he should also be acquainted with the principles of the nature and reaction of things—that is, he should have an elementary knowledge of physics and chemistry. For this purpose he will need to add to his knowledge of English a knowledge of the language of quantity and exact measurement—namely, mathematics.

Moreover, since science is international in character, he ought to have at least a reading acquaintance with one or two modern languages other than his own, and there is very little difficulty in teaching children during their school years both to read and speak sufficiently well for practical purposes two modern languages. Thus the training which a student should have received to qualify him to pass through the gateway of a medical faculty of a University should include English, mathematics, elementary physics and chemistry, and one or two foreign languages.

A medical man, however, is a member not only of a learned profession, but also of a community including individuals engaged in many other forms of activity. Social intercourse among these individuals involves a certain common fund of knowledge and interests, and for this purpose it is important that every child, whatever its future destination in life, should pass through a certain common education—an education which should give them some idea of the history and political conditions of their country, its relation to other countries, its literary possessions, and the foundations of its laws, customs, and ideals. As a result of this education, the child will acquire a fund of culture to which he may add in one direction or another according to his tastes later on in life, and it is evident that in the hands of different schoolmasters one or other side of this discipline will tend to undergo hypertrophy at the expense of the others. If, however, the education is such as to arouse the child's interest, to create mental alertness, and to impart habits of discipline, the education may be considered as having succeeded in its object.

The Scottish School-leaving Certificate.

Considerations such as these seem to have influenced the Commissioners as well as the Consultative Committee of the Board of Education in their respective reports, and to have actuated those responsible for the system which is actually in work in Scotland. In Scotland practically all the secondary schools are under the control, either in respect of grants or by their voluntary action, of the Scottish Education Department. This Department has a staff of inspectors and examiners, so that it is able to exercise a very considerable control over the curriculums in the various schools. It does not attempt to achieve uniformity among the different schools, but rather to encourage educational experiments. The work is, however, so arranged that, whereas during the early years of the pupil he is studying subjects of general culture, during the last two or three years he is specializing more in the direction of the subjects which will be of value to him in his future career. Two sets of examinations are held at the schools. The first examination is held at the end of a course, called the Intermediate Curriculum, which extends over not less than three years. This curriculum, in order to be approved by the Board, must provide for instruction in at least five subjects, embracing English (with English history and geography), a language other than English, mathematics, experimental science, and drawing. The general standard which is looked for as a condition of the award of the Intermediate Certificate is the degree of all-round proficiency which a well-taught pupil of average ability might reasonably be expected to attain at the age of 15 or 16. After gaining the Intermediate Certificate the pupil must take a post-intermediate course at the school of at least two years' duration. During this time he must study not less than four subjects taken from a fairly extensive list, and at the end he is examined, and, if successful,

¹ This point has been extremely clearly brought out by Mr. P. J. Hartog (Academic Registrar of the University of London) in his small book, *The Writing of English*.

granted a Leaving Certificate. In this examination, as in the examination for the Intermediate Certificate, comparative excellence in one branch may be held as compensating for some degree of deficiency in another. This leaving certificate in Scotland is the usual avenue to the universities. The object of the whole scheme is to free the schools and give them the determination of the direction in which the education of the pupil should develop. It has not, however, done away with university preliminary examinations, which are still regarded as necessary for candidates from India, the Colonies, etc.

School Examination for England.

It is a weak point in the Scottish system that although the Leaving Certificate is necessary for the University, a relaxation of this rule is made in the case of medicine, admission to which faculty is made on the strength of the Intermediate Certificate. The report of the Royal Commission agrees with that of the Consultative Committee in recommending the institution of two such examinations in the secondary schools of England and Wales also. The first examination, to be passed at the average age of 16, would include the subjects of general culture which form the main basis of the curriculum of the school in question. In this curriculum it is evident that the chief emphasis might be laid either on classics or on science or on modern subjects, according to the traditions of the school or the ultimate destination of the majority of its pupils.

The second examination would be held two years later—that is, at the average age of 18—and in the case of future students of medicine, engineering, or science, would probably include English, mathematics, physics and chemistry, and possibly a modern language, and in some cases biology. It is evident that many schools would not be in a position to give this further specialized education in science, which should be the leaving examination for all students intending to take up the study of any science at the University. At first, therefore, it would be necessary to admit students to the University on the results of the junior examination, and the elementary instruction in science such as that given for the Intermediate Scientific or for the Preliminary Scientific Examination would have to continue to be given at the University. Under the fostering influence of grants, however, from the Board of Education it may be possible to group the schools in different districts and to provide first-class scientific instruction in one school in each group, together with bursaries or travelling allowances for the students, so that in this school a first-rate instruction in elementary science could be given. In the same way other schools might specialize in classics. It is doubtful whether the Board of Education will be able to effect so complete a unification as is carried out under the Scottish Education Board. It must be remembered, however, that it has considerable control over the majority of the schools in the country and of the universities by virtue of the grants which it makes every year. It seems possible that, instead of forcibly abolishing all the agencies of school examination which at present exist, it may make use of them and their organizations to conduct the type of examinations which in Scotland are in the hands of the Education Board itself. It could limit a school to that form of intermediate and school-leaving examination which is most suitable to the requirements of the majority of its pupils. By its inspectors it can satisfy itself of the sufficiency of the education imparted at each school, and it will then be in a position to insist on an equivalence of all the school-leaving examinations as entrance examinations to the Universities or to those departments of the University which are in receipt of its grants.

The Place of Teachers in the New University.

The main point, however, of the report of the Royal Commission is that in academic matters the guidance of the new University will be in the hands of the teachers. The aim of the University will be teaching and not labelling, and it is difficult to conceive that it will not, either in co-operation with the Board of Education or of its own initiative, endeavour to gather into its net all those who are in need of higher education and are in a position to profit by its instruction.

A CRITICISM OF PROFESSOR STARLING'S FIRST ARTICLE.

To the Editor of the BRITISH MEDICAL JOURNAL.

SIR,—Professor Starling has contributed to your issue of May 17th a very interesting dissertation on the Final Report of the Royal Commission on University Education in London. He naturally receives the report with approbation; indeed, he may feel some pride of paternity in it, for the Commissioners have done him the honour of largely reproducing his own individual views. In their most important recommendation, that is, as to the government of the new University, the Commissioners have followed "Report A" of the Academic Council. "Report A" can be demonstrated to be chiefly, if not wholly, of Professor Starling's drafting.

With your permission I shall comment upon the recommendations of the Commission, chiefly as presented by Professor Starling.

The Preliminary and Intermediate Teaching.

Professor Starling is obviously disappointed that the Commissioners have not—ostensibly—revived his pet scheme of concentration of the preliminary and intermediate teaching in three centres. Their astuter advisers no doubt cautioned them that it would not really do to run directly counter to the Report of Lord Macnaghten's Committee of the Senate, which had condemned this scheme, root and branch, only a few months previously to the appointment of the Commission. But Professor Starling may be, and no doubt is, completely reassured; for the Commissioners really concede the substance of his aspiration; they give back with one hand what they only seem to have taken away with the other. The Concentration Scheme, it will be remembered, contemplated the provision of three centres for the teaching of the preliminary and intermediate medical studies—that is, of chemistry, biology, physics and anatomy, physiology and pharmacology. Of these three centres, University and King's Colleges, the only ones actually in being—and the only ones, some of us think, ever really contemplated—were to be two. In spite of the most energetic canvassing, no subscriptions were received in response to the appeal for support of this scheme (Senate Minutes, 1907-1908, No. 543).

To understand the present position aright it must be carefully borne in mind that University and King's Colleges are by recent Acts of Parliament protected in the permanent retention of the teaching of these subjects; wherever else they may or may not be taught, they must be retained at these colleges.

Now we are told by the Royal Commission that the preliminary subjects will, it is hoped, in future be taught at the secondary schools of the country. But, as Professor Starling admits, there is no general provision, and cannot be general provision, of such teaching for many years, if, indeed, general provision ever becomes possible. "Meantime," we are told, "the teaching of those candidates who have been unable to obtain the necessary instruction at school should be provided for, either in the Science Laboratories of the University itself, or institutions recognized for the purpose by the University." For "Science Laboratories of the University" we must read the "Laboratories at University and King's Colleges," which are the only undergraduate laboratories at its disposal. The inference is fairly obvious that the preliminary teaching will be the monopoly of King's College and University College for many years to come, if not for ever.

The suggestion that chemistry, biology, and physics should be taught at the secondary schools and cease to be university subjects seems to me, if seriously intended, the most retrograde of measures. At a time when the civilized world is ringing with the discoveries in chemical therapeutics associated with Ehrlich and his school, it seems, indeed, singularly inopportune to withdraw chemistry, for example, from the University curriculum. The teaching of these subjects at the medical schools, as at present conducted, is said by the Commissioners to be "inadequate." Is it conceivable that the secondary schools, scattered throughout the country and with necessarily small classes in these special subjects, will attract abler teachers than those now employed by the medical schools? The insistence upon a high proficiency

in the preliminary scientific subjects has always honourably distinguished the London degrees, and this recommendation must inevitably reduce the standard of their teaching.

Intermediate Studies.

We are told that King's College is to be removed to the vicinity of University College in Bloomsbury, and it is hoped to found a University quarter in London round these two favoured seats of learning. As the medical faculty is one of the largest in the University and will certainly be the largest body of residential students, it is reasonable to suppose that the new medical colleges to be established will also be in that area. The supposition becomes stronger when we are told that intermediate teaching will be conducted "in close proximity" to the new colleges—Professor Starling says by the same institutions. Keeping in mind the privileges secured by King's and University Colleges, it is obvious that two of the three new centres must include these colleges. The old scheme of concentration of preliminary and intermediates studies is thus revived in all its nakedness, with the addition that that panacea is to be applied to the clinical teaching as well. I doubt whether the addition will make the scheme any more palatable to the schools left outside than it proved in 1906-7, and the arguments which weighed with Lord Macnaghten's Committee are stronger now even than then. That committee found:

That apart from the money difficulty (that is, the absence of adequate financial support) which, in the opinion of the Committee, is of itself fatal, the scheme has also become impracticable for other reasons. The Medical Faculty, which formerly reported in favour of the scheme, has now reported against it. Several of the medical schools have changed their opinions in the same sense, and some of them had made arrangements involving considerable outlay for providing more efficient instruction in preliminary and intermediate medical studies.—Senate Minute, 1907-1908, No. 553.

Final Studies.

Professor Starling describes the Commissioners as "men whose life business it has been to act or to devise policies after taking the opinion of experts on the different problems involved." How have they done so in the recommendations as to the final studies? They consulted a very large number of representatives from the medical schools, from the Royal Colleges, and from the various educational bodies. They ignored these real experts, and have produced practically in its entirety the fantastic scheme of one, or at most two, witnesses, both with no personal experience of medical education in London; one, the chief and perhaps "the only begetter," Mr. Abraham Flexner, is an American layman who exhibited the most ludicrous ignorance of our English system; the other is a physician who had spent all his active professional life in America. The "Flexner scheme," as it may very properly be called, was indeed condemned most emphatically and specifically by witnesses with actual experience and knowledge of the questions at issue, who really can claim to be experts. Professor Starling attempts to counter this serious opposition by a mere flippancy. "Mediocrity," he says, "is certain to be up in arms at the institution of any system which promises to pick out and place in a superior position the talented, the enthusiast, and the man of genius."

When it is seen by perusing the evidence that men such as Sir A. Gould, Sir H. Morris, Sir B. Dawson, Sir A. Bowlby, Sir Thomas Barlow, Drs. Herringham, Sharkey, Frederick Taylor, Norman Moore, Campbell Thomson, Norton, Fisher, Garrod, and others specifically opposed the Flexner scheme, I think Professor Starling is sufficiently answered.

Let us, however, examine these suggestions more closely. "The most important innovation in the scheme," says Professor Starling, "and the one which promises most for the advancement of medicine in this country, is the recommendation that university professors shall be appointed to deal with the clinical subjects." The clinical demonstration on the German model is, it appears, to be the means of salvation; but the professor and his assistant are also to continue the bedside teaching which is traditional in the English schools, and which is wholly absent from the German model:

No German student (says Dr. Head) has ever handled an individual patient until he has qualified. No student enters

the wards except very occasionally in the company of his professor or his assistants. Each patient he has seen has been brought out for examination to an auditorium. (Fifth Report, p. 141.)

The change in our present system is considered necessary because our teachers are said to be unable to give the time required for the elaborate staging and accessories of the German theatrical demonstration. How, it may be asked in turn, are the professor and assistants to find time for the much more exacting bedside teaching, absorbed as they will be by the glorified public demonstrations, and the researches which are their *raison d'être*. We are told that the professor will be limited in his private practice, and so will devote more time than it is presumed the present clinical teacher does. It is obvious that it will be about as possible to limit the professor's private practice as it would be to limit his hours of sleep or the amount which he eats at his meals. I have personal acquaintance with several German professors. They have one and all been men with large practices, a circumstance which, indeed, was rendered inevitable by the prestige and reputation conferred by their appointment. An entirely erroneous opinion, which has been demonstrated by many witnesses to be erroneous, seems to be held by the Commission, that present day teachers give the briefest possible time to their duties. I had the good fortune to be clinical clerk for nine months to that incomparable teacher, the late Dr. Howship Dickinson, who used to spend from three to four hours every day of the week in his wards.

Professor Starling says:

The complete lack in London of teaching of university rank in the professional subjects of the medical curriculum was brought clearly before the Commission by Flexner.

Most persons will accord more authority to the opinion of the great universities of Oxford and Cambridge as to what constitutes teaching of university rank even than to the opinion of the omniscient Flexner; and these universities have been willing for many years to give the imprimatur of their degrees to men whose tuition in these subjects has been wholly given in the London schools of medicine.

We are told by Mr. Flexner, who gets his usual echo from the Commission, that the professor is to use his hospital ward as the chemist uses his laboratory. Those who are familiar with German hospital methods have sometimes been shocked at what appears to the English-trained man as callous handling of the sick. This new notion of the function of the hospital patient as a sort of experimental reagent is not likely to be favourably received either by the charitable public or by the hospital patient himself.

The Faculty of Medicine.

The worst feature of the scheme is that it creates two kinds of medical school: the privileged college and the school not so privileged. The teachers at the colleges are to form the new Faculty of Medicine on which the schools will be unrepresented. Professor Starling makes as much as he can out of the new "Board of Studies," which is to satisfy the outside schools, but omits to mention that whereas the college teachers, constituting the Faculty, report directly to the Senate, the Board of Studies reports to the Faculty—that is, to a body of rival teachers directly and personally interested in the ultimate extinction of the outside schools. It is said that no compulsion will be exercised on the pupils of the schools to go to the colleges, but when we consider that at the latter institutions the pupils are to be examined by their own teachers, whereas the students at the schools will have to submit themselves, with no guidance from a syllabus as to the scope of the examination, to the collegiate teachers, and will have to compete with collegiate students whose degrees, we are told, will be given rather as certificates of good behaviour during pupilage than upon examination tests; when we further consider that the privileged colleges are to be subventioned from public funds by at least £12,000 per annum for each college in addition to students' fees and Board of Education grants; when we recall that these grants are, as Dr. Headlam, late Principal of King's College, has pointed out, almost certain to be manipulated so as to enforce the findings of the Royal Commission, the conviction is forced.

upon us that the survival of the schools against such unfair competition cannot be long maintained, and is not expected to be maintained.

Professor Starling closes his dissertation with this clause, which is no doubt intended to discourage expression of dissent from his own opinion:

Those who oppose these changes (he writes) will have to show that their opposition is really based on a consideration for the welfare of medicine and the medical sciences, and is not directed by a regard for the private interests of themselves or their school.

It is equally pertinent to inquire to what degree the advocacy of those who advocate these changes "is directed by a regard for the private interests of themselves or their school." By both these canons Professor Starling stands condemned as himself the least disinterested of critics, a fact which cannot but detract from the respect which might otherwise be accorded to any avowal of his views.—I am, etc.,

London, W., May 26th.

E. GRAHAM LITTLE.

Nova et Vetera.

THE FIRST GERMAN BOOK ON SURGERY.

IN an address delivered before the St. Louis Medical History Club, and reprinted in the March number of *Janus*, Dr. Frank J. Lutz gives an interesting account of an old German book on surgery. It is entitled *Das Buch der Buendth-Erztnet* (the book of bandaging).

The author, Heinrich von Pfolzprundt, flourished about the middle of the fifteenth century. At that time, in Germany as elsewhere, the treatment of all external diseases was in the hands of barber surgeons, who were united in a guild. They learnt their art from a master, and were accepted as apprentices on condition that they were of German parentage and were considered worthy by the freemen of the city. The admission of a pupil was a function accompanied by prescribed ceremonies, which took place before the assembled council of the burghers, and in the presence of the Master. After the apprentice had served his time, and had shown himself "learned in the art," he was made a journeyman. To become a master he had to present his indenture and pass an examination. In proof of his skill he was obliged to produce a "masterpiece." This, according to the regulations for the barber surgeons of Hamburg from 1468 to 1519, consisted in a demonstration of methods of reducing dislocations. Pfolzprundt was a practitioner of this class; he learnt the elements of minor surgery in the barber's shop, and enlarged his knowledge by study under masters of renown in various parts of Germany and Italy.

His book is said to be the first surgical treatise written in German. It was composed in 1460, being thus older by thirty-seven years than that of Hieronymus Brunschwig. The manuscript of the work was found in 1858 among the effects of a doctor in Silesia, and probably had belonged to the library of the University of Erfurt. Since this was published in 1868 by Haeser and Middel-dorpf another copy has been found by Haeser in the Royal Library, Dresden, which differs in many particulars from the first manuscript.

Had the book been published at the time it was written, Pfolzprundt would have been recognized as the first to describe the operation of rhinoplasty, to which the name of Tagliacozzi, who described it 126 years later, has ever since been attached. Pfolzprundt seems also to have been the first who made special mention of gunshot wounds. His teaching as to some points in abdominal surgery shows that mediaeval practitioners were more advanced than we at this time of day are apt to believe. In the thirteenth century the Four Masters had recommended that in transverse wounds of the intestine, especially the large one, the trachea of an animal should be inserted into the lumen of the gut, which was first drawn out with a thread. The intestine was then stitched together over the trachea and brought to the wound in the abdominal wall. It was thought that in time the trachea would be disintegrated and discharged. Pfolzprundt recommended in such cases freshening the wound by complete division of the intestine and inserting a silver tube, large

enough to allow faecal matter to pass through. Over this tube the cut ends of the bowel were to be tied with green silk thread. Here we have a kind of forerunner of Murphy's button, but we are not told what became of it, or how the vitality of the gut was maintained, after the constriction of its ends by the threads tied over the tube. He says, however, that a patient so treated might survive from forty to fifty years.

Pfolzprundt seems to have belonged to a noble family which dwelt in the little town of Pfolzpaint, which is still in existence near Eichstaedt in middle Franconia, Bavaria. He was a member of the German Order, and gained considerable surgical experience in the wars against Poland. His book was written for the instruction of barber surgeons. He was an uneducated man and had no knowledge of anatomy, not even of the bones, although he had a large practice in the treatment of fractures and dislocations. He does not quote a single author. But within his sphere he was a sensible, experienced practitioner, and frequently reminds the reader how necessary it is to use common sense in adapting the treatment to the special needs of the patient. He set up a high standard of professional morality, insisting that before the surgeon attended a patient he should hear Mass unless the case were too urgent, when he should recite five Paternosters, five Aves, and the Creed. He warns the surgeon against drunkenness, and urges that he should not eat onions because of the danger to the wound from his contaminated breath, nor indulge in unclean cohabitation before handling a patient. His bandages should be clean, and he should wash his hands before dressing a wound.

The barber surgeon collected and prepared his own plants, keeping his methods of doing so secret. Pfolzprundt knew how to put "a person to sleep whom you wished to cut or one who is suffering from insomnia" by narcotic inhalations. Opium, hyoscyamus niger, atropa, mandragora, unripe mulberries, hemlock, etc., were dissolved and sponges saturated with the solution. These were afterwards dried in closed vessels in the sun or indoors. Before such a sponge was used it was placed in warm water for an hour and then held before the patient's nose until he fell asleep. After use the sponge was dried for future service. The patient was aroused from this sleep by holding before his nose a wad of charpie containing vinegar, fennel seed, and olive oil.

SCIENCE NOTES.

SOME account has already been given here of certain physiological observations at high altitudes made during the expedition to Pike's Peak under the leadership of Dr. J. S. Haldane of Oxford during the summer of 1911. Miss Mabel P. Fitzgerald has recently reported to the Royal Society observations made during the same expedition on changes in the breathing and blood in persons residing in towns, mining camps, etc., at various altitudes from 5,000 to 14,000 ft. in the Colorado portion of the Rocky Mountains. It was found that the volume of air breathed per unit mass of CO_2 produced by the body was always increased in persons acclimatized at high altitudes. The mean increase of breathing was such as to produce a fall of about 4.2 mm. (or roughly 10 per cent. of the normal for sea level) in the partial pressure of CO_2 in the air normally present in the lung alveoli for every 100 mm. of fall in the barometric pressure. Both men and women showed this fall, after allowance had been made for the normal difference in the alveolar CO_2 pressure of men and women. The percentage of haemoglobin in the blood of acclimatized persons was likewise increased, the mean increase being about 10 per cent. of the normal at sea level in men for every 100 mm. of diminution in the barometric pressure. Both men and women showed this fall. It might take some weeks for the changes to establish themselves fully in persons passing to a high altitude or to disappear in persons passing to sea level. The increased breathing and percentage of haemoglobin seem to be adaptations to the shortage of oxygen consequent on the diminished atmospheric pressure.

In his Bakerian Lecture last week before the Royal Society on positive rays of electricity, Professor Sir J. J. Thomson returned to a subject with which he dealt