

Report on the visit to the examination held at Philadelphia, PA., by the National Board of Medical Examiners, May 19th-26th, 1920 / by Sir Humphry Rolleston and H.J. Waring.

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REPORT *on the VISIT to the EXAMINATION held at*
PHILADELPHIA, PA., *by the NATIONAL BOARD OF*
MEDICAL EXAMINERS, *May 19th-26th, 1920,*
by SIR HUMPHRY ROLLESTON, K.C.B., M.D.,
F.R.C.P., and H. J. WARING, M.S., F.R.C.S.,
the Representatives of the Royal College of
Physicians of London and the Royal College of
Surgeons of England.

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INTRODUCTORY.

REFERENCE.

At the request of the National Board of Medical Examiners of the United States, the Royal Colleges of Physicians and Surgeons each nominated a representative, whose name had been tentatively suggested by the National Board, to be present at the Examination of the Board at Philadelphia, May 19th to 26th (inclusive), 1920. These two representatives together with one representative from the Triple Examining Board of Scotland (Dr. Norman Walker) and two representatives (Dr. Gustave Roussy and Dr. E. E. Desmarest) of the Faculty of Medicine of the University of Paris, formed the Commission, which was also invited to attend the Annual Session of the American Medical Association at New Orleans, April 26th to 30th, 1920, and to go on a tour of the Medical Centres at Washington, D.C., New Orleans, St. Louis, Iowa, Minneapolis, Rochester (Mayo Clinic), Chicago, Cincinnati, Cleveland, Ann Arbor, Boston, New York, Philadelphia, and Baltimore. The object of this tour (*vide* p. 22), which was fully carried out, was to familiarise the members of the Commission with the present conditions of medical education in certain Medical Schools in the United States of America, included in Class "A" of the American Medical Association's Classification (*vide* p. 5), so as to be in a better position to judge of the examination of the National Board of Medical Examiners.

For generous hospitality and unusual opportunities for the study of medical education and the examination, the Commission desire to express their sincere appreciation. The arrangements made throughout the tour were in every way admirable.

The reason for asking English and Scottish representatives to see the examination of the National Board of Medical Examiners was not only a desire for criticism, but also, as the Chairman of the Board stated at the meeting on April 20th, 1920, at Washington, D.C., as bearing on the possibility of reciprocity in Medical Qualification in the future between the United States and Great Britain. No great stress for immediate action was, however, laid on this question, as it was admitted to be hedged round with difficulties, legal and administrative, and was, therefore, not likely to come into the realm of practical politics for some time.

The work done by the European Commission may be considered under two heads:—(I.) Inspection of the Examination of the National Board of Medical Examiners, and (II.) Visits to the Medical Institutions selected by the National Board of Medical Examiners.

I.

INSPECTION OF THE EXAMINATION HELD AT PHILADELPHIA, PA.,
APRIL 19TH TO 26TH, 1920.

1. Brief History of Medical Education in the United States.

In order to make clear the position and future possibilities of the National Board of Medical Examiners, it is necessary to refer to some points in the recent history of Medical Education in the United States of America.

During the last thirty years a revolution has taken place in America as regards Medical Education. Previously the licensing of Medical Practitioners was in the hands of various Schools, most of them proprietary, and a man could obtain a M.D. degree in two years or even less. Practitioners of this type commonly came to Europe to supplement their training, and their deficiencies became a matter of common knowledge. The change of such a curriculum of two years or less to that of six or seven years now required in most Schools and States for full qualification dates from the institution of State Medical Boards to determine whether or not the Practitioners in possession of degrees granted by the Colleges and Schools in the several States should be allowed to practise. The institution of these Boards, therefore, served a very useful purpose by taking the power of licensing practitioners away from the Schools and Colleges, many of which were commercial and irresponsible bodies. Since 1892, mainly as the outcome of the stimulus of the late Sir William Osler, then of the Johns Hopkins Hospital, Baltimore, the general standard of the State Boards has been steadily raised. But at the present time the State Medical Boards suffer under considerable disadvantages: each Board is appointed by the Governor of the State, and in order to prevent undue influence of any one Medical School or College in the State the members of the Board may not be connected with any teaching Institution in the State. The Examiners are, therefore, independent practitioners in the State, and in some States there is a regulation to the effect that not more than a certain proportion of the State Board shall belong to any one sect in Medicine, and accordingly in such States homœopathists may be on the Medical Examining Board, and indeed it is possible for an osteopath or an eclectic to occupy this position: in some States there are two or even three Examining Boards—one allopathic, one homœopathic, and one eclectic. Further, the examinations, which are held four times a year, are almost universally written only; and it is quite exceptional, as in the State of Illinois, for any attempt at a practical examination to be made. An additional year as intern, such as is demanded by the National Board of Medical Examiners, is required by nine only

of the forty-eight States of the Union, namely, by New Jersey, Alaska, North Dakota, Michigan, Pennsylvania, Rhode Island, Washington, D.C., Illinois, and Iowa. But in spite of defects as judged by present-day standards the Institution of the State Medical Boards did a great deal to improve the conditions of Medical Qualification and so of education at the close of the last century. Later, Mr. Abraham Flexner's report (1910), written after personal investigation of the Medical Schools of North America, for the Carnegie Foundation for the Advancement of Teaching, and the activities of the American Medical Association, especially in grading the Medical Schools into three classes, "A," "B," and "C," caused the extinction of a number of inferior Schools which had been adversely reported on and had been graded "B" or "C." This is shown by the following figures* :—In 1906 there were in the United States of America, 162 Medical Colleges †, or more than half the total number in the world, and of these only four Schools required previous College work (Physics, Chemistry, and Biology) before admission to the Medical course. In 1920 the number of Medical Colleges had fallen to 86 and 79, or 92 per cent., of these require from students credentials of College work before admission. Of these 86 Schools, 77 are non-sectarian or regular, five are homœopathic, one is "eclectic" (much interested in herbs), two are semi-osteopathic, and one is not recognised by its State (Missouri). Of the 86 Medical Colleges now existing 70 are graded by the American Medical Association as Class "A," eight as "B," and eight as "C." Eleven of the 70 "A" Class Schools teach only for the first two of the four years' Medical course—namely, not in clinical work. One of the homœopathic Schools (Hahnemann's College, Philadelphia) is graded as in Class "A."

The requirements of the Medical Schools classed "A" vary to some extent, but the constant features are :—

- (1) Two years of College instruction in Physics, Chemistry (Organic and Inorganic), and Biology, before admission to the Medical School.
- (2) Four years of Medical training.

The first two or pre-clinical years include anatomy, bio-chemistry, physiology, bacteriology, pathology, and pharmacology. The third and fourth years are devoted to clinical work. After four years of the Medical course graduation follows, except in the following eleven Medical Colleges and Schools* in which a further year of intern work is required :—

University of Minnesota.
Leland Stanford Junior University.
Rush Medical College, Chicago University.

* *Vide* Journal Am. Med. Association, Chicago, 1920, lxxiv. p. 1245.

† Including all varieties, there have been 439 Medical Schools, existing and extinct, in the United States. (*Ibid.* 1919, lxxiii. p. 512.)

University of California.

North-Western University of Chicago.

University of Vermont.

University of Illinois.

Loyola University, Chicago.

College of Physicians and Surgeons, Los Angeles.

Columbia University, College of Physicians and Surgeons, N.Y.

Detroit College of Medicine and Surgery.

Other variations in the requirements demanded by "A" Class Schools are seen in the credentials of applicants for admission to the Schools: thus the Johns Hopkins Hospital requires the B.A. degree, and Harvard either a B.A. degree or that the student shall have been within the first 1/3 of the class in the two years' College course of the pre-medical subjects (Physics, Chemistry and Biology). Many schools require in addition evidence of knowledge of one, and some of two, foreign languages.

The University of Chicago demands a physical examination, before admission both to the pre-medical or College course and to the 4-years' Medical course: and in addition the intending student goes through a psychological examination. The average age of students graduating in Medicine from this University is 28 years. The University of Minnesota has for four years required from students wishing to enter its Medical School an honours mark (96 per cent.) in the two years of College work, a physical examination, psychological tests for mentality based on Binet's tests, and an examination on general information: last year there were 150 applicants, of whom 80 were accepted. Women students are admitted to nearly all the Schools that were visited: at Cornell they form 15 per cent. and at Pennsylvania University six per cent. of the total number of Medical Students.

It is admitted that all the Schools now classed as "A" are not of exactly the same standard, and that some of the Schools so classed were not in all respects up to the ideals of the selecting Committee, a 75 per cent. standard of the ideals set up being at present considered the qualification.

The "A" class of Schools that the Commission visited always have more applicants than there is room for, and they therefore are able to select their students and maintain the standard set up. During the first year unsuitable students, sometimes to the extent of 15 per cent., are weeded out: the vacancies thus arising are filled by students from other Schools, especially those which restrict instruction to the subjects of the first two medical years.

From this summary the conclusion appears to be justified that the educational demands for admission to the Medical Schools classed as "A" are very different from those in the past, and that, as the National Board of Medical Examiners demands much the same standard, its conditions of admission to examination are in this respect on a high level.

2. The National Board of Medical Examiners.

(1) The National Board of Medical Examiners was founded in 1915 by W. L. Rodman, M.D., "to establish a standard of examination and certification of graduates in Medicine for the whole United States and its territories, through which by the co-operation of the State and Territorial Boards of Medical Examiners its licentiates may be recognised to practise Medicine." The object is to enable its licentiates to practise Medicine in *all* the States of the Union that have accepted the Board's certificate, without any further examination by the State Board, "and to elevate the standard of qualification for the practice of the profession of Medicine." Twenty of the 48 States have agreed to accept the certificate of the Board in this sense: and favourable legislation and endorsement of the Board are pending in twelve other States. Candidates passing this examination may enter the regular Corps of the Army or Navy without further examination. A Charter is likely to be granted by Congress in the Autumn of this year (1920). At present the National Board is financed by the Carnegie Foundation for the Advancement of Teaching.

(2) The first examination of the Board was held at Washington, D.C., on October 16th to 21st, 1916, and the eighth examination simultaneously at St. Louis and Chicago on February 18th to 25th, 1920. To these eight examinations 211 candidates were admitted and 177 received the licence. At the ninth examination (May 18th to 26th, 1920) 60 candidates were admitted to the examination. In connection with the high percentage of successes (84 per cent.) during the first eight examinations, it must be remembered that before admission to the examination the candidates have to show evidence of a high-grade education, and that considerable selection is thus effected: further, the wide scope of the examination (*vide* p. 9) and the high pass mark demanded (75 per cent.) probably deter men of inferior calibre from entering.

(3) The Board consists of 18 members. Six are allotted to the Medical Corps of the Army, Navy, and Public Health Service, consisting of the three Surgeons-General who do not examine, and three subordinate officers, one nominated by each, who examine in certain subjects.

Three members represent the Federation of State Medical Boards. At present these are: the President of the Federation, Dr. D. A. Strickler, Secretary of the Colorado Board, Denver (to whom further reference is made below in connection with the subject of homœopathy); the Secretary-Editor, Dr. W. L. Bierring, President of the State Board of Health and Medical Examiners, Iowa; and Dr. Herbert Harlan, President of the Maryland State Medical Board. These three representatives examine respectively in (1) Ophthalmology, (2) Pharmacology and Medicine, and (3) Anatomy and Oto-laryngology.

The remaining nine "members at large" elected by the Board are at present:—

Prof. Victor Vaughan, Dean of the University of Michigan, Ann Arbor, a member of the Association of American Physicians, and Examiner in Physiological Chemistry for the National Board.

Dr. W. Andrews of Chicago, of the American College of Surgeons, Examiner in Surgery for the National Board.

Dr. L. B. Wilson, Pathologist to the Mayo Clinic, Chairman of Committee of American Medical Association to consider Graduate Education, Examiner in Pathology for the National Board.

Dr. I. Dyer, Representative of the Association of American Medical Colleges, Lecturer on Dermatology and Dean of Tulane Medical School, New Orleans, Examiner in Dermatology for the National Board.

Dr. H. D. Arnold, Chairman of the American Medical Association's Council on Medical Education, was formerly Dean of the Graduate School of Harvard University, and Physician to the City Hospital and lecturer in Tuft's College, Boston; Examiner in Medicine for the National Board.

Dr. Austin Flint of New York, Professor of Obstetrics and Clinical Professor of Gynæcology at the New York University and Bellevue Hospital Medical School, and Examiner in Obstetrics and Gynæcology for the National Board.

Dr. W. S. Carter, Professor of Physiology in the University of Galveston, Texas, and Examiner in that subject for the National Board.

Two non-medical members have just been appointed for their knowledge of Medical Education and organisation:—

Mr. H. S. Pritchett, President of the Carnegie Foundation for the Advancement of Teaching.

Mr. J. G. Bowman, Director of the American College of Surgeons, and in that capacity investigator of the standardization of hospitals for intern service.

(4) Tenure of Office: "The Surgeons-General shall be members while they continue Surgeons-General, and may be elected 'at large' after their retirement. The terms of membership of the present (1919) members of the Board other than Surgeons-General shall be six years, with six additional years."

"Re-election: Members, other than Surgeons-General and the Secretary, may be re-elected for one succeeding term, and, after two (2) years from the expiration thereof, may be again elected."

(5) Requirements for admission to the Examinations of the National Board of Medical Examiners.

Candidates are required to show evidence of having satisfactorily completed :—

- (a) A four years' course at a high school.
- (b) Two years of acceptable College work, including Physics, Chemistry (Organic and Inorganic), Biology, and one modern Language.
- (c) Graduation from a Class "A" Medical School (American Medical Association Classification, *vide* also pp. 5 & 6).
- (d) One year's internship in an approved hospital or laboratory.

It may be noted that a candidate is not required to have passed the examination of his State Medical Board.

The credentials of candidates are critically examined by an official (Mr. Loman), who, as Secretary of the State Medical Board of Pennsylvania, is thoroughly experienced in this work: he comments on them, and then submits them for final decision to the executive committee and, if necessary, to the full National Board of Medical Examiners.

(6) The scope of the examination of the National Board covers the following subjects of the Medical curriculum :—

1. Anatomy :

Microscopic.

Embryology.

Histology and Organology.

Neurology.

Gross.

Osteology.

Dissection.

Applied.

Regional, Topographical, Surgical.

2. Written and Clinical Physiology.

3. Physiological Chemistry.

4. Pathology and Bacteriology :

Bacteriology.

Microscopic Pathology.

Gross Pathology.

Surgical Pathology.

5. Materia Medica and Therapeutics.

6. Medicine :

Theory and Practice.
 Physical Diagnosis.
 Laboratory Diagnosis.
 Diseases of Nervous System, including Psychiatry.
 Diseases of Children.
 Tropical Medicine.
 Medical Jurisprudence.

7. Surgery :

General, including Minor Surgery.
 Operative Surgery (laboratory).
 Special Surgery (clinical only).
 Ear, Nose, and Throat.
 Eye.
 Skin Diseases.

8. Obstetrics and Gynæcology.

9. Hygiene and Sanitation :

Sanitary Science.
 Epidemiology.

NOTE.—In the case of applicants who desire to enter the Medical Corps of the Army, Physics is also required as an examination subject.

The examination is written, oral, and practical, including the clinical examination of patients and laboratory technique.

(7) Standard of Examination: It is regarded as essential that the standard should be higher than that of any of the State Boards. The passing grade is an aggregate of 75 per cent., and a candidate receiving a mark below 50 per cent. in one subject or below 65 per cent. in two subjects fails, even though he obtains a total of 75 per cent.

3. Criticisms.

(1) The National Board of Medical Examiners is, apart from the six official positions allotted to the Services and the three positions held by representatives of the State Boards, self-elective. The nine general Members might, perhaps with advantage, be nominated by special bodies, such as the American Medical Association, the Association of American Physicians, the American Surgical Association or the American College of Surgeons, the American Association of Pathologists and Bacteriologists, and the American Ophthalmological Association. Further, it would be well to maintain the entrance of new blood at frequent intervals. The personnel of the Board should be representative of the highest

professional ability in all branches: for example, well known University Professors in every subject would strengthen its status. The ultimate function of the National Board would logically appear to be to take the place of the State Medical Boards as far as the examining is concerned; indeed, at present 20 States accept the certificate of the National Board as excusing from their examinations. In the meanwhile there are three representatives of the State Medical Boards on the National Board, and although at the outset this may be politic, it does not strengthen the personnel. The Medical Examiners of the State Boards for the granting of the licence to practice are appointed by the Governors of the States, and cannot include existing teachers in Medical Schools: this constitution of the state Boards is obviously unsatisfactory. In some States there is a law that not more than a certain proportion of the State Medical Board shall consist of one sect of Medical practitioners; in other words, homœopathists will be on the Board. The President of the Federation of State Boards, Dr. D. A. Strickler, a specialist on ophthalmology and oto-laryngology in Denver, was educated at Hahnemann's Medical College, Philadelphia, and has not broken away from the homœopathic sect. As President of the Federation of State Medical Examining Boards he was elected a member of the National Board of Medical Examiners, and his connection with homœopathy is an accident. As the presence of a homœopathist, if even so in name only, appeared to render it desirable, further enquiry was made. We were informed that homœopathy in the United States is not regarded in quite the same position as it is in Great Britain, and that, as the sect is losing ground, the American Medical Association consider that opposition would delay the final extinction of homœopathy, and accordingly that course is not adopted. Of the five homœopathic schools in the United States of America, one, in Philadelphia, is recognised as an "A" class School—that is, in the same class as the foremost Medical Schools in the country. This School was visited, and the equipment and laboratories were found to be as good as in two other "A" class Schools (viz., Tulane University and the St. Louis University) that were inspected. The Medical course is the same as in orthodox Medical Schools as to duration and subject-matter, except that in the pharmacological course the principles of homœopathy are taught side by side with orthodox pharmacology. As showing the difference of the point of view in the United States as compared with this country, it may be mentioned that the State University of Michigan at Ann Arbor—a very well-equipped and well-organized medical school—also takes homœopathic students. This is due to the conditions laid down by the State which finances the University. The University of Boston, also an "A" class school, gives courses in homœopathy.

(2) The examination includes practically all the subjects of the medical curriculum except Physics, General Chemistry, and Biology, and is completed in seven days (papers in the mornings, oral and

practical in the afternoons). It would obviously be difficult for any candidate to pass such an examination demanding an all-round standard, according to our ideas, of 75 per cent. It is true that the examination in the fundamental subjects is correlated with practical medicine and is not academic: thus the examination in physiology is professedly on "clinical" or applied physiology.

The scope of the examination is so wide that the strain on the candidate is considerable. The Board is fully conscious of this, and is at present considering the suggestion that the examination should be divided into three parts, to be passed at the usual periods of the medical curriculum. While rather difficult to organise, this would no doubt meet the objection; but it appears to the representatives of the Royal Colleges that the main purpose of the Board would be met if the examination was confined to Medicine, Surgery, Gynæcology and Obstetrics, special subjects (dermatology, ophthalmology, and oto-laryngology) and Pathology. As the credentials of candidates for admission include education at one of the "A" class schools, where the instruction in the fundamental subjects is generally of a high standard, the omission of examination in the fundamental subjects would not impair the value of the Board's licence, provided that the Board inspects the "A" Schools and satisfies itself as to the teaching of the fundamental subjects (anatomy, physiology, bio-chemistry, bacteriology, pathology, and pharmacology).

(3) The chief examiners, who are nearly always members of the National Board, set the papers, correct them, and supervise the practical examinations. This is obviously desirable in order to maintain a constant standard. With a progressive increase in the number of candidates the maintenance of a constant standard must become more difficult; indeed, this is already the case with the oral and practical examinations in which a number of local teachers are utilized as assistant examiners. It is important that these assistant examiners should be of a certain status, such as professors or associate professors, and should have had experience in the duties of examining, and it would be well if a printed scheme of the scope of the examination and the marking were provided in advance so as to avoid the necessity of verbal explanations at the outset of the oral and practical examinations. The difficulty in keeping a continuity of standard in the practical and oral parts of the examination is due to the fact that as the place where the examination is held changes on each occasion, the assistant examiners, being recruited locally, may have little or no previous experience of this examination.

(4) In nearly all the oral and practical examinations the candidate is examined by one examiner only and without the presence of an assessor; the exception observed was in part of the practical examination in clinical Medicine and Surgery—namely, in the long cases; in these instances the candidate's

written account of the cases was submitted to two examiners sitting at a table and away from the patient, who, being under examination by another candidate, was not available for verification of the first candidate's statements. It would be advisable that candidates should be always examined in the presence of two examiners, and that the marking of the oral and practical examinations should be the outcome of a deliberation between the two examiners. Arrangements should also be made to avoid the possibility of a candidate being questioned by one of his own teachers. During the recent examination there have been occasions on which a local candidate has been examined by an assistant examiner who had been his teacher, and without the presence of a second examiner or assessor.

(5) The papers in Medicine and Surgery are too long. In Medicine the paper contained twelve questions of which ten must be answered, and in Surgery there were eight questions of which seven were obligatory. For the purpose of an examination with a 75 per cent. standard, it would be advisable to have a smaller number of questions, all of which should be answered in full detail.

The questions in the various papers should be reviewed by the Secretary so as to avoid repetition of much the same question: during this examination the "diagnosis and treatment of Graves's disease" appeared in the Medicine paper, the "pathology of hyperthyroidism" in the Pathology paper, and in the Physiology paper "what is hyperthyroidism?"

(6) Obstetrics: The examination in obstetrics was quite comprehensive and well done. During the practical examination the manikin and the full-term fetus cadaver were used, and the candidate was asked to perform many obstetric operative procedures.

(7) The practical examinations resemble those of the Conjoint Examining Board in England, but with some modifications: thus in the practical examination in "clinical" physiology, candidates are asked to listen to patients' hearts, to apply blood-pressure apparatus, and to test the reflexes. This is in accordance with the general intention of the Board's examination to correlate the earlier subjects with the practice of Medicine rather than with academic science. In the practical examination in pharmacology the candidates watched an animal experiment, and were asked from observation of the blood-pressure, pulse and respiratory tracings, and the amount of urinary excretion to deduce the drugs (three in number) that were injected into the veins during the experiment. In the practical examinations in clinical Medicine and Surgery one long case and one short case were given to the candidate. It would be advisable that when the candidate is taken over the long case one of the examiners should check the candidate's written report on the patient. Further, it would be

better to have more than one short case available for rapid diagnosis.

(8) During the examination in Surgical technique, five candidates were examined at the same time by one examiner, questions being asked of each candidate in turn. After the expiration of 15 minutes, marks were allotted to each candidate, and then a similar batch came in. It does not appear possible to estimate correctly the knowledge of candidates by such a method.

(9) The practical examination in dermatology, ophthalmology, and oto-laryngology were well arranged. In ophthalmology the candidate was first examined on one or more cases not requiring the use of the ophthalmoscope, and then was passed to an examiner in another room, where he examined the fundi of two or more cases—usually of a medical character, *e. g.*, tabes. In dermatology the candidate was rapidly shown several cases; and in diseases of the throat the candidate was asked to carry out an examination of the nose, larynx, and ears of a patient before him, a laryngoscope and other necessary instruments being provided.

(10) The 75 per cent. of marks required by the National Board of Medical Examiners is, according to our views, a very high standard; for it implies to a British examiner a mark of 25 per cent. above the ordinary pass mark of 50 per cent. In looking over some of the papers of candidates, the pass mark was therefore taken as 50 per cent., and not at the 75 per cent. of the National Board. Examination of samples of several papers* showed that when treated on these lines few candidates obtained 75 per cent. of the marks, and comparison of the marks of the official examiners in Medicine and Clinical Physiology with those given by the representative of the Royal College of Physicians showed some, but not constant, evidence of the difference that would be anticipated between a 75 per cent. pass mark and a 50 per cent. pass mark with a necessary 25 per cent. excess to satisfy the requirements of a high-class examination. In the practical examinations in Anatomy, Physiology, and Pathology the tendency of the assistant examiners was to avoid giving a mark below that necessary to pass, even when the candidate's knowledge was admittedly poor. The marks awarded by one assistant examiner in the oral of Clinical Physiology ran as follows:—

80, 100, 100, 90, 90, 70, 70, 70, 100, 80,
100, 100, 90, 90, 80, 80, 100, 80 per cent.;

whereas the Senior examiner during the same examination gave one candidate 20, one 30, four 40, and five 50 per cent. of the

* Papers in Medicine, Clinical Physiology, Anatomy, Bacteriology, Pharmacology, and Surgery were thus examined, but opportunities for comparison with the official examiner's marks arose only in Medicine and Clinical Physiology.

marks, thus showing a want of uniform standard. The tendency of the assistant examiners to avoid giving a low mark and thus to differ from the senior examiner was seen in other practical examinations, and is natural enough in inexperienced examiners.

(11) *Future development of the National Board of Medical Examiners.*—As it seems probable that eventually the National Board of Medical Examiners may take the place of the various State Medical Boards and so provide a one-portal system for the licence to practise, the question as to the machinery by which this can best be carried out must arise sooner or later: while it is essential to ensure the continuity of standard, it would hardly be possible for one group of examiners, even if the examinations were held quarterly, to examine all the candidates in the United States of America. It is suggested that a thoroughly representative National Board of Medical Examiners should appoint several complete Boards of Examiners, each for a group of States, and that the personnel of these Boards should be kept intact for several examinations so as to maintain a constant standard. The personnel of these Boards should consist of active teachers in Medical Schools of States other than those belonging to the group to which the teachers are appointed as examiners. The National Board of Medical Examiners would thus be responsible for the appointment of examiners, would direct the scope and standard of the examinations, and be responsible for the organisation of the examinations. For example, if four Boards of Examiners (A, B, C, and D) are constituted to conduct the examinations for four groups of States, each Board should consist of two Examiners in Medicine, two in Surgery, two in Gynecology and Obstetrics, two in each of the special subjects, and two in Pathology. In order to maintain a constant standard, one Examiner in Medicine at Board "A" should exchange places at the next examination with a corresponding examiner from Board "B." A similar exchange of examiners should take place between Boards "C" and "D." On the next occasion exchanges should be effected between Boards "A" and "C," and "B" and "D," and so on, so that in turn each examiner will have examined with all the others in the same subject. This principle, if carried out in all branches of the examination, should very soon establish an equal standard for the four Boards.

(The establishment of separate Boards of Examiners, consisting of representatives of the Professorial Staffs of Universities to conduct the examinations for groups of States with interchange of examiners was also suggested by Mr. F. G. Hallett in his address before the Conference on Medical Education of the American Medical Association in Chicago in February 1912.)

4. Recommendation as to Licence of the National Board of Medical Examiners.

From the evidence of previous education demanded from the candidates (*vide* p. 5) and from inspection of the Examination at Philadelphia from May 19th to 26th, 1920, it appears desirable that the holders of the Licence of the National Board of Medical Examiners should be admitted direct to the Final Examination of the Examining Board in England by the Royal College of Physicians of London and the Royal College of Surgeons of England.

It is not improbable that the above recommendation, if adopted, may be helpful in the future consideration of reciprocity in medical qualifications between the United States and Great Britain. So many other factors, however, of a national, legal and administrative character bear on any decision that may eventually be made that further reference to this matter would be premature.

II.

IMPRESSIONS FROM INSPECTION OF CERTAIN " A " CLASS SCHOOLS.

II. IMPRESSIONS FROM INSPECTION OF CERTAIN " A " CLASS SCHOOLS OF MEDICINE selected by the National Board of Medical Examiners.

1. The Difference between the Medical Curriculum in the United States and that in Great Britain.

Remarks on the Medical Schools of the United States must be prefaced by the statement that those visited were chosen for, not by, the European Commission, and that they were all of Class " A," including the most famous ones in the country, such as Washington University, St. Louis, the Medical School of the University of St. Louis, Missouri, the Universities of Iowa and Minnesota, the Western Reserve University, Cleveland, the Universities of Harvard, Columbia, Pennsylvania, and the Johns Hopkins University. In addition to these Medical Schools the Hospitals in the attached list were visited (*vide* p. 22). In all 22 Medical Schools and 36 Hospitals in fourteen centres were inspected.

The Medical curriculum in Great Britain occupies approximately five years, whereas generally in the United States the Medical Course occupies four years. It might therefore appear that a serious difference existed; but this is not so, for the subjects of physics, chemistry (organic and inorganic), and biology, which are included in the five years of the British curriculum, are relegated to the two years' College Course which precedes the four years' Medical Course.

The arrangement of the four medical years differs from that adopted in Great Britain mainly in the earlier introduction of bacteriology, elementary pathology, and pharmacology. Thus bacteriology is linked with biology and is taken during the first year or early in the second year, and is followed by pathology, these subjects running more or less concurrently with anatomy and physiology. The last two of the four years' Medical course are given up to clinical work. The main disadvantages of the early introduction of bacteriology and pathology are (i.) that the candidates having as yet no knowledge of disease are therefore prone to regard bacteriology in the same light as biology, namely, as a subject to be got rid of as soon as possible, and (ii.) that systematic bacteriology and pathology are not taken up again later in the Medical course. These disadvantages are now becoming recognized in America, and it is possible that there may be some change such as the postponement of the bacteriological and pathological courses to a later period of the curriculum or an arrangement whereby the early elementary courses are supplemented by later and more advanced courses. It should be mentioned that in the third and fourth years there are in some schools weekly clinico-pathological conferences on the necropsies, and that ward work and the clinical laboratories are intimately associated.

The practical work in the bacteriological, pharmacological, and physiological laboratories is of a high standard and the students perform animal experiments under the direction of instructors.

The anatomical courses are divided into (i.) gross anatomy, (ii.) microscopic anatomy which is thus separated from physiology, (iii.) embryology, and (iv.) the structure of the central nervous system, and in this class degenerations of the spinal cord are studied.

There is in practically all the Schools visited an almost unlimited supply of anatomical material. This appears to be ensured by the fact that there are State laws which allocate to the Medical Schools all unclaimed bodies. In many of the Schools one cadaver is supplied to each pair of students, and in others one cadaver to four students. In this latter case it seemed general to allocate a second cadaver to the same group of students at the end of the first term's dissection. Regional anatomy by the study of frozen sections was taken after the completion of the dissection. In the histological and pathological laboratories sets of microscopical specimens are lent to the students.

In the Medical Schools inspected the number of students was limited usually to 100 or less (though Harvard admits 125) in each year, and the number of applicants was always in excess of those accepted. As the number of Medical Schools has greatly diminished within the last 15 years (*vide* p. 5) the question has naturally arisen whether or not the limitation of Medical students will not lead in the course of a few years to a shortage in Medical practitioners. In 1904 there were 28,142 Medical students in the United States, and in 1919-1920, 13,554 students. This problem has been

considered by the American Medical Association and the conclusion has been reached that there is no reason to fear a general shortage, for the proportion of Medical men to the general population is 1 to 720 as compared with 1 to 1500 in Great Britain: but the failure is in the distribution of Medical men, who collect in towns, and thus cause a local shortage in the country districts. This tendency would appear to be accentuated by the manufacture of more highly-educated graduates who would naturally be attracted by hospital appointments and laboratory facilities. Statistics* show that the low ebb of entering Medical students, traceable to the increased demands of entrance and possibly to the war has passed, and that a higher number of enrolled students has set in.

2. The first Two Years of the Medical Curriculum.

The two pre-clinical years of the four-year Medical course are devoted to laboratory work under full-time teachers. Here there was an active spirit of expansion and a remarkable degree of progress was obvious. The laboratories were modern and well equipped, and the courses well organised and the instructors active. The best of these laboratories and courses were as good as any in Great Britain. It should be mentioned that the yearly sum (150-200 dollars) paid by the student does not meet expenses: in some schools (*e. g.* Iowa) each student's education is estimated to cost 5000 dollars, or more than six times the amount that he contributes during his four years: the excess is provided by the University, which either has endowment to draw on or recovers the money from the State or Municipality.

In some laboratories undergraduate students prolong their work beyond the routine period, so as to do original research or to obtain a science degree: this is naturally encouraged by teachers, as it may attract men to take up teaching and research in these subjects as a career: the lack of men willing to devote their lives to teaching and research in anatomy, physiology, pharmacology, bacteriology, and pathology is becoming a serious problem. This may well be due, at least in part, to the greater material rewards offered by the practice of surgery, the specialities, and to a less extent of internal Medicine, for the salary of the whole-time professors in the subjects of the first two years varies from 3500 up to 6000 dollars a year.

The work of these whole-time teachers appears to be so arranged that they usually have a certain part of the academic year free to devote to original work.

3. The last Two Years of the Medical Curriculum.

In the two last years of the four-years' Medical course the students have free access to the wards and clinics: for example, at the University Hospital, Iowa, the wards are open to them from

* *Vide* Journ. American Med. Assoc., Chicago, 1920, lxxiv. 1248.

8 A.M. to 10 P.M. They clerk and dress, usually for periods of two months each, and their work is closely supervised by instructors. Some of these classes were seen when inspecting the hospitals: and at Cleveland the round of the half-time professor of Medicine was followed, the students being instructed by the Socratic Method. At the Johns Hopkins hospital the weekly round of the Physician-in-chief with the residents was followed, and at Chicago, Ann Arbor, and elsewhere the amphitheatre instruction of students was observed. The Medical students of the University of Minnesota in the last six months of their fourth year become student interns, resident in the Municipal Hospital of Minneapolis and in the Hospital of St. Paul. It was not, however, so easy to watch the routine clinical teaching of students as to see them at their laboratory work, partly because the period of the visit coincided with that of examinations and the close of the academic year. The clinical instruction is probably on the same basis as that in British Schools, though junior teachers (instructors) appear to play a more important part—at any rate, officially.

Experimental Surgery. In many of the Schools visited, courses of experimental Surgery on the dog were given to students, either during the latter part of the second year or the early part of the third. Operations were performed with all the aseptic precautions used in human operations, and usually one of the students acted as "General Practitioner" and looked after the "patient" and reported the progress and results to successive meetings of the class. These courses appeared generally to be well thought out, and to be a very useful preliminary to the study of operative Surgery.

The clinical laboratory is intimately related to ward work: many hospitals have small special metabolism wards, for example, for the investigation of diabetic cases and the basal metabolism of hyperthyroidism. An extension of this scientific investigation of disease is seen in the establishment of laboratories for experimental Medicine, for example, the H. K. Cushing Laboratory of Experimental Medicine, under Professor G. N. Stewart, at the Western Reserve University, Cleveland: some years ago the Rockefeller Hospital was added to the Rockefeller Institute, and intensive studies in pneumonia, diabetes, measles, and heart disease have been undertaken. It is under the supervision of Dr. Rufus Cole, and is a research hospital only, and therefore not open to ordinary students.

The teaching of children's diseases, with which is combined that of infectious diseases, is in some schools organised as a special department, apart from general medicine: for example, at the Johns Hopkins, Washington University of St. Louis, and the Western Reserve University, there are professorships of pediatrics, which at the two former are whole-time appointments.

The formal lecture appears to be generally obsolete, though demonstrations in the amphitheatre over a patient may to some extent approach to it on occasion.

4. Whole-time Clinical Teachers.

The question whether or not a clinical teacher should be rigidly whole-time, has been much discussed in America. At the Johns Hopkins Hospital and at Washington University there are absolutely whole-time professors in Medicine, Surgery, and Pediatrics, who may at their own discretion go out to consultations, the fees being paid either to the hospital or to the professor's own department: these professors receive a fixed salary which in pre-war times was probably adequate, but is not so now. Recently a full-time professor of Surgery has been appointed at a salary of 15,000 dollars a year at the University of Michigan; the whole-time Professorship of Medicine there is vacant, and in the meanwhile the assistant Professor of Medicine is whole-time on a salary of 5000 dollars a year. At several Universities and Hospitals the clinical professors are almost, but not in an obligatory sense, whole-time: thus at Iowa University the professors in Medicine and Surgery average two and one hours a day respectively of private practice. The Professor of Psychiatry there is whole-time and receives 8000 dollars a year. At the Peter Bent Brigham Hospital, Boston, the chief Physician and Surgeon each receives 10,000 dollars a year, and they are allowed to have private cases in the hospital and to accept fees.

Private wards are a prominent feature in most hospitals, and as not only the chief but the other Physicians and Surgeons often have their private consulting rooms in the hospital, private practice does not distract them from their hospital duties to anything like the extent that it does in this country. In the University of Pennsylvania the professors of Medicine and Surgery are half-time and receive 4000 dollars each a year, whereas the assistant or associate professors are whole-time and receive 1000 dollars a year. At the Western Reserve University, Cleveland, the half-time Professor of Medicine receives 3000 dollars a year, while his two whole-time assistants both receive the same sum of 3000 dollars. There is a rather widespread feeling that, given the right man for a Professorship of Medicine, it is advisable to allow him to decide how much consulting practice he can do without any detriment to his teaching functions. But in the past this has not proved an infallible plan.

5. Graduate Education.

Graduate education is attracting much attention in the United States, and there is now a considerable organisation of advanced courses with a duration of from one to three years, the object of which is to prepare graduates properly for positions as specialists in practice, teaching, or research. This form of Graduate education is on different lines from that usually understood here—namely, short courses of two weeks' to three months' duration. Such courses are also carried out in America, and were attended in 1919-1920 by 6000 Graduates, many of whom were general practitioners anxious

to be brought up to date, and also by "partially prepared clinical specialists" who wish to extend or perfect their technique in general surgery or in some special line of practice.

The long course form of Graduate education is more in demand than might be anticipated: thus in 1919-1920 there were about 4000 applicants anxious to go through a course of training and work that would qualify them for (i.) some special branch of consulting practice, (ii.) public health service, or (iii.) teaching in the fundamental sciences—namely, anatomy, physiology, bio-chemistry, bacteriology, pathology, and pharmacology. The vast majority of the 4000 applicants were aiming at clinical practice.

The opportunities for these long course Graduates are described by the special committee appointed to enquire into Graduate education in America, to be "wofully lacking." The long courses vary from a year to three years in duration, and the degree of M.S. (Master of Science) or Ph.D. are obtainable: the M.S. is given, at least by some Universities, for a year's work; whereas the Ph.D. is reserved for a three years' course and for work of an exceptional character. Thus, of the 150 Fellows on the Mayo Foundation, University of Minnesota, who take a course of three years' work, about 5 per cent. obtain the Ph.D. The M.S. degree at the Mayo Foundation is given on a thesis, and during the last five years 31 have been thus awarded. The Mayo Foundation Fellows are of two kinds—(a) teaching Fellows who give 12 hours teaching a week, but receive 600, 750, and 1000 dollars during the first, second, and third years respectively; and (b) non-teaching Fellows, some of whom receive pay. The University of Pennsylvania has established a Graduate school, based on the affiliation of the Medico-Chirurgical College, the Polyclinic and a number of special hospitals, in which the degree of Master of Medical Science will be given after one year's work in Medicine, and after two years in Surgery: a further degree of Doctor of Medical Science will be given for original research, but the time period is not fixed. In the Medical School of Harvard there is a recently established course in industrial hygiene, which deals with the investigation of problems arising in connection with various industries, the work being done partly in laboratories, partly in factories. For eight months' work a certificate is given and for sixteen months' work the degree of D.P.H. This is more than a Graduate course, for it combines instruction with research.

In the Graduate School of Harvard the degree of Ph.D. is given for a minimum of two years' laboratory work of a kind to deserve this degree. The degree of D.Sc.Med. is also given for four years' work after the B.A. or B.S. degree; it is designed for laboratory workers and not for men in practice.

HUMPHRY ROLLESTON,

H. J. WARING,

8th July, 1920.

LIST OF CENTRES, UNIVERSITIES, MEDICAL SCHOOLS, AND
HOSPITALS VISITED.

CENTRES VISITED.	UNIVERSITIES AND MEDICAL SCHOOLS.	HOSPITALS.
Washington, D.C.	Army Medical School.	The Walter Reed Military Hospital.
	Naval Medical School.	Naval Hospital.
New Orleans.	Tulane University of Louisiana.	Charity Hospital. Touro Hospital.
St. Louis.	Washington University.	Barnes Hospital.
	St. Louis University.	Children's Hospital.
Iowa.	University of Iowa.	University Hospital. Children's Hospital.
Minneapolis.	University of Minnesota.	Hospital.
		St. Mary's Hospital (private), 300 beds.
Rochester, Minn.	Mayo Clinic (Graduate).	Mayo Clinic.
		St. Mary's, Worrell, and Colonial Hospitals.
Chicago.	University of Chicago (Rush Medical Coll.). University of Illinois.	Presbyterian Hospital.
		Wesley Hospital.
		Cook County Hospital.
Cincinnati.	University of Cincinnati.	General Hospital.
Cleveland.	Western Reserve University.	Lakeside Hospital.
Ann Arbor.	University of Michigan.	University Hospital.
Boston.	Harvard University.	Peter Bent Brigham Hosp.
		Massachusetts General.
		Infant's Hospital.
		Children's.
		City.
		Naval Hospital.
New York.	Columbia University. New York University. Cornell University.	Cancer Hospital.
		Presbyterian.
		Bellevue.
		Naval Hospital.
Philadelphia,	University of Pennsylvania. Jefferson Medical College. Hahnemann Medical Coll. (Homœopathic). Graduate College.	Rockefeller.
		Philadelphia Hospital.
		Jefferson Hospital.
		Hahnemann Hospital.
		Polyclinic.
Baltimore.	Johns Hopkins.	Hospital.

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