our tissues by actual or premature old age. Mistaking between the disease and its cause, they fail to observe that the former grows within us. As to drugs, the idea is very prevalent that their action represents something totally extraneous to the healthy body. We are applied to for cures, antidotes, which shall destroy and expel the intruder, exorcise the foul fiend.

A reproach constantly levelled at us is, that we possess no system. By this, I take it, the public mean some cut-and-dried series of formulæ, chiefly, if not exclusively, of theoretical origin. They seem to expect from us some thoroughgoing, all-including set of principles, elaborated in our studies, logically and harmoniously, out of our own inner consciousness. So impressed do many seem with the necessity of our fighting under some flag, that they have invented for us the term "allopathists, whatever that means. Our answer is, that we labour by the light of nature, and cannot go beyond the facts that have been discovered. Thank goodness, Medicine has done with these falsely called systems. She has suffered enough from them. Their vitality may be ascribed to two causes—the scantiness and tentative character of medical knowledge in times past, and the fact that they satisfy a craving not only in the popular, but in the medical mind itself. The strength of all depended on the tendency of most functional diseases to spontaneous recovery. Many failed to perceive this, and made the most violent and blundering assaults on their unhappy patients. Homœopathy, the "system" of the nineteenth century, is wiser in its generation; it is content to spin theories before the imagination of its believers, and to amuse the patient while the disease runs its own course. Allied to these are those waverers who have dismissed physic and its ways from their thoughts during the day of health, and who have neither firmness nor endurance to support them under suffering. They accept our services eagerly, but quickly become disheartened and wearied; they dismiss us, and run the gauntlet of the quackeries. These are the people who are said to "try" doctors and systems, who discard number one, about whom they know nothing, in favour of number two, about whom they know less.

But many men, seeing apparently the same diseases running the same course, whether under violent bleedings, heroic purgings, infinitesimal doses of nothing or coloured water, have fallen into scepticism. Nor is it to be wondered at. The answer to them is to look and inquire candidly what medicine has done and is actually doing; to put aside prejudice and weigh facts. We have no fear of the result.

Lastly, there is a large and growing section of the public who understand us, our methods, and our objects. To them we are often more than the mere administrators of medicines; we become the advisers, the comforters, the friends. They are content to accept medical science as it is, with all its shortcomings; for they know, as we know, that it is based upon truth.

ABSCESS COMMUNICATING WITH THE BLADDER AND RECTUM.—M. Duchaussey related the following interesting fact at the meeting of a medical society (*France Médicale*, No. 103). A gentleman aged 55 was suddenly taken ill during the night with excruciating pains in the abdomen, vomiting, and rigor. One physician diagnosed an attack of nephritic colic; another attributed it to gravel, but did not find any on passing a sound into the bladder. M. Duchaussey thought that there might be some obstruction in the intestine not far from the bladder, and attempted to remove it by an injection of water. Three days later, the patient passed pus with his urine and through the rectum. This showed that an abscess must have burst somewhere between the bladder and the rectum, communicating with both. Fæcal matter was passed through the bladder. Disinfecting injections of a solution of carbolic acid, etc., were daily used, and the patient bathed frequently. The inflammation was not considerable. There was myelitis, and gradually the fæces ceased to be passed through the bladder, except in particles not larger than grains of sand. The patient could take a little food, was sent to a watering-place, and soon recovered. This happened eighteen months before the case was reported. For the last three months, the communication between the bladder and rectum had been closed; the patient passed a little glairy matter from the bowels; and, two weeks ago, two pieces of fleshy matter escaped. On examining the intestines, it was found that there existed a contraction about five inches from the bladder; the mucous membrane was red and inflamed. The patient was taking twice a week an injection of two pints of water, and a small one daily. To prevent the intestine from being entirely closed, a bougie No. 30 had first been used, and afterwards an ordinary rectal bougie had been inserted into the intestine to keep it open. The cause of this affection is not clear; but in all probability it was due to some small foreign body which had in some way become imbedded into the mucous membrane, thereby causing an abscess.

REMARKS

ON

PROVINCIAL MEDICAL SCHOOLS.

BEING THE

Introductory Address delivered at the Opening of the Session 1879-80, at the Queen's College, Birmingham.

By JAMES SAWYER, M.D.Lond., M.R.C.P.,

Physician to the Queen's Hospital; Professor of Materia Medica and Therapeutics in Queen's College, Birmingham; etc.

It is my duty to-day, when we inaugurate the opening of another academical year, as the representative of the Council and Professors of the College, to address a few words to our old and new pupils in the faculty of medicine. My first words shall be words of welcome. In the name of those who have honoured me by their confidence and on whose behalf I am privileged to speak, I offer a cordial welcome to every student in this theatre. Some of you are here for the first time; perhaps some of you are proud to count the opening session as the last of your collegiate curriculum; most of you return to work in which you have already made considerable progress. I hope you all come with a due and deep sense of the responsibilities you are undertaking. I hope you are all filled with an earnest determination to avail yourselves to the utmost of the great opportunities which are given to you for learning the principles and practice of our profession—opportunities greater, perhaps, than you are able now to esteem them; greater certainly than many of your predecessors have enjoyed.

All of us may justly be proud of the prosperity and promise of the Birmingham Medical School. For many years, its progress has been steady and uninterrupted. Founded more than half a century ago by my late master, Mr. Sands Cox, whose name can never be mentioned within these walls, which he loved so well, without respect, who opened his lecture-rooms in Snow Hill in 1828, our school has had a memorable and chequered, and yet a honourable, history. Memorable is that history—in that its earlier records register the marvellous success attained by the devoted and unwearied enthusiasm of a very remarkable man. Chequered, alas! has that history been by petty jealousies and administrative disaster—blots which a later and enlightened harmony long since has swept away, I hope, for ever. But honourable withal does that history seem when we remember the self-sacrificing zeal of a goodly succession of teachers, not a few of whom have ranked with the brightest and best in our profession; and honourable, too, is our history when we recall a roll of students inscribed by some who have proudly borne the name of our school through the honours lists of colleges and universities, and won their way to the highest eminence in science and in medicine.

Since I first knew the Birmingham Medical School, some important and most beneficial changes have been made in its constitution. We no longer see the General Hospital with its little college and the Queen's College with its little hospital forming two distinct medical schools, weakening each other by their rivalry, and dividing the teachers of the town and the students they could attract in ever-varying proportions. First, the two colleges became united. The Queen's College of to-day represents the rival Queen's and Sydenham Colleges of a dozen years ago, and still numbers, I rejoice to say, amongst its senior professors several of the teachers of the older schools. This happy fusion, which promises to be indissoluble, was followed by another, and, to my mind, more important, union. Seven years ago, the General and Queen's Hospitals, still competing clinical schools, although each was working in conjunction with the united college, became formally associated for the joint practical instruction of students. This co-operation of the two great hospitals of the town—the complement of the amalgamation of the colleges, and without which that amalgamation could scarcely be expected to be permanent—conceived and completed, not without some individual sacrifices, for the welfare of the pupils of the school, has more than realised the sanguine expectations of its promoters. I hope and believe this union will be lasting. You have now the privilege of watching and sharing in the practice of twenty-two hospital physicians and surgeons, who are responsible for the charge of nearly four hundred beds and the yearly care of four thousand in-patients and forty thousand out-patients. You have the advantages of the services of a staff of clinical teachers and the experience of a *clientèle* surpassed in number

and extent in only a small minority of the metropolitan schools, and unequalled elsewhere in England. To-day, then, we see the Birmingham Medical School firmly constituted by a happy union of the leading medical and teaching bodies of the town. The General and the Queen's Hospitals, formally sharing the clinical training of our pupils, are linked to the Queen's College to form one school. A liberal and enlightened policy has brought into harmonious association three great kindred institutions for a high and common object; and it has wisely so united them that they are associated only and not amalgamated, each maintaining its own administrative independence, each preserving full scope for the separate development of its own resources and work, and each reciprocally extending the influence and usefulness of the others. I hope this good genius of co-operation will one day consolidate together and bring into our school all the teaching strength and all the clinical material of this great town, so that your opportunities for obtaining a sound practical knowledge of your profession may be further extended in our Eye and Children's Hospitals, and in our important asylum for the insane.

To train medical students to become medical practitioners, and to pass certain examinations which are the legal tests of their fitness to practise, are the functions of a medical school. The former function, the higher of the two, although you may not now so estimate it, can be measured by no easily defined standard; but it embraces many subtle and most powerful agencies—what may be called the “tone” and “surroundings” of the school and the moral influence, example, and personal qualities of its teachers. But the way in which a medical school fulfils its second function, that of fitting students to pass the qualifying examinations, can be readily tested. The Royal College of Surgeons of England is the body from which most of the medical students of England obtain the right to practise as surgeons. The Council of that College has published some interesting and important statistics of its examinations. If we examine the last published of these statistics, showing the absolute and relative numbers of students who have passed or who have been rejected from each medical school, for the primary and pass examinations for the diploma of member of the College, during the academical year 1878-79, we shall see that the teachers and pupils of the Birmingham School have abundant reason to be proud of their work. Taking the primary examination, and comparing the results therein attained by our own school with those of the eleven schools of London, and also with those of the seven English provincial schools other than our own, I find that the highest metropolitan percentage of rejections is 48.5; the lowest, 18 per cent. The average of the rejections from the medical schools of London is 30.3 per cent. For the same examination, the percentage of rejections from the Birmingham School is only 15.7; less than a third of the largest and worst metropolitan percentage, a very little more than half the average of the London schools, and 2.3 per cent. lower and better than the lowest and best percentage attained by any London school. For this examination, too, the worst English provincial percentage of rejections is 48.75; the average is 32.3 per cent.; the best is that of the Birmingham School, namely, 15.7 per cent.; not half the average. An examination of the statistics of the pass examination is scarcely less satisfactory. The highest metropolitan percentage of rejections is 38.3; the lowest, 23 per cent. The average of the rejections from the schools of London is 31.3 per cent. For the same examination, the percentage of rejections from the Birmingham School is only 17.5 per cent.; 13.8 per cent. below the metropolitan average, and 5.5 per cent. lower and better than the lowest and best percentage attained by a London school. For this examination, the worst English provincial percentage of rejections is 53.3; the average is 35.6 per cent.; the best is that of the Birmingham School, namely, 17.5 per cent.; again, not half the average. Comment on these facts is unnecessary. They show, among other things, that excellency in these matters does not altogether depend, as some would seem to think, upon geographical conditions.

Now that I have given you some account of the position and progress of the Birmingham Medical School, I purpose to make a few brief suggestions to our students concerning the conduct and character of their studies. But before I pass on to the second part of my theme, I would notice, in passing, a question which for medical men and medical students is now a “burning question”. Let us hope we are now on the eve of important changes in the method and management of the examinations of the licensing bodies, notwithstanding the lamentable indifference of the Government, the selfish and short-sighted opposition of the Scotch universities and colleges, and the amazing stupidity of the Medical Council. If I mistake not, the general voice of the profession demands that the constitution of the Medical Council be recast, that that august body develop into something more than a debating society, that its functions be forthwith quickened so that it may at last, after a hibernation of twenty-one years, do something

to guard the rights and regulate the responsibilities of medical practitioners, and that what are called the “portals” of the profession be consolidated—we want fewer doors and more windows. The absurd multiplication of licensing bodies in the United Kingdom, and, in many of these the undue multiplication of licences, the great differences which have existed in the length and character of the curricula and in the number and stringency of the examinations of the various corporations, combined with the fussy inactivity of the Medical Council, have long afflicted medical students, and the profession generally, no less than the outside public, with evils whose harm it would be as difficult to measure as to exaggerate. There is not now before you, unfortunately, a definite set of examinations which you cannot shirk, if you would, if you would enter our profession, and in preparation for which you must regulate and direct your various studies in due order as to extent, proportion, and succession; but you are bewildered by the choice of “portals”, which make unequal demands upon your time, your energies and your pockets, determine in varying degrees your subsequent professional status, fit or unfit you for the highest or lowest professional offices, and some of them so accommodating that you may look forward to entering them if in the end you should fail to pass or fear to approach their more exacting rivals. Can we wonder at the confused notions which possess the public as to what is connoted by a qualification to practise? At this moment, in the United Kingdom alone, without counting the newly-fledged Victoria University, which I understand has not yet formulated the arrangements of its medical faculty, there are no fewer than nineteen corporations chartered to confer medical degrees and diplomas. And such is the activity of these bodies that, exclusive of certificates in obstetrics, sanitary science, and dental surgery, in London there are given eleven, in the provinces of England ten, in Scotland nineteen, and in Ireland thirteen medical qualifications, a grand total of fifty-three licences to practise, the possession of any one of which entitles its holder to registration and the exercise of the privileges of a medical practitioner. Surely we have borne these evils long enough. Surely it is incumbent upon every member of our profession to do his best to secure their removal. All honour to those who have so long worked amongst us, in spite of official discountenance and delay, to effect a reform which cannot now be distant. Let us hope we shall soon see the Medical Council reconstituted with fuller powers upon a broader and a juster basis, including representatives of our medical schools and of the profession generally as well as of the corporations, framing rules for examinations, and enforcing punishment on those who practise without authority or unworthily, and the universities and colleges of the land—still preserving their powers for supplementary admission to the higher professional qualifications—united in a real conjoint scheme, providing a well-balanced minimum standard of examination for a licence to practise, uniform as to curricula, stringency and fees, in all divisions of the kingdom.

[Dr. Sawyer then spoke of the various subjects of the medical curriculum, of each of which he urged upon the students an earnest study and practice. Each of these subjects is a science, and has its cognate art. The relationships of medical science and its art were discussed; and the four methods of study, attendance upon lectures, and upon the demonstrations of tutors, the reading of systematic treatises, and the practical work in the dissecting-room, wards, and mortuaries, were enumerated. Above all, the study of anatomy, “the very corner-stone of the medical sciences”, must be accomplished; whilst chemistry and physiology cannot be ignored. The students were to be diligent attendants upon hospital practice; and the time before them was all too short for its purpose. They had dresserships and clerkships to hold; they must teach their own fingers to feel, their own ears to hear, and their own eyes to see in their clinical work at the bedside of the sick and suffering. The lecturer then concluded as follows:—]

I hope a genuine and unalterable love of science, a humane and abiding enthusiasm, and an honest desire to earn your bread in the work of an honourable profession are chief among the feelings which have guided the choice that brings you here to-day. Remember, you have chosen a calling carrying with its practice responsibilities which are often more pressing, more personal, more direct, and more undivided than attach to the pursuit of any other profession. If you would duly fit yourselves now for these responsibilities, which must come upon you hereafter when you pass into practice, you will seriously and constantly strive to make the most of your educational opportunities for the acquirement of professional knowledge and professional skill. But howsoever extended your knowledge, howsoever great your skill, you cannot discharge these responsibilities aright unless you continue to train your hearts in courage and your minds to pure and lofty purpose. Bearing your responsibilities manfully, I would that you should pass from this school with a due sense of the dignity and worth of your calling; not

with a contracted and contemptible class conceit, but with broad human sympathies, tempered with that just professional pride which is one of the strongest incentives to sacrifice for any work which tends to foster professional unity or to raise our calling in public usefulness or esteem. Such a professional pride is the surest safeguard of professional probity.

NEW INVESTIGATIONS ON THE FURTHEST LIMITS OF COLOUR-PERCEPTION BY DIRECT SUNLIGHT AND BY ELECTRIC LIGHT.*

BY PROFESSOR HERMANN COHN, Breslau.

THE distance at which the colours of different coloured papers can be recognised has not as yet been unanimously decided. Donders has said that, by good daylight, papers of 1 millimètre square in each colour can be recognised at 5 mètres distance. For 5 mètres, Dor and Weber found 2 millimètres for green, and 3 millimètres for red, as the diameter of the circle necessary for recognition of its colour. For yellow, Dor gives 2½ millimètres; Weber 5 millimètres; for blue, Dor 8 millimètres; Weber 5 millimètres.

In order to ascertain the extreme distances for perception of colour by the best illumination, I tested by the electric light the eyes of some physiologists who possessed normal acuteness of vision; and I found at my first experiments, by aid of Weber's chromometer, that many people recognised colours three or four times further off than Weber had calculated for daylight (see *Archiv für Augenheilkunde*, Band viii, Heft 3, p. 408).

What was my astonishment, however, when, with arrangements specially made for this purpose, I found that the largest room in the Physiological Laboratory was not long enough. The doors of a number of adjoining rooms had to be opened, in order to give a space of thirty mètres in length, to find the extreme boundaries for the recognition of coloured points of from one to two millimètres diameter upon a dark background.

I used the Heidelberg flower-paper which Weber employs in his chromometer, cut in bits of one millimètre square, and fastened each on a large surface of black velvet. The electric light was produced by a gramme machine of three-horse power and one hundred rotations in the minute, and was placed in front of the visual object at a distance of one mètre. The medical men and physiologists who were examined looked through a Weber's tube, in order to keep off all lateral light, which, however, was but weak, as the experiments used to be made from nine to eleven in the evening. The eyes examined were either emmetropic or slightly myopic (0.5 to 1.0), and in the latter case were corrected with concave glasses. Each eye was tested separately, and the following results were obtained with papers of one millimètre square.

1. Red appeared bright at from 16 to 17 mètres distance; distinctly red at from 11½ to 15 mètres.
2. Green appeared bright at from 20 to 24 mètres; distinctly green at from 8 to 14 mètres.
3. Blue appeared bright at from 8 to 10 mètres; but not distinctly blue beyond 2, 4, or 8 mètres.
4. Yellow appeared bright at from 15 to 20 mètres; but not distinctly yellow until at from 1 to 6 mètres: up to that point, there was always great hesitation as to whether the object was white or yellow.
5. White appeared bright at 20 mètres. At from 16 to 20 mètres, it was usually recognised as white; but yet often mistaken for yellow up to 6 mètres distance.
6. Orange appeared bright at 24 to 25 mètres; reddish at 13 to 15 mètres; reddish or yellowish at 8 or 9 mètres; not distinctly orange until from 3 to 7 mètres.
7. Violet caused the most difficulty. It appeared first as a bright point on a dark ground at from 11 to 13 mètres. Only at from 1 to 4 mètres was it seen as violet or blue.

It was now important to make similar tests with the same papers by direct sunlight in the open air. So far, such measurements are wholly wanting. In the garden, on sunny days, between 9 and 11 o'clock in the forenoon, eleven eyes were examined. The coloured papers, fastened on black velvet, were placed in the direct sunlight, while the individual under examination stood in shadow and looked through a Weber's tube.

1. Red was recognised certainly as red at from 10 to 17 mètres; exceptionally at 19 to 22 mètres; but was seen as a bright point at 20 to 22 mètres.

2. Green was seen certainly as green at 4 to 11 mètres; exceptionally at 21 mètres; at 22 to 32 mètres, it was seen as a bright point; at 12 to 18 mètres, usually as bluish or whitish.

3. Blue was seen certainly as blue at 4 to 9 mètres; exceptionally at 11 to 17 mètres; often mistaken for green at from 8 to 14 mètres; seen as a bright point at 14 to 22 mètres.

4. Yellow appeared at 35 to 40 mètres as a bright spot; but no one could say whether it was yellow or white. It was seen as yellow at 3 to 9 mètres; occasionally at 17 to 22 mètres.

5. White appeared as a bright spot at from 22 to 27 mètres distance; but here also it often could not be said with certainty whether it was white or yellow until the distance of 2 or 3 mètres had been reached.

6. Orange was seen at from 21 to 36 mètres as a bright point; at 17 to 20 mètres, usually as reddish; usually as orange at 5 to 8 mètres; often, however, not until 2 mètres was reached; and rarely at 16 to 22 mètres.

7. Violet was seen as a bright point at 19 to 22 mètres; then as grey-red, whitish, orange, sometimes white, and not certainly as violet until 1 to 3 mètres distance had been reached. One medical man recognised it as violet at 7 and 14 mètres.

These observations show that the boundaries for most colour-perceptions have hitherto been calculated too low. For the very variable diffused daylight, the numbers given by Donders, Dor, and Weber may perhaps be admitted.

On an average, colours of 1 millimètre in diameter will be seen—

	By Direct Sunlight.	By Electric Light.
Red....	At 14 mètres.	At 13 mètres.
Green..	At 7 mètres, further off mistaken for blue.	At 11 mètres, further off mistaken for blue.
Blue...	At 7 mètres, further off mistaken for green.	At 6 mètres, further off mistaken for green.
Yellow..	At 6 mètres, not distinguishable from white.	At 3 mètres, not distinguishable from white.
White..	At 30 mètres, not distinguishable from yellow.	At 18 mètres, not distinguishable from yellow.
Orange..	At 5 mètres.	At 5 mètres.
Violet..	At 2 mètres.	At 2 mètres.

I am now engaged in investigating the question of increase of the distance for recognition of a colour with increased diameter of the visual object.

ON EXAMINATION FOR COLOUR-BLINDNESS.*

By H. R. SWANZY, F.R.C.S.I.,

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THE subject of congenital colour-blindness has for the last two years occupied much of the attention of ophthalmologists in Germany, in Norway and Sweden, and also in America. In Great Britain and Ireland, however, it has not been investigated with that thoroughness which its physiological interest and practical importance demand. It is true that to the writings of three Englishmen we are indebted for some of the earliest investigations concerning the chromatic sense and colour-blindness, namely, Young, Dalton, and Wilson of Edinburgh; but since their days the subject has not been cultivated by us. I desire briefly to bring under the notice of the Section some of the methods for examining the colour-sense which are now in use, and some of the observations which have been made as to the frequency of this anomaly.

Before doing so, permit me, sir, to refer to the two great rival theories of colour perception at present existing. The older of these is known by the names of two great men, as the Young-Helmholtz theory. It assumes three kinds of elements in the retina for perceiving respectively red, green, and blue (or violet). In accordance with this theory, three different kinds of colour-blindness are recognised, red-blindness, green-blindness, and blue-blindness. The Young-Helmholtz theory is still held by some as the true one; but a large proportion of those competent to form an opinion, and who have carefully investigated the question, have adopted the theory of the colour-sense as propounded by Professor Hering of Prague in his paper laid before the Vienna Academy on May 15th, 1874. According to Hering, there exist in the retina three kinds of perceptive substance: 1. The substance which perceives the

* Read in the Subsection of Ophthalmology at the Annual Meeting of the British Medical Association in Cork, August 1879.

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