mental impressions exert an influence over the glands concerned in digestion—from the salivary down to the glands of Lieberkühn in the caecum and appendix. The mental influence is such that when the mind is engrossed in other affairs than the taking of food, those gland secretions are apt to be scanty and indigestion is apt to follow. If a person is mentally engrossed he ought to refrain from eating, or eat very sparingly.

The standing lunch, eaten against time, while the mind is fully occupied with business or professional examinations—the food, instead of being chewed and mixed with saliva, being simply washed down as a bolus with some fluid—is one of the best ways of not only producing indigestion, but of ultimately causing caecal and appendicular mischief. Man has neither a crop like a bird nor a caecum like a horse, and, therefore, he has no provision for bolted food. One has heard of children being forced to take foods which they dislike because “it was good for them.” The digestive juices will not flow under these circumstances. The brain of children is so often burdened with “tasks” committed to memory and engrossed with educational enigmas that there is no time for digestion. Mastication is not taught in schools, digestion has no place in national education, and there are no certificates given for sound digestion, but we appoint Royal Commissions to inquire into the causes of the physical deterioration of the race.

Although the caecum aids in digestion it does so by receiving partially-digested food which contains the proper amount of secretions from other glands. It does compensate somewhat for their defects, but cannot do so entirely.

Therefore it is a matter of great moment to commence the digestive process well. A free mind, with the prospect of enjoyment of food, thorough mastication until the saliva is efficiently mixed with the food, and then the process of gastric digestion will have a good beginning, and the food thus prepared will be received in due course with abundant digestive juices in the other parts of the canal.

At a consultation on one occasion, the lady of the house (French by origin), who was not a patient, being in perfect health, twitted the local Scotch doctor with the rainy weather they kept in Scotland. He replied: “But, my lady, it seems to suit you, as you are always in good health.” “Yes,” she said, “thanks to you, doctor; you always keep me in good health.” The doctor laughed, and explained that the lady always asked for advice, but never took the medicine. The lady said that at least she always had the prescription made up. That it was the same wherever she went—London, Paris, or elsewhere; she consulted the best authorities, and had a general chat with them about her condition, and how best to maintain health, and, when they were good enough to give her a prescription, she had it made up and dated, and placed both prescription and drug in a cabinet made for the purpose. “But,” she added, “indeed, I have never been ill. I believe the greater number of maladies arise from indigestion, and that indigestion occurs mainly from too fast eating; whereas I eat slowly, and many times I am ashamed, as I am the last to put down my fork.” There was a method in that lady’s madness.

For many years I have believed that the human caecum and appendix are of value in digestion. The facts pointing in that direction have accumulated slowly, and are not all garnered; many require still to be investigated. One would have preferred to have waited until they were gone over again, re-tested, and either verified or dropped out. But “Art is so long” that I have ventured to present you with an unfinished picture, which I hope some of you will be able to correct and finish. What has been said is merely a contribution to the subject. In dealing with it in the future remember what Huxley says: “Let us sit down before fact as a little child, be prepared to give up every pre-conceived notion, and to follow humbly wherever Nature may lead.”

REFERENCES.

Lectures by Professor Pawlow. Translated by W. H. Thompson. Charles Griffith and Co. London: 1902. D. M. Smith, *The Physiology of the Domestic Animals*. Philadelphia: 1889.

An Address

ON

THE FUTURE RELATION OF KING'S COLLEGE TO ITS MEDICAL SCHOOL AND HOSPITAL.

Delivered at King's College at the Opening of the Medical Session on October 4th, 1904.

By THOMAS BUZZARD, M.D., F.R.C.P.,

Consulting Physician, National Hospital for the Paralysed and Epileptic Queen Square; Member of the Senate of the University of London; Fellow and Member of the Council of King's College.

BEFORE proceeding to address you on the subject of the future relation of King's College to its Medical School and Hospital I should like to say a few words on the more general topic of the medical life and practice. And first let me congratulate the students who have been winners in the competition for the highest distinctions awarded in the Medical Department, and have received to-day the welcome recognition of their industry and ability. There is no need for me to enlarge upon this theme. The legitimate satisfaction at their success which they must feel is far and away more grateful to them than would be any words of mine. But I should like to remind those of my hearers who have industriously competed without in the end finding a place in the list of the more fortunate recipients that they cannot be described as “losers.” They are simply “non-winners,” and, indeed, so far from having lost anything, it is certain that they have gained very much, for the time expended in working cannot but be attended with infinite advantage to themselves. It has been wisely said: “The reward is in the race we run, not in the prize.” Nothing can deprive them of the precious service to their own mental development rendered by their hours of industrious occupation, and the last thing they would need or desire from us would be any expression of condolence.

It would be a truism to say that the medical students of this College are on the threshold of an honourable profession. Speaking as one who has been a member of it for very many years, I should like to say, for their encouragement, that I believe they have chosen well. They will have the opportunity of living the fullest, and it will be their own fault if it is not the most useful, of lives. What better has existence to offer than this? I took my place as a first year's student in this College on the occasion of an introductory address by the late Dr. Todd, and of all the many sentences which fell from his silver tongue there is but one which I now remember (and that was a quotation): “To scorn delights and live laborious days”; and the words were applied, of course, to a medical career. The aptness of the latter part of the quotation cannot be denied. There is probably no more laborious life than that of a medical man, and, doubtless, in the sense in which the words were employed by the poet (as will be acknowledged by those who remember the context), the former half is also true. But I am ready to assert with confidence that in no walk of life can the highest forms of delight—those which belong to the acquisition of knowledge, and those which never fail to attend the faithful performance of duty—be looked for and found more certainly than in that upon which many of those before me are now entering. Did time permit, I would gladly pursue this general topic—one upon which the experience of a long and active professional life probably gives me some authority to dwell. But I will content myself with saying a few words upon a practical point which may, perhaps, prove useful to some of those whom I am addressing.

I would earnestly counsel all those who have the opportunity—and there must be very few who have not—to aim at the highest; not to be satisfied, I mean, with that qualification for practice which is most easily obtained. Addressing as I am an assembly of medical students the majority of whom are probably intending to enter family practice, I would point out to them that in these days graduation at a university is in the air. The times have passed when it was only necessary in our profession for the consulting physician to obtain a degree. In such greater numbers every day are family practitioners adopting this course that one need not be possessed of any gift of prophecy to say that in a few years those who are without a good medical degree will lag behind in the race for success, and still more so for distinction. As

ACCORDING to American medical journals, Dr. W. L. Smith, of Boston, who was travelling for pleasure, was recently detained at Ispahan during an outbreak of plague. During his detention he treated the natives with success. The Shah, who was suffering from malaria, sent for Dr. Smith and has now, it is said, appointed him his physician in ordinary.

is well known, Cambridge and Oxford are attracting large and increasing numbers. The more recently founded and important universities in the northern counties of England are providing admirable facilities for students coming from the provinces. London, however, with its unrivalled resources for clinical teaching and experience, must in the future become more and more the most esteemed centre of all for the acquisition of medical knowledge. In its lately-developed form the University of London is, if I am not mistaken, certainly coming to occupy the highest place in the education of the medical profession. The well-recognized esteem in which its medical degrees have always been held has suffered no diminution since the change in its constitution, whilst the direct representation on its Senate of all the most important colleges and public bodies in London has vastly increased and extended its influence upon education. I should certainly advise every student I am addressing to aim at obtaining a degree in the Faculty of Medicine of the University of London. As I said before, graduation is in the air. The time is rapidly coming when members of all professions will naturally be expected to hold a university degree. It is not so many years since it was a rare exception for a solicitor to have graduated at a university, and as for the engineer or the architect they were practically never seen in the ranks of university graduates. All this, as we well know, is changing daily. Even in the military profession graduation is asserting its influence, and the Army Council is arranging with the universities to carry on military education during the undergraduate period, granting a commission upon examination to selected candidates when the degree has been taken, and antedating it by a twelvemonth to the recipient of honours. I say that you cannot afford to lose the opportunity which you now enjoy of taking a London degree. I daresay that it will appear to some of you impossible that you can ever require it. That is what you cannot possibly foresee. I have the best of reasons for knowing that the possession of the London degree may make a vital difference in the whole career of him who holds it.

Nor is the advantage of it at all confined to consultants. I was consulting a few weeks ago with a very able practitioner of medicine in one of the London suburbs, and observing that he held the M.D. Lond. degree, I asked him if he thought that this had made any difference to him. He did not hesitate, but said that it had made all the difference in the world to him. He was junior partner in a firm of three, of which the two others were also graduates of London, and he would not have been permitted to join them but for his possession of a London degree. He told me also that in his experience the public were steadily learning to appreciate the value of these degrees. Nor are there wanting signs that the State is likely in the future to avail itself more and more of the services of high-class members of our profession in public duties, especially perhaps in the investigation of causes of disease in various parts of our world-wide empire, and in the organization of measures for their prevention and treatment. For such appointments the mark of higher education furnished by the possession of a London degree cannot fail to be of great value.

I would remind those now entering that the curriculum is of the same length—five years—both for a London degree and the diploma of the Conjoint Board. Let them try, if they will, for both. That they will have to work extremely hard there is no doubt. So much the better. I feel inclined to repeat what President Roosevelt says in one of his addresses, "Your work is hard. Do you suppose I mention that because I pity you? No, not a bit. I don't pity any man who does hard work worth doing."

Are the London degrees obtained with any more ease than was formerly the case? I do not think so. Perhaps the larger choice of subjects in the Matriculation Examination may facilitate matters a little. A little grace, too, is given in another direction. In the General Preliminary Scientific Examination a student may be examined in each of the three subjects separately. Students who have failed in one or more subjects of the examination may offer themselves for re-examination in these subjects, either separately or together, at any subsequent examination. And in the General Intermediate Examination in Medicine students who have failed in one subject only may offer themselves for re-examination in this subject, if permitted to do so by the examiners. Personally I should be inclined to extend such facilities, and favour the candidate being allowed to take his subjects in a somewhat piecemeal fashion. It is amusing to see a juggler

keep half a dozen balls in the air at the same time, but there is no particular use in the achievement. The necessity of passing in several subjects on one and the same occasion disposes, I think, to cramming, and, in my judgement, should be discountenanced. However this may be, it may be taken that the London degrees are at least as valuable as they ever were, and no less difficult to obtain. Can it be doubted that a student should strain every nerve to obtain such a distinction? It has been remarked that a severe examination always excludes fools and sometimes persons of genius. Let me commend the consideration of the latter alternative to those who have the misfortune to fail.

Let me now turn to the important subject upon which I have promised to say a few words. It will be readily understood that the approaching removal of our hospital to Camberwell has necessitated the most careful and anxious consideration of the relations which should subsist in the future between the College and its Medical School. The disadvantage which has always to some extent been felt in the past from the circumstance that the School and the Hospital were not under the same roof (as is almost invariably the case with the medical schools generally) would naturally be much intensified by the greatly increased distance between them, unless measures could be taken to obviate the difficulty. It was at once evident that with a distance of nearly four miles between the College and the new hospital, continuance of the Medical School on existing lines was not practicable. In certain respects, too, it must be remembered the step we are about to take is unexampled in the medical history of the metropolis. It is true that hospitals without medical schools have before now been transferred successfully to new sites. And we also have the example (I think a solitary one) of St. Thomas's Hospital (possessing, as we all know, a very important medical school), which was removed from the Borough to its present position in Lambeth, after a temporary sojourn in the Surrey Gardens at Walworth. In that instance, the school, along with the hospital, was successfully removed, and possibly there are those who would say that there is no reason why we should not simply imitate the example which has thus been set. I think I can show you why this is out of the question. In the first place, since the old days when St. Thomas's was leaving the Borough, some forty or more years ago, a great change has come over the academical arrangements for the education of the medical student. At that time (and I am speaking of things within my personal knowledge) the old idea of "walking the hospitals," as representing the first step to be taken in medical education, had not altogether died out, and the notion that the student ought to prepare himself, by some years of scientific study, to profit by the opportunities of clinical experience at the hospital had not advanced into practical working. Accordingly the student of medicine entered the wards of the hospital on the day that he joined a medical school. In some cases this would be only a month or two after he had ceased to be a schoolboy. In many instances he would have passed some years as an apprentice dispensing his master's prescriptions. The expression, "preliminary and intermediate studies," was then unknown. In these days, as is well known to the teachers though the fact may not be widely recognized by the public, the student does not, or ought not to, make his appearance in the wards of the hospital until he has been studying for some two years or more, and has passed examinations in a number of scientific subjects. Sometimes, it is true, he may put in a little work as an out-patient dresser or clerk. But this, I understand, is rapidly becoming a thing of the past, and his appearance in the hospital itself in the earlier half of his education is now in some institutions forbidden, and in all discouraged. For that reason alone the removal of our Medical School to Camberwell, so far as the preliminary and intermediate studies are concerned, with the necessary vast expenditure which would have to be incurred in connexion with lecture rooms, apparatus, laboratories, etc., would clearly be motiveless; it will not bear a moment's contemplation.

But there is also another and a yet more convincing reason. King's College, on account of its Science Faculty and because of its recognition by the University of London as a complete Collegiate Institution, must, in any event, still retain the teaching of these purely scientific subjects, and it is in the College itself, and not in the hospital, that they must be taught. It must be remembered that this is not simply a question of a hospital, linked on to which is a school of such scientific subjects (and those only) as concern the medical student. King's College is an institution which may be

described as of university character. It possesses Faculties of Theology, Arts, Science, Engineering and Applied Sciences, and Medicine, besides having a Women's Department and a Boys' School. A very large and important professorial staff has to be maintained for the service of the various faculties, and the medical student who enters here has the great advantage of sitting under professors whose business in life it is to teach the particular subjects in which their eminence is acknowledged. The only other institution in the metropolis with which it is comparable is University College. These two Colleges are described in the University of London Statutes as "Schools of the University in all the Faculties in which they respectively afford instruction." The medical schools of the metropolis generally are designated "Schools in the Faculty of Medicine."

There is no necessary obligation for the Schools in the Faculty of Medicine to concern themselves with the teaching of the preliminary and intermediate studies. It is notorious that the burden of provision for the teaching of such subjects has often been, and is now in many instances, a grievous one. There has never been any financial advantage in it. On the contrary, it signifies a constant outlay upon the various requirements for the exposition of the subjects, and this, with the progress of science, is becoming and cannot fail still to become a more and more serious demand. It means the absorption of space which would be of the greatest possible value in supplying the needs for properly teaching the essentially hospital studies. In means that very often a man whose abilities lie in the direction of medicine and surgery rather than in that of pure science, and who is conscientious in his work, spends a large amount of time in cultivating his knowledge of and teaching a subject the pursuit of which, whilst it is of no use whatever to him, probably displaces research in another direction which might be of great service to the science or art of his profession. How much better it would be if this work were undertaken by those who have made the study of these sciences their life-work and the teaching of them their profession.

It is easy to understand how the medical schools have almost insensibly piled up on their shoulders the burthen under which many now groan. The task of supplying such requirements in the old days was not a very severe one. But year by year the difficulty has increased, until it has become insupportable. The process, no doubt, has been a very gradual one, and in the earlier days, indeed, the idea of obtaining elsewhere than in the hospital the necessary teaching of more or less preliminary subjects did not enter into consideration. A young man entered at one of the hospitals and found there, as he expected, all that he needed for each step in the process necessary for acquiring a degree or diploma. The idea of going outside the hospital for any part of his education was practically never entertained.

All that is now changed. The student of medicine may obtain, and as a matter of fact frequently does obtain, the teaching of such subjects as chemistry, physics, and biology where he likes, so long only as he conforms to the regulations of the examining body by which his knowledge is to be tested. It is also notorious that the large majority of the students who pass their examinations in the early studies at Cambridge or Oxford, up to and including anatomy and physiology, come to London for their hospital studies, and enter at any hospital they may choose to select. The idea that the student should necessarily carry out his "hospital studies" at Oxford or Cambridge is never contemplated.

In the case of the many London students who do not go to the older universities, and whose aim it is to obtain a degree at the University of London or the diploma of the Conjoint Board, it is evident that King's College has peculiar advantages to offer as a school for the preliminary and intermediate studies. Owing to its constitution as a complete collegiate institution it is necessarily riquipped in its Science Faculty with all the requisites for education in the purely scientific subjects—those studies which have to be completed before the student need determine at which hospital he will enter to carry out his advanced or hospital studies. How to extend these advantages and turn them to the best account in the new departure in which we are engaged has occupied the very earnest consideration of the Council, in which it has received most valuable help from the professorial staff of the Medical Department.

It has appeared to us probable that some of the medical schools of the metropolis who wish to rid themselves of the incubus of providing education in the preliminary and intermediate studies (which, as I have said, is really no necessary

part of the work of a medical school) might be glad to come to some mutual arrangement by which King's College would carry out this portion of the curriculum in its Science Faculty, leaving the student free at its close to complete his education by pursuing the advanced studies elsewhere. So long as King's College continued, as in the past, to receive practically only those students who intended to carry out their whole professional education under its wing, it would, I need scarcely say, have been useless to expect that other schools would send their students to it for the early studies. In our new departure it is recognized that King's College, by the peculiarity of its constitution, has probably an increasingly important part to play in the education of the student in the early studies, provided that the interests of the other medical schools are properly safeguarded. Surely this should not be beyond the reach of arrangement.

I believe I am correct in stating that University College is proceeding on similar lines. By a curious coincidence the two first Colleges of the University of London—University and King's—find themselves simultaneously—the former by its forthcoming incorporation with the University, the latter by the impending removal of its hospital to Camberwell—in an unusually favourable position for completely separating the department for the later medical studies from that which is concerned only with the preliminary and intermediate subjects. In each case the arrangements for teaching these latter will be so ordered that they will be able to be made use of by as many of the other schools as may desire to do so consistent with the amount of accommodation they are in a position to afford. The Institute of Medical Sciences projected by the Senate of the University will provide, in process of time, and when the very large amount of funds requisite for the purpose are obtained, a third centre of the kind.

It has recently been suggested by a very eminent authority that a centre for the preliminary and intermediate studies would be necessary on the south side of the Thames. I confess that I am quite unable to agree with him as to this requirement.

These earlier studies are acknowledged to be independent of hospital association—witness the number of students who obtain their teaching in them at Oxford and Cambridge. The mere circumstance, therefore, that there will presently be three large general hospitals on the other side of the Thames can have no possible bearing on the matter. Surely the more central and easily accessible the place for these studies the better. The very large cost, too, of founding such an institution would be a most serious objection even if the scheme were otherwise desirable.

Without venturing to enter upon details, the consideration of which would be evidently premature at this moment, and might possibly be misleading, I think I may sketch very broadly for your information and interest what is proposed to be done by King's College.

In the first place, except as regards the name, there will be a complete and entire separation of the Hospital from the College. It is desired that, as far as possible, this separation should take effect at an early date. Accommodation will not be provided at the new hospital for any of the preliminary subjects, including under this head physics, chemistry, zoology, botany, anatomy, physiology, materia medica, and pharmacology. These subjects will all be dealt with at the College, as indeed they are at the present time. With the exception of anatomy, materia medica, and pharmacology, the subjects in question already form part of our Science Faculty, and could not therefore be removed from the College, even were it desirable. Anatomy will be retained as a preliminary subject at the College, where adequate accommodation is provided, and it will be transferred from the Faculty of Medicine to that of Science. Physiology, practical physiology and histology, together with experimental psychology, will continue to be taught at the College, in the Faculty of Science. The laboratories of experimental pathology and also of neuro-pathology cannot conveniently be transferred to the new hospital, for the Council and hospital staff are agreed that original researches in these subjects, which may involve experiments on living animals, shall find no place within its walls. The teaching of State medicine will be continued in the College.

Accommodation will be provided at the new hospital for teaching each and all of the following subjects:—Medicine (including advanced therapeutics, diseases of children, and psychological medicine), surgery (including operative surgery and surgical anatomy), obstetric medicine and gynaecology, pathology (including general pathology, bacteriology, patho-

logical anatomy, and clinical pathology), forensic medicine (including toxicology), hygiene (by lectures only), the more special clinical subjects (including ophthalmology, otology, laryngology, rhinology, dermatology, odontology), the administration of anaesthetics, orthopaedics, x-ray and cognate work. It is intended that opportunity should be provided for the study of operative surgery at the College as well as at the Hospital. General pathology and bacteriology will be carried on at the Hospital as well as at the College under conditions which are not yet quite determined. Such is a brief statement of the arrangements for teaching which are in contemplation.

In view of the intended absolute separation of the Hospital from the College it is proposed that no member of the new Hospital Staff shall retain his position as a teacher of a preliminary or intermediate subject at the College. For the same reason composition fees will be abandoned, and the student who has entered at King's College for the early studies will not be unduly tempted to proceed to the Camberwell Hospital for his advanced studies by any advantageous financial arrangement. He will be absolutely free to select for his advanced studies the hospital which attracts him most. Just as it is believed that there will be many students at the new hospital who have never been near King's College, so it will be open for any students entering at King's College for the early studies to close their connexion with the College when these are finished, and pursue their advanced studies at the hospital of their choice.

At all events this is our aim. Although from considerations of sentiment it is evidently imperative to retain the name of "King's" at the new hospital, yet our purpose is that these two institutions, the College and the Hospital, should stand to all intents and purposes independent of one another—each prepared to provide for any student of medicine who applies the opportunity of study in the particular subjects of his requirement.

An Address

ON

THE METHODS OF ACQUIRING KNOWLEDGE: ITS HELPS AND HINDRANCES.

Delivered at the opening of the Medical Faculty of the University of Birmingham on October 3rd.

By PHILIP H. PYE-SMITH, M.D., F.R.C.P., F.R.S.,
Vice-Chancellor, University of London; Member of the General Medical Council, and Consulting Physician to Guy's Hospital.

Let me first congratulate you upon the progress which this great University has already made since it received its charter. Like Manchester and Liverpool, it has left a connexion with the University of London which for so many years existed, and, as representing the parent body, I may say that we are convinced it was for our benefit as well as for yours. May Birmingham become as noted for learning and national progress as the greatest universities of our own or any other country; and, as Greek colonies preserved a slight but real tie of connexion with their metropolis, as the New Englanders who live in Boston visit Boston in Old England, so may this University perhaps regard with special goodwill the institution which protected its infancy and provided incitements to study among its first disciples!

If we look over the history of the connexion between the University of London and its Colleges, we see the constant rivalry for importance between teaching and examining.

In 1827, when a new institution was founded, without the recommendation of age or wealth, with no traditions and with sadly inadequate resources, there were two directions in which it developed. The one was that of conferring degrees and other academic distinctions only as the result of impartial and external examination. The other was to offer to intelligent youths opportunities for acquiring knowledge independently of wealth or of the trammels of scholastic discipline. At first there was no power to confer degrees, and when it was granted by the foundation of a new university in 1836, it was deemed necessary to separate entirely the teaching from the examining bodies. The whole course of public opinion in the seventy years which have since elapsed has tended to diminish the importance attached to competition and greatly to add to the value attributed to education as distinct from instruction. The one criticism was expressed in the term

applied to the University of a graduating machine, and the other called University College a knowledge shop. I think, and you here think, that competition is a valuable stimulus to work, and that many of us owe much to the necessity of acquiring knowledge, often distasteful to oneself, by the necessities of the curriculum; we also believe in the mere accumulation of knowledge, as we see it in clever children, whose memory is always superior to their judgement, and whose aptitude for imbibing information is as remarkable as their imperfect power of using it. We agree, therefore, that neither competitive examinations nor acquiring facts, even if unconnected, are to be discarded because they have been abused. But if we participate in the public opinion, which on the whole is educated opinion, we shall put before knowledge and before competition, in the first place, what is properly called education—the drawing out of the powers of the mind, the discipline which strengthens the mental sinews, and prepares the intellect by a kind of gymnastics for the duties of which it is capable. Side by side, moreover, with the justly increased importance now attached to discipline and healthy development of mind and body, we have also learnt to regard a college or university as a very imperfect instrument for good if it only educates its students, and does not at the same time teach them to add to the sum of human knowledge. But these different aims, like most other aims which are just and practical, are far from being opposed one to another. It is an admirable thing for the memory to be strong and tenacious. It is an admirable thing for a boy or girl to delight in omnivorous reading, to acquire the art of learning quickly, to discern the main and important points to be understood, and to form fresh and tenacious receptacles for every new branch of knowledge which they encounter. It is well that by an honourable ambition young men and maidens should be willing to scorn delights and live laborious days in the hope of attaining the fair garland which adorns the learned brow; and the very power which has been gained by such discipline is that which can be applied to investigation and expansion of knowledge.

First, then, of knowledge. A child learns to name objects, then it connects objects with qualities, and in time forms chains of connexion between related events. It learns that sugar is sweet and that fire burns. It learns to trust to the evidence of its senses, and to measure distances not only by vision, but by the muscular sense of the eye and of locomotion. Before long, an intelligent child is not satisfied with knowing that this and that is a thing with certain colours and shape and movements. He asks himself how he knows that this and that is a fact, and he soon learns that the direct perceptions of the senses are insufficient. He finds that combination of two senses corrects mistakes and strengthens his assurance of fact. He learns to make allowance for atmospheric perspective, for the duration of movements and of visual impressions. He begins to detect various delusions into which observation by the senses will lead him. Before long he will have gained the important conviction that all knowledge derived from the senses is but mediate, that it is not the eye that sees, or the ear that hears, or the finger that feels—that touch and vision, and perception and sound, and pleasure and pain, are processes of the brain, not of the sense-organs. They are states of consciousness, and their continuity makes up the course of life. Even in sleep there are dreams, and on awaking from sleep self-consciousness recognizes the continuity of the time before and the time after unconsciousness.

So much for the development of knowledge by the senses. A further step is taken when a child begins to reason. In following the propositions of Euclid, in learning the elements of logic, he sees how one fact inevitably depends upon another. But an intelligent boy will soon observe that the beautiful sequence of argument in mathematics depends for its perfection upon the absence of reality. A line without breadth, a point without magnitude, a perfect circle, these are not objects of the senses, they are figments of the imagination; and the student finds in the domain of deductive logic that a syllogism is open to the defect of pretending to prove what is really stated in the first premiss. The apparently inevitable process of reasoning which ended in contradiction, the logical fallacies like Sorites, and the conflicting results of the arguments of nominalist and realist schoolmen, led to the conclusion that, however excellent as a method of sharpening the wits, mere argumentation serves only as a sign of warning, "No thoroughfare" by this path.

There is, however, as men at last learnt, another method of arriving at true results than that of tracing the in-