LECTURES

ON

PHARMACY AND THE BRITISH PHARMACOPŒIA.

*Delivered before the Society of Apothecaries of London,
November 21st, 1899.*

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LECTURE I.

THE "PHARMACOPŒIA" IN ITS RELATION TO
MEDICAL STUDENTS.*History.*

MASTER, WARDENS, AND GENTLEMEN,—It is with some diffidence that I venture to address you on the subject of the *British Pharmacopœia*, because in this Hall we are surrounded by many influences which bear directly and largely upon the growth of pharmacy and the formation of the *Pharmacopœia*. We have above us the banners which remind us of the glories of the Society of Apothecaries in the past. We have in an adjoining room portraits connected with the early history of this Society, and of the King who granted the Charter; and I have to remember that, in speaking of the *Pharmacopœia* here, I am speaking to those who probably know more than myself of pharmacopœial processes and of the practice of pharmacy. This is one of the few societies in the City which remains as originally constituted—concerned with compounding drugs, concerned with the preparation of drugs, and concerned also with the education and examination of those who are engaged in these works. I may remind you, in this connection, that a Charter was granted to the Society in 1617 to undertake the examination of those who had been apprenticed as apothecaries, and following this Charter, a year later, the first *Pharmacopœia* was prepared by the London College of Physicians as the standard and guide in the compounding of medicines. The origin of the *London Pharmacopœia*, the forerunner of the *British Pharmacopœia*, is therefore closely linked with the Charter by which this Society examines candidates at the present time.

Although I hope to speak with becoming modesty, yet I feel that perhaps I know more than most people of the principles which actuated those who were concerned in the latest revision of the *British Pharmacopœia*. In the original form of the *Pharmacopœia* of the London College of Physicians it was stated in so many words that the *Pharmacopœia* was intended to be a "standard and guide" for those who conducted examinations in pharmacy, and these words, which occurred in the first *Pharmacopœia* of 1618, you will find are still retained in the present issue of the *British Pharmacopœia*; it is still a "standard and a guide," although it is not solely of value to those engaged in examining students; it presents "a uniform standard and guide, whereby the nature and composition of the substances to be used in medicine may be ascertained and determined."

Three classes of people are concerned in the preparation of this standard and guide: (1) the medical man, (2) the chemist, (3) the medical student.

The Students' Difficulties.

My sympathies are most on the side of the student, and in connection with my own work in the revision of the *Pharmacopœia* I was largely influenced by what I believed would meet the student's wishes. Considering that *materia medica* was not, perhaps a very attractive subject, I was actuated by the desire to make it less repulsive, more easy to understand and to remember. I therefore prefer speaking in this first lecture of the *Pharmacopœia* as it influences the medical student. In my student days the *Pharmacopœia* used to be rather a bugbear, that we heard of from time to time in our lectures; some of us might even have doubted its existence; we never saw it, never consulted it; or, on the other hand, a finger of scorn was occasionally pointed to it, as a book which contained many errors, and might lead to dangers in the examination room. It was a tradition that many doses were excessive and dangerous, and accordingly we were told not to answer too closely by the *Pharmacopœia*, not to be too implicit in our

obedience to the authority originally intended as a standard and guide.

Another reason for speaking first of the relation of the *Pharmacopœia* to the student is that the medical student is somewhat in the position of a minor; he may have well defined opinions, but he has no voice in the compilation of the *Pharmacopœia*; he has no way of directly representing his difficulties with the subject; no means of getting his special requirements attended to. He really has to submit to the *Pharmacopœia* as he has to submit to other conditions of the existence to which he is born, such as measles, or whooping cough, and so he takes the *Pharmacopœia* on trust as one of the necessary evils of life, although there are many things with which he disagrees and cannot understand. This being so, one wishes from the student's point of view to represent a little more fully how it influences education, how it influences examinations, and how it influences textbooks. In all these connections the *Pharmacopœia* is the ultimate standard of authority; for instance, to take examinations, whatever may be the personal views of an examiner as to a pharmacopœial dose, he has to accept the answer given on the authority of the *Pharmacopœia*. That means, of course, that considerable care and considerable attention has to be paid to the dosage of drugs and to their arrangement with regard to the composition of the pharmacopœial preparations. The official doses should be those which would commend themselves to all practitioners and examiners. The *Pharmacopœia* is the ultimate appeal in any question of doubt. I do not know whether in these walls division of opinion ever arises between examiners who are not quite agreed as to the appropriate dose of any particular drug, but I have known the *Pharmacopœia* referred to under such circumstances. Hence from the student's point of view, whether it is right or wrong, the authority of the *Pharmacopœia* is final.

Further it influences the textbooks, and it also influences the whole future life of the practitioner, since in arranging these doses we hope to have put forward something definite for the student to learn; something that shall not require revision so soon as he passes into active practice. It is necessarily by this standard that those who compile textbooks of *materia medica* are guided.

The Descriptions of Drugs.

Of the needs of the student the most important is accuracy. First in regard to the description of drugs. The numerous specimens before me serve to illustrate the principles upon which the descriptions of the drugs in the *Pharmacopœia* have been based. A leading idea is that the drugs and the descriptions should tally; that when the *Pharmacopœia* describes a drug as a blue powder, it should require no effort of imagination for the student to realise what kind of colour the word blue means in the *Pharmacopœia*. I can remember perfectly well how, as students, we used to look at specimens and carefully consider the different points by which we should be able to recognise them again in the examination room, and when we once had made up our minds, we used afterwards to read the description in the *Pharmacopœia* as something that had to be applied, not to the specimen before us, but to something that existed only in the private collections, or perhaps only in the minds of those who compiled the *Pharmacopœia*. Now the difference between the descriptions and the actual drugs in our medical museums and in the examination room was one which shook the confidence of students very greatly. In the revision of the *Pharmacopœia* it was rather difficult sometimes to realise how this non-applicability of description came about, how anyone in all seriousness ever sat down and wrote a description which was so very unlike the actual thing. Colour blindness and idiosyncrasies have always to be allowed for, but still the portrait of the same person, painted by two different artists while showing each painter's particular method, should have some resemblance to the original; I mean that in spite of differences of method you should be able to recognise the individual. We were not always able to do this with the descriptions of former *Pharmacopœias*. I am not for a moment wishing to criticise or to find fault with those who compiled former *Pharmacopœias*, but merely to indicate my belief that their point of view was perhaps a little different from ours. For instance, it is perfectly possible, in describing red iodide of mercury, to describe either what you

are able to obtain at every chemist's shop where you ask for red iodide and are supplied with a drug which, in its purity answers all requirements, or it is possible to describe such a specimen as I have here, which is really almost a chemical freak. It is a specimen of extraordinary beauty, in large crystalline plates, one that has been obtained with labour by a chemist, partly for his own amusement, partly as a museum specimen, but it is of no value for facilitating the recognition of mercuric iodide as an article of commerce.

Now the first idea in our descriptions at the present time is to describe good specimens, as pure as they can be obtained for medicinal use; for this purpose we must be able to obtain sufficient quantities of a drug, and these must be of sufficient purity to be safe from error. Mr. Martindale has kindly lent me numerous crystals of official drugs which are absolutely unlike anything described in the *Pharmacopœia*, or, indeed to be obtained, except in small quantity, at the cost of infinite labour; no good purpose would be gained by a painstaking description of these crystals; the official descriptions can only apply to articles of a reasonable degree of purity, such as can be used without risk to the patient, and without establishing an impracticable standard.

In its descriptions the text of the *Pharmacopœia* indicates any alteration that a crystal might undergo with age, with exposure to light, or to moisture; the words are so chosen that they shall exclude any such deterioration that crystals or vegetable preparations would undergo. They would exclude, as being below the standard, vegetable drugs, collected at times of the year when the particular part of the plant is deficient in active principles.

The Chemistry of the Pharmacopœia.

This is another point upon which the student requires accuracy, and it has given a great deal of trouble. It is inevitable in the course of the work to use numerous chemical terms, both with regard to the tests and the nomenclature. For instance, with the official names of crystalline salts, whether we should speak of ferrous sulphate or sulphate of iron, of mercuric chloride or perchloride of mercury, and so on. Numerous chemical changes of nomenclature have to be borne in mind. It was a question whether we were to speak of the subnitrate of bismuth or of the oxynitrate. In all these directions those responsible for the compilation of the present *Pharmacopœia* have been very careful to adapt it to modern needs. Chemical referees have carefully revised the proof sheets, and have thus kept every statement fully abreast of every modern advance of chemistry, for it is absolutely essential that the *Pharmacopœia* should not fall behind the times in that respect, and that students should not find a lack of harmony between the statements in the *Pharmacopœia* and those in their lectures and textbooks.

The synthetical work that has been undertaken with regard to substances like antipyrin or acetanilide has to be carefully considered, and we have to take the latest advances that have been made in representing the latest formula of each substance, and these, perhaps, are the points of the chemistry of the *Pharmacopœia* requiring the greatest consideration. The formulæ of organic compounds have been carefully revised, and are now believed to be in accordance with the most modern teaching.

Then, as influencing the education of the student, those who have compiled the *Pharmacopœia* have also been very careful in indicating the value of the tests to be employed in determining the purity of drugs, and a very great change has been made in stating not only what are the tests which will give reactions and will not give reactions, but in indicating what are the substances which we are looking for, and the presence or absence of which should be ascertained. In former *Pharmacopœias* the reactions were described but not explained.

The Botany of the Pharmacopœia.

The next point on which the student requires greater accuracy—and this affects chemists more than medical students—is with regard to the botanical terms employed. On this subject I do not propose saying much, because botany at the present time occupies such a very small proportion of the education of the medical student. I have examined in *materia medica* for some years, and it is very rare to meet with a colleague who has insisted upon having

the full botanical name of a drug; for example, the name "aconite" is generally deemed sufficient. The student is rarely required to add a distinctive title to show which kind of aconite the specimen might be, though to be correct from the pharmacopœial point of view, and for descriptive purposes of the *Pharmacopœia*, we must indicate which variety of aconite is official. But, although a great deal of trouble has been taken with the botanical terms and descriptions, and a great deal of valuable assistance has been received from Dr. Thistleton Dyer and Professor Holmes, the Botanical Referees. I prefer to say very little about that side of the *Pharmacopœia*, as it is not at present of much interest or importance to the medical student. Long lists of the seeds, leaves, and barks of the *Pharmacopœia* are not now required at examinations. These lists do not indicate any knowledge of the value of the drugs, and they group together artificially and uselessly a large number of drugs which have no connection of action. There was nothing whatever in questions involving these lists to indicate the relative importance, say, of *strophanthus* seeds and of *stavesacre* or *cardamom* seeds.

Simplification.

The next requirement of the student is in regard to simplification. The medical student does not like to trouble himself to learn too much. He likes to understand the reasons of all detailed processes; when he is confronted with a long list of tinctures, infusions, or other official preparations, in which the method varies with the drugs, he is extremely apt to ask why different processes are employed. Thus, with the infusion of quassia and the infusion of *calumba*, he wishes to know why, in preparing the former, he is directed to use a covered vessel, while no such reservation is mentioned in connection with the latter.

The student requires simplification where simplification is possible. Where a large number of official preparations can be prepared on some definite plan, and where there are no cogent reasons why they should not be prepared on that particular plan, efforts should be made to meet this desire for simplification.

With regard to dosage, methods of preparation, and standardisation efforts have been made to simplify work. First, with regard to dosage, you will find that with one or two exceptions the tinctures have had their strength so modified that they can now be divided into two classes, so that the dose shall be either half a fluid drachm to 1 fluid drachm, or else 5 to 15 minims. This alteration, which simplifies the work of the medical student very much, was really undertaken by the Pharmaceutical Society with the utmost cordiality as soon as it was indicated from the *Pharmacopœia* Committee that it was desirable to obtain greater uniformity. At one time it was considered advisable to prepare the tinctures with the minimum expenditure of alcohol, to use alcohol of the minimum strength or quantity, to produce a fluid which should possess a definite medicinal action, and the consequence was that, as the solubility and the activity of different drugs vary greatly, the doses of tinctures extended over a wide range. Now the point to be determined was whether it would be possible, either by using a stronger form of alcohol, or a weaker, to bring the weak tinctures up and the strong ones down, so that the dose would be practically the same for at least two groups of tinctures. An easy way for the student to remember to which group any particular drug belongs is to ask himself, "Is this a drug possessed of strong, of active, of possibly violent physiological properties? Is this a drug, for instance, I need feel any anxiety about?" If so, its dose will be small. If it is not possessed of such active properties its dose will be large.

Many of the modes of preparation have been similarly simplified. With regard to standardisation this is a question which concerns chemists and medical men perhaps far more than students, so that I will reserve my remarks on it for the present.

Omissions.

The third direction in which the student is greatly concerned in any revision of the *Pharmacopœia* is with regard to the elimination or the removal from the book of any substance that is unnecessary. With the examinations of the University of London, where there is no syllabus for *materia medica*, it is in the power of the examiner to ask any question

concerning any pharmacopœial drug; and hence it is of extreme importance that a student should know why many substances that are not used, or that are rarely used, should not be removed from the list of articles contained in the *Pharmacopœia*.

From a student's point of view the list of omissions is the most important and most satisfactory feature in the new *Pharmacopœia*. There is a long list containing, I think, 188 articles of one sort and another that were included in the *Pharmacopœia* of 1885, and are deleted from the *Pharmacopœia* of 1898. With regard to this list of omissions a great deal of trouble was entailed, and in some of the initial steps which led to these deletions I had a large share. I feel satisfied in having got these out, but I should have been better pleased if we had whittled down the *Pharmacopœia* still further, and in looking over the list of omissions I do not for a moment regret the exclusion of any single drug or preparation.

The following question presented an initial difficulty: "On what principle is it to be decided that a drug is of no further value, or that its inclusion in the *Pharmacopœia* is no longer desirable?" While the first principle of the *Pharmacopœia* is to indicate the standard of purity of the substances used in medicine, there is no justification for retaining any drug that is not used with reasonable frequency by the general practitioner. Now with regard to the inquiries which were made by the Pharmacopœia Committee, much assistance was given by a large number of authorities, including the Royal College of Physicians of London, and the Society of Apothecaries of London, as recorded in the Preface. It was possible, however, that the opinions expressed were mainly those of teachers and consultants, and that they might scarcely represent the views of general practitioners. Information of great interest and of a more wide-spreading character resulted from private enterprise; I mean from such inquiries as were undertaken by Mr. Martindale, for instance, who had investigations made in several large centres of the last 2,000 copies of prescriptions of pharmacopœial substances. These indicated the number of times that a drug was used in these centres, and in that way a list was prepared which showed the degree of popularity attaching to each drug. This list is of value, but it fails just where the list of recommendations obtained from the different examining bodies had failed before; it does not indicate what the general practitioner uses. It is of very little use to consult the prescription books of chemists, which only show how often certain drugs are prescribed. We do not in that way find out the drugs used by the general practitioner; this analysis cannot represent what the doctor uses who dispenses his own drugs. Now, to meet that objection yet another investigation was undertaken by the Therapeutic Committee of the British Medical Association, and some of you may remember that a mysterious letter was sent round in which you were asked to indicate the relative frequency of your employment of certain drugs. It consisted of a table that was drawn up into three columns, marked:

Often.		Rarely.		Never.
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Although from the first it was obvious that these lists contained numerous errors and must be used with discretion, they were of much service as an indication of the extent to which certain drugs had dropped out of use, and could therefore be omitted from the *Pharmacopœia*. To this inquiry, however, I shall have to refer more fully in my next lecture.

THE FRENCH MEDICAL SCHOOL OF BEYROUT.—The Medical School of Beyrout, Asiatic Turkey, which is under the direction of Jesuit Fathers, has recently obtained a charter enabling it to grant licences to practise. The number of students has been steadily increasing for some years, and is now about 150. An extensive piece of land has recently been acquired, and on this site a new school is to be erected at an estimated cost of two millions of francs (£80,000). The French Government has promised a substantial subvention. A jury of examiners has recently been appointed, with Professor Cornil of Paris as President, the other members being Professor Mayet of Lyons, Dr. Walther, *agrégé* of the Paris Faculty, three professors of the Medical School of Constantinople, and the Professors of the Faculty of Beyrout.

THE CHANGES IN THE CENTRAL NERVOUS SYSTEM OF TWO CASES OF NEGRO LETHARGY: SEQUEL TO DR. MANSON'S CLINICAL REPORT.

[WITH SPECIAL PLATE.]

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Two cases of Congo sickness, brought to England by Dr. Grattan Guinness, were admitted into Dr. Abercrombie's wards at Charing Cross Hospital last year, and for a short time were under my care; and a lecture with an account of these two cases was delivered by Dr. Manson, and reported in the *BRITISH MEDICAL JOURNAL*. These patients subsequently died, and the central nervous systems were handed to me for investigation. Before proceeding to describe the changes which were found, and which are illustrated in the accompanying micro-photographs, it will be well to remind my readers of the principal clinical phenomena presented by the patients during their illnesses. I am enabled to do this by making a summary from the case-book notes carefully abstracted by the house-physician Mr. Clogg, to whom I wish to express my obligations.

CASE I.—Eli Mboko, aged 20, was a Congolese school teacher of exceptional talent, speaking English perfectly, and having translated a book from English into his native language. His illness commenced twelve months before admission to the hospital on September 24th, 1898. Previously cheerful, interested in his avocation, he became vacant-minded and miserable, with little interest in his daily work, and as the disease progressed he would frequently fall asleep while at his work. These symptoms became more pronounced as time went on, but during his voyage to England he appears to have improved a little. Upon admission to the hospital, he was found to be fairly well nourished. The skin had to some extent lost its natural glossy condition, and there were a few papules over the abdomen. There was a general enlargement of the lymphatic glands, but they were discrete, and not anywhere massed together.

Nothing abnormal was found in the thorax or abdomen. Parchment scars on the fronts of both legs were evident. Examination of the eyes by Mr. Treacher Collins revealed nothing abnormal.

Examination of the *faeces* showed presence of the ova of the following parasites: *Ankylostoma duodenale*, *trichocephalus dispar*, *ascaris lumbricoides* (these parasites were treated successfully by anthelmintics). Examination of the blood by Dr. Manson on numerous occasions showed nothing markedly abnormal except the presence of the embryo *filaria perstans*, although there was some slight degree of *anæmia*.

The striking features to be associated with the nervous lesions, and which continued and progressed till the fatal termination, were:

1. Lethargy and a tendency to sleep the greater part of the day. From this drowsy condition the patient could always be aroused.

2. Slowness of speech without any tremor and without any noticeable change, except that there was an unwillingness to respond to questions owing to a sense of fatigue and drowsiness. The reaction time, as denoted by the time taken to frame an answer in response to a question, was much prolonged. When the patient spoke he usually made a curious grimace—elevation of the upper lip and nostrils.

3. Progressive motor enfeeblement, paresis like a man who had suffered a long illness. His gait also was that of weakness rather than paralysis or ataxy. He shuffled along, hardly lifting his legs from the ground, and with a wide base. Occasionally he would reel; there was nothing noteworthy about the reflexes, but the muscles, as indeed the whole body, were wasted, although the appetite was fairly good. There was no loss of sensation, and he complained of no definite pain except a pain in the back of the head, which he had had early in the illness. He suffered for some weeks with gingivitis.

4. The temperature until just towards the end of life, when hyperpyrexia occurred, was either normal, subnormal, or