Minutes of evidence relating to anaesthetics : at the Home Office, Whitehall.

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DEPARTMENTAL COMMITTEE

ON

CORONERS.

Minutes of Evidence relating to

ANÆSTHETICS.

At the Home Office, Whitehall.

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FOREWORD.

In issuing to the Members this reprint of the evidence relating to anæsthetic and analgesic administration, the Council of the Incorporated Society ventures to hope that it will be carefully perused by every Member who is not already familiar with its contents, and afterwards retained for reference. In examining the evidence, the reader will be impressed by the overwhelming abundance of opinion volunteered by the medical profession, and the comparative paucity of representative opinion of those most conversant, and therefore most immediately concerned, with nitrous oxide and analgesic administration. As a factor in the framing of legislation, the evidence upon dental anæsthetic practice volunteered by an interested medical profession can carry little weight, much of it being palpably biassed and academic, and the evidence given on behalf of the British Dental Association must stand discredited by certain glaring inconsistencies with truth, notably the ridiculous utterances of Mr. T. Moreton Smale, on pages 133-4 (reprint). In the main, the evidence of Mr. F. Butterfield and that of Mr. W. F. Bowen are recitals of their individual opinions in reply to direct personal questions, and being such, no pretence is made that their replies are representative of the collective opinions of the Society's members. Nor could they be otherwise considering that the opinion elicited from the individual witness must, to meet the questions put, be based upon his own personal experience and knowledge, however extensive or however limited his knowledge may be, and this suggests a reason why such enquiries and recommendations seldom carry weight when collective interests are receiving Parliamentary consideration.

Undoubtedly, the most valuable evidence, and the only really representative evidence, given in the Society's interests, are the statistics of anæsthetic and analgesic practice by its members. From the sterling authenticity of the records—a feature superior to insinuation—they will prove not the least formidable of the many considerations that will shape the destiny of any legislative proposal on the subject.

H. E. I.

James T. Henderson.

29/3/13.

DEPARTMENTAL COMMITTEE

ON

CORONERS.

MINUTES OF EVIDENCE RELATING TO

ANÆSTHETICS.

AT THE HOME OFFICE, WHITEHALL.

FIFTH DAY.

Friday, 19th February, 1909.

PRESENT:

SIR MACKENZIE CHALMERS, K.C.B., C.S.I., *in the Chair.*
SIR MALCOLM MORRIS, K.C.V.O., F.R.C.S., Edin.
SIR HORATIO SHEPHARD, LL.D.
Mr. ARTHUR THOMAS BRAMSDON, M.P.
Mr. WILLIAM H. WILLCOX, M.D.
Mr. J. F. MOYLAN *(Secretary).*

Mr. FREDERIC HEWITT, M.V.O., M.D., M.R.C.S., examined.

1174. CHAIRMAN.—You are a member of the Royal College of Surgeons?—I am.

1175. And for many years, I think, of your professional life you have devoted yourself to the administration of anæsthetics?—Yes, for about 25 years.

1176. I think you have held the office of Senior Anæsthetist to the London Hospital, and you have been an anæsthetist to the Dental Hospital?—Yes, and I am Physician-Anæsthetist to St. George's Hospital at the present time.

1177. And you have administered anæsthetics, of course, in many thousands of cases?—Yes.

1178. I think you have kept an account for one year, and

in that year you have administered anæsthetics in no less than 3,000 cases?—In over 3,000 cases.

1179. We all know that you have had great success as an anæsthetist. In those 3,000 cases, I believe, you had no mishap? —None whatever.

1180. You have kindly furnished me with some points on which you are going to give us some evidence, and we have the Draft Bill for an Act to regulate the administration of general anæsthetics which you submitted to the Secretary of State, and which has been referred to us, but some of us are laymen, and we should perhaps appreciate your evidence better if I may begin by asking you one or two general questions?—Certainly.

1181. In the first place, as I understand the law, apart from any criminal intent, any member of the public may administer an anæsthetic to any other member of the public without committing an offence?—I believe that is so.

1182. Therefore, there is nothing in the law to prevent a herbalist or bonesetter or chiropodist or a quack doctor from administering an anæsthetic?—So far as I know, there is nothing.

1183. On the other hand, if, say a bonesetter wants to do a painful operation and wishes to call in a qualified medical practitioner to administer the anæsthetic, that medical practitioner would, if he administered the anæsthetic, commit a professional offence, for which the General Medical Council would call him to task?—Yes.

1184. Whereas, if the bonesetter called in his cook or his housemaid to do it, nobody would be penalised?—I believe that is so.

1185. I suppose your evidence refers to what one may call, in popular language, general respirable anæsthetics?—Yes.

1186. May I ask you what are the general respirable anæsthetics in common use at the present time?—Nitrous oxide, or laughing gas, ether——

1187. Is that ethyl ether?—ethylic ether—chloroform, ethyl-chloride, and various mixtures of ether and chloroform.

1188. For instance, A.C.E.?—That would be a mixture of alcohol, chloroform, and ether; that is not used so much as it was a few years ago; but various mixtures of ether and chloroform —comparatively small proportions of chloroform to larger proportions of ether—are used very frequently.

1189. The next question arises on that. In your opinion, are some of these anæsthetics safer than others, or does it depend on the particular operation and the particular patient as to which you would use?—Other things being equal, some anæsthetics are much safer than others.

1190. Which, in your own experience, would you prefer?— Nitrous oxide is the safest of the general anæsthetics. Then, I think, one might put ether

1191. Sir Malcolm Morris.—You would put ether second? —Yes.

1192. Chairman.—Has ether any specific action on the heart?—It is a great stimulant; in fact, if ether be given on a mask with plenty of air, I should say that it is as safe as nitrous oxide. Then, next to ether, I should put mixtures of chloroform and ether which are rich in ether, the safety being in proportion to the percentage of ether.

1193. And then what next?—Then we should come perhaps to ethyl-chloride, and then to chloroform itself. I think that would roughly indicate the relative dangers of anæsthetics themselves.

1194. If one anæsthetic is somewhat safer than another, in what cases do you prefer one to another?—To take nitrous oxide as an example, nitrous oxide is, generally speaking, the safest anæsthetic; but there are certain conditions in which nitrous oxide, *per se*, given without any air or oxygen, would be more hazardous than chloroform.

1195. To the life of the patient?—To the life of the patient; so that a great deal depends upon the type of individual to whom the nitrous oxide is given.

1196.—Apart from the mere question of possible safety, does the nature of the operation determine the anæsthetic at all?—Yes, very largely. There are a great many operations in which nitrous oxide would be absolutely out of court altogether.

1197. You could not keep up the anæsthesia long enough; —No; the anæsthesia is not sufficiently deep for a large number of modern surgical operations. But when nitrous oxide is given with air or with oxygen in properly regulated proportions, then it can under certain conditions be given continuously. Perfectly pure nitrous oxide, if given so that no air whatever gains access to the lungs while it is being inhaled, is not respirable for more than about one minute.

1198. That is to say, death would result?—Yes.

1199. Just as if it were carbon monoxide?—Not as rapidly, perhaps, as that, but as rapidly as if it were pure nitrogen. At the end of that time breathing comes to a standstill, and there is asphyxia produced; but if certain percentages of oxygen are added to the nitrous oxide, then, in proportion to the amount of oxygen, that nitrous oxide may be made respirable. A dog, for example, has been kept breathing a mixture of nitrous oxide with 15 per cent. of oxygen for three consecutive days, showing how extremely safe nitrous oxide must be, provided that it is given in such a way as not to produce aphyxia—in other words that it is given with a sufficient proportion of oxygen to keep up respiration.

1200. Sir Malcolm Morris.—Oxygen or air?—Oxygen is preferable to air, because the nitrogen in air acts as a diluent, so that one loses some of the anæsthetic factor.

1201. CHAIRMAN.—When oxygen is mixed with nitrous oxide, do you still get the same anæsthetic effect?—One gets a better anæsthetic effect than when the gas is given perfectly pure; and that is why it may be administered for a considerable number of operations. I have myself, for example, given nitrous oxide and oxygen, without any air whatever, in an operation lasting over 35 minutes.

1202. Who determines the anæsthetic to be used, the surgeon or the anæsthetist—or is it a matter of consultation?—Generally in large centres like London the anæsthetist; but the more one departs from the trained anæsthetist to the assistant or to the general practitioner, the more, perhaps, has the surgeon to say in the matter.

1203. For surgical purposes, does the surgeon sometimes require chloroform instead of the other anæsthetics to be used?—Yes, that is so.

1204. For what purpose would that be?—Chloroform produces greater quietude on the part of the patient; the surgical conditions under chloroform are perhaps more perfect than those under other anæsthetics.

1205. If the operation is of a very delicate character, requiring very delicate manual skill, chloroform would be preferred?—Yes.

1206. May I take it that, in popular language, as regards these respirable anæsthetics, they are inhaled into the lungs, they then saturate and intoxicate the blood, and the intoxicated blood is carried to the brain, and the higher brain centres are paralysed?—Yes.

1207. So that you get what I may call complete personal unconsciousness?—Yes, generalised anæsthesia due to the unconsciousness.

1208. The sensations may be transmitted to the brain, but the receiver is put out of action?—Yes.

1209. Would you kindly describe to us, who do not know, what the course of administering an anæsthetic is. First of all, I suppose you see your patient?—Yes.

1210. Then what sort of examination do you make previously to determining the anæsthetic to be administered?—One generally inspects the patient, and examines the air-way to see whether it is in any degree occluded—whether their is a free air-way.

1211. Do you mean by the nose and mouth?—Yes; that is a very important matter, often much more important, for example, than listening to the heart, because these anæsthetics have to be introduced through restricted and constantly varying respiratory passages. They have not to be introduced, as in physiological laboratories, by means of a tracheal cannula. I am now perhaps expressing my own personal opinion. I personally believe that

the phenomena of general anæsthesia are very largely dependent upon the way in which the anæsthetic passes through these upper air passages. Very often there is some inadequacy in breathing, and grafted upon the anæsthesia there is some modified asphyxial condition referable to the particular air passages of the particular patient.

1212. I asked you that question for this reason : your preliminary examination requires a certain amount of medical skill to determine the condition of the patient ?—Yes.

1213. What else do you examine beside the respiratory passages ?—That is a difficult question to answer. Of course, it is obviously impossible to spend a very long time in examining patients, and therefore one condenses one's examination into as short a time as possible to elicit the main points. For instance, one generally asks a patient to take a deep breath to see whether respiration is deficient ; to give a cough to see whether there is any secretion in the air passages ; to breathe through the nose with the mouth closed to see whether the nasal passages are free. Having done that, one listens to the heart.

1214. Sir Malcolm Morris.—There is just one other point —the teeth ?—Yes, removing artificial teeth. I meant that to come under the general aspect of the upper air tract. One sees that artificial teeth are removed. As I have said, one examines the heart and one makes a few enquiries as to the presence of any disease that the patient may have ; for example, one frequently asks whether the kidneys are sound, whether there is any diabetes. On those points one would, perhaps, be informed by the surgeon or by the doctor in attendance.

1215. Chairman.—Does it make any difference whether the patient is alcoholic ?—Yes, certainly. I omitted that One generally makes a few enquiries, although one can often tell from the appearance of the patient. Then the question of tobacco is interesting.

1216. Yes, to many of us ?—Great smokers display characteristic phenomena under anæsthetics.

1217. Do they go under more easily ?—No, they are more insusceptible to anæsthetics.

1218. Do they suffer less stomachic trouble afterwards ?—I am not able to say that ; but that is so with regard to alcoholic patients.

1219. Sir Malcolm Morris.—Is chloroform more dangerous with a big smoker than ether ?—I should say, other things being equal, chloroform was.

1220. How about an alcoholic, asthmatic, badly breathing, fat man ; would you say ether then or chloroform ?—Probably a mixture of the two anæsthetics. Ether would be contra-indicated because of the asthma, and chloroform would be contra-indicated because of the other conditions.

1221. CHAIRMAN.—A good deal depends upon the general medical knowledge of the anæsthetics quite apart from the mechanical administration or watching the symptoms?—Yes, quite so.

1222. Now, how do you administer these anæsthetics. Will you take two examples: one nitrous oxide and the other ether and chloroform?—In giving nitrous oxide, one has to employ some kind of reservoir for the gas; one has to have a face piece that fits the patient accurately, with valves that work accurately, and the nitrous oxide is admitted to the face piece through these valves, so that with each inspiration the gas is breathed and with each expiration it escapes at the expiratory valve. In some methods of giving nitrous oxide there is a certain amount of re-breathing of the gas permitted; in others air is admitted from time to time whilst the gas is being inhaled. Then, as I mentioned just now, oxygen and nitrous oxide may be administered together, by employing a regulating apparatus. Oxygen is admitted throughout the administration, and the administration is continued till the phenomena of anæsthesia appear.

1223. I will ask you about them presently?—Supposing the operation is a dental one, the face piece is removed and the operation commences; that is the ordinary dental administration.

1224. Clearly you could not have the face piece on and do the operation at the same time?—Yes; the face piece must be removed before a dental operation is begun.

1225. May I ask you one question on what you have told us. You talked about admitting the oxygen with nitrous oxide. Is that arranged mechanically, or does it depend on the skill and experience of the operator?—Both.

1226. No mechanical operation can dispense with what I may call human skill?—No, it is impossible, in my opinion; because very often the most admirably contrived mechanical appliances will get out of gear.

1227. It will give too heavy a dose or too light a dose?—Yes.

1228. Now, will you come to the mixtures of chloroform and ether?—Mixtures of chloroform and ether are generally given upon what are known as semi-open inhalers, that is to say, from inhalers without bags, but inhalers which allow air to pass through the inhaler and through a sponge or other medium moistened with the particular mixture. On the other hand, sometimes these mixtures may be given on a perfectly open mask, on flannel stretched over a wire frame.

1229. Not semi-open?—No, a perfectly open mask consisting of flannel or domet stretched over a wire frame.

1230. Is the percentage of anæsthetic as compared with the air a matter of great importance?—Yes, speaking generally, in mixtures of chloroform and ether, and in chloroform itself.

1231. What would be the percentage of the pure anæsthetic

as compared with the ordinary air in the case, say, of chloroform. Are there any mechanical appliances for regulating it exactly?—Yes, there are several.

1232. But you must always be watching those appliances to see that they do not get out of gear?—Yes; if they are used they require the human element as much as the mechanical element.

1233. Are there any symptoms which show whether too small or too large a percentage of chloroform is reaching the patient's lungs?—Yes; if too small a percentage of chloroform were given, there would be signs of partial recovery, that is to say, a movement or noise on the part of the patient; whereas if too large a percentage of chloroform were being used, there would be signs of over-dosage.

1234. Which are visible to a skilled eye?—Yes.

1235. As regards these two classes of anæsthetics, I suppose there is a general similarity in the operation of chloroform and ether?—Yes, there is a general similarity.

1236. But nitrous oxide is rather by itself?—Yes.

1237. Can you tell us the stages through which a patient goes—take, first, nitrous oxide?—May I take all the anæsthetics together to start with?

1238. If you please; if you think the stages are the same?—They are, roughly, the same. The first stage is generally one of disordered consciousness, with analgesia, that is to say, inability to feel pain.

1239. Is there great discomfort in taking the anæsthetics in those cases?—A great deal depends upon the way in which they are given. They may be made so unpleasant that the recipient will never again have another anæsthetic, or they may be made perhaps so pleasant that the patient does not mind the process at all.

1240. Is there any stage at which he has a certain sense of a feeling of suffocation?—That depends upon the way in which the anæsthetic is given, and upon the kind of apparatus that is used—in fact, upon the administrator.

1241. Then what is the second stage?—In the second stage consciousness is lost.

1242. Do you mean general consciousness—not merely a sense of pain?—Yes, general consciousness is lost; the patient becomes unconscious.

1243. Unconscious of every surrounding?—Unconscious of his surroundings.

1244. No external stimulus is carried to the brain?—It is not appreciated by the brain, but at the same time ordinary reflex phenomena may still be elicited; in fact, they are frequently exaggerated. For example, if a tooth is taken out during this stage the hand may be raised and will grasp the forceps, but the patient will not remember having grasped the forceps.

1245. Has that patient suffered pain, in your opinion?—That is a very difficult subject. The patient certainly has no recollection of pain. Whether or not pain is felt at the moment, I am not prepared to say.

1246. In deep anæsthesia it would not be felt, I suppose?—It would not be felt in deep anæsthesia; but I should not like to express an opinion on that other point. It is generally stated that no pain is felt.

1247. You have some guide, have you not, in this: that before ordinary consciousness is abolished the sensation of ordinary pain goes; the sensation of pain goes before consciousness?—Yes, that is so; it frequently does. One cannot always depend upon producing that true analgesic stage, but it frequently is present.

1248. There is a distinction, in fact, between anæsthesia and analgesia?—Yes.

1249. Then what is the next stage?—In the next stage deep anæsthesia or coma is produced and reflex acts are for the most part abolished. Touching the eye, for instance, produces little or no closure of the lids, and incision produces little or no reflex movement.

1250. Sir Malcolm Morris.—Varying enormously with the part?—Yes. But even in this stage there are certain reflexes, which it is not advisable to abolish, which I consider a very important point. I often think, if I may so here, that some of the most important truths one learns in life are those that one has learnt as the result of one's own mistakes and misapprehensions. Years ago I used to believe that it was the right thing to abolish all reflex phenomena in giving anæsthetics, but now I do not believe it.

1251. Chairman.—Except for the purposes of the surgeon?—Yes; but even the surgeon can obtain all that he requires, and yet one can remain, as it were, within sight of land, that is, within safe limits.

1252. The fact is that you tend more and more to produce light anæsthesia, not deep anæsthesia?—Yes.

1253. Sir Malcolm Morris.—Can you give us an example?—I should be very pleased to give a very typical and a very important example, showing how one has as an anæsthetist to keep the balance so carefully adjusted as to make it sometimes rather a difficult matter. Very often in abdominal cases, of which we get a large number nowadays, there is a certain amount of intercurrent shock, fall of blood pressure, pallor, and small pulse. That shock, though of surgical origin, may be partly dependent upon the degree of anæsthesia. In other words, if the patient be very deeply under chloroform, if his blood pressure has been greatly reduced by chloroform, he is more liable to show grave symptoms of shock than if his blood pressure has not been greatly reduced by chloroform; because these two factors operate in the

same direction. Chloroform lowers the blood pressure, and surgical shock lowers the blood pressure. The result is that in certain abdominal cases, if the patient is deeply under chloroform, the fall of blood pressure may be so great as to bring about alarming syncope, because of the two factors which are in operation. Now, in such a case as that it is necessary in the interest of the patient to reduce the depth of the chloroform anæsthesia, so that the blood pressure rises *quâ* both the chloroform and the shock; the pulse then becomes better, and one is able to keep that patient delicately adjusted perhaps for an hour at a time so that he neither moves inconveniently for the surgeon owing to the lightness of the anæsthesia nor is he so deeply anæsthetised as to suffer from alarming surgical shock. I think Sir Malcolm Morris will agree with me that that is about the best illustration I can give of what is often required nowadays in the precise adjustment of the anæsthetic.

1254. Is that surgical shock dependent upon loss of blood?—No, not upon loss of blood.

1255. On the mere fact of altering the balance of pressure within the peritoneal cavity?—Upon injury to the sensory nerve districts, as in pulling upon the peritoneum or removing a breast. In many of such cases the anæsthetist has to treat a condition which the surgeon has brought about and is responsible for.

1256. CHAIRMAN.—Speaking broadly, is the risk to the patient proportionate to the length of time he is kept under anæsthesia, or not?—It often is.

1257. But not necessarily. It is a fact, for example, that in abdominal cases anything over an hour constitutes risk for the patient.

1258. SIR MALCOLM MORRIS.—Is there anything special to be said about anæsthetics in operations on the air passages, from the standpoint of adenoids, and so on, which are so exceedingly common at the present time?—Yes, they require special skill.

1259. Less anæsthesia?—Yes, operations upon the upper air passages usually require a lighter degree of anæsthesia, so that the patient may swallow and cough and asphyxia may be avoided. At the same time, in some of these cases, coughing, swallowing, or other phenomena of light anæsthesia may be inconvenient or even dangerous *quâ* the operation.

1260. That requires great skill?—Yes—a fine adjustment of the degree of anæsthesia.

1261. CHAIRMAN.—Then what is the next stage—recovery, I suppose?—It should be, but sometimes the state of over-dosage is reached. If more anæsthetic is given than is necessary, toxic symptoms begin to appear, and then, if the anæsthetic is continued, the patient, of course, would succumb.

1262. Then what is the next stage—recovery?—Yes, it would be recovery.

1263. In cases of recovery, does general consciousness return before the sense of pain returns very often?—Patients vary. I could not say that it is so invariably.

1264. But sometimes does analgesia remain after general consciousness returns?—Yes, that is so; there is, generally speaking, an inverse order of things in the recovery.

1265. For instance, I suppose that a patient might recover consciousness, be put to bed, and might not feel a very hot bottle?—Yes, that frequently happens, and I have actually known stitches being put in whilst the patient was talking.

1266. The patient being absolutely unconscious to pain?—Yes, the patient being in a true analgesic state.

1267. Does not that rather throw light upon what we were discussing a minute ago, namely, that you may have very light anæsthesia, but the sense of pain will be absolutely abolished?—Yes.

1268. Have you known any instances of injury being done by nurses or otherwise from putting on applications during the time of unconsciousness?—If you include hot bottles, I think I must have come across at least a hundred such cases in my experience.

1269. And with other things, too—say a poultice? I have not come across cases of that kind.

1270. The patient feels eventually, but not at the time?—Yes.

1271. Dr. Willcox.—In labour sometimes very little anæsthetic is required, is it not?—Very little indeed; a very light form of anæsthesia.

1272. Chairman.—When the patient recovers consciousness, is all danger over *quâ* the anæsthetic?—Not necessarily.

1273. What is likely to happen after the patient has recovered?—Generally all danger is over, but there might be pulmonary sequelæ referable to the anæsthetic; there may be pneumonia or bronchitis following the administration of the anæsthetic.

1274. May I ask you, in an important private case, how long as an anæsthetist would you watch the case after the operation is over?—That, if I may say so, is a very important question. I maintain that the patient should not be left until the act of vomiting or coughing has taken place, or until some phonated noises have been made.

1275. Speaking?—No, it is not necessary to wait for that.

1276. Sir Malcolm Morris.—A cry?—Yes, a cry of some kind; but, generally speaking, the act of vomiting or coughing should have been passed through quite safely, and the patient placed upon the side before the anæsthetist leaves the patient.

1277. Chairman.—On the right side?—Preferably on the right side. That is a general statement. Of course, there might be some cases to which it would not apply.

1278. The vomiting might produce asphyxia if you are not watching it?—It frequently does. There have been a large number of cases of that kind, where the anæsthesia has been perfectly satisfactory, the patient has been left, a nurse has been told off to look after the patient, the nurse has kept her finger upon the pulse, she has not observed that the patient is not breathing, she waits until the asphyxia has killed the patient practically, then she finds there is no pulse, and sends for the doctor, and it is too late. That kind of thing has frequently happened.

1279. DR. WILCOX.—And sometimes, without vomiting, the tongue may fall back and asphyxia take place?—Yes. That is an important point; because just as there are these inter-current asphyxial states during the induction of anæsthesia, so there are these states during the recovery from anæsthesia, and the patient requires to be watched just as carefully during the one period as during the other.

1280. CHAIRMAN—The external symptoms are very slight, but they mean a great deal?—Yes; in fact, one might say that the anæsthetist of the present day spends his time, or should spend his time, in looking after the patient's breathing; I mean that one has simply to watch every respiration from beginning to end. That is the true secret of giving anæsthetics.

1281. SIR MALCOLM MORRIS.—There are other theories?—Yes.

1282. What is your view about the Hyderabad theory?—I think it is a very interesting point.

1283. We shall be glad to have your views upon it?—I might say with regard to the Hyderabad theory, if I may call it so, that chloroform is only given to a certain degree and not beyond the point at which the eye reflexes vanish. Up to that point the circulation may be disregarded, but it is frequently necessary, at all events in the surgery of London, to proceed beyond this degree, and then it is very important indeed to watch the circulation as well as the respiration. Watching the respiration applies to all stages of anæsthesia; watching the pulse, as a guide to the effects of the anæsthetic, is only necessary after the corneal reflex has disappeared; and that, I think, harmonises the Hyderabad views with our present conception.

1284. What is the cause of death, then; is it cardiac, inhibitory or respiratory?—Personally, I believe that in nine cases out of ten an element of inter-current asphyxia, often unrecognised, is the responsible factor, the circulatory apparatus, already depressed by chloroform, quickly failing as the result of the suspended breathing.

1285. Do you believe in sudden cardiac failure?—I do not believe that prior to the disappearance of the corneal reflex and whilst respiration is being freely performed chloroform ever

suddenly and primarily paralyses the heart by direct action upon that organ.

1286. CHAIRMAN.—But if you push the anæsthetic far enough?—Then the heart will, of course, cease, but not primarily and suddenly, as is often supposed. Disappearance of the pulse by no means necessarily indicates stoppage of the heart.

1287. SIR MALCOLM MORRIS.—You get poisoning of the centres?—Yes.

1288. Have you followed the experiments of Lord Lister about chloroform?—Yes.

1289. And you know his conclusion as to the extraordinary harmlessness of chloroform?—Yes.

1290. Is there anything special in that, so far as the present day is concerned?—I think that the effect of chloroform upon the heart is quite a secondary matter up to the point at which the eye reflex vanishes and that the essential thing is free lung ventilation.

1291. You think that chloroform, if properly administered, in light anæsthesia is an absolutely safe anæsthetic?—May I put it in this way: I think that, provided respiration be kept perfectly free under chloroform, and that the toxic stage be avoided, it is a very good anæsthetic. I cannot say that it is an absolutely safe anæsthetic, but it is a very good anæsthetic.

1292. Is it more used in Scotland than in England?—Yes, a good deal more.

1293. CHAIRMAN.—There is a Scottish school, is there not?—Yes.

1294. SIR MALCOLM MORRIS.—Why should they use it more in one country than in another; is there any explanation?—It was originally used in Scotland very largely by Sir James Simpson.

1295. You think it is tradition?—Yes.

1296. But surely it must be much more than that now; tradition is nothing nowadays?—Whether the absence of coroners' inquests has anything to do with it, I do not know.

1297. DR. WILLCOX.—Are you familiar with Waller's experiments with chloroform on the heart?—Yes.

1298. Chloroform has a much more powerful action on the heart than ether?—It has.

1299. CHAIRMAN.—A depressant action?—Yes; and it is this action which, in my opinion, explains the rapidity with which patients die under chloroform, if the breathing becomes temporarily suspended.

1300-1. Dr. WILLCOX.—If you record the heart beats of a frog's heart placed in an atmosphere of chloroform, when the heart stops beating it never returns after air is readmitted; with ether it does?—Yes.

1302. CHAIRMAN.—Now, passing from the administering of the anæsthetic, will you tell us this; perhaps it comes in

conveniently here. When a mishap takes place with a patient under anæsthetics, I suppose the mishap will arise from various causes; what are the ordinary causes of death under anæsthetics?—Am I to give my own view on this question?

1303. Certainly.—Personally, I believe that in most deaths under anæsthetics there is an asphyxial factor—what I might call an auto-asphyxial factor; there is some obstruction in the air passages of the patient incidental to the administration which has complicated the anæsthesia, which has brought about the stage of asphyxia, has locked up the anæsthetic in the circulation; and the physical factor is quite as important a one as the anæsthetic factor. In other words, as a rule, it is not a purely toxic effect such as would be produced by passing chloroform below the glottis in and out into the circulation till it caused death by toxæmia, by a poisonously high percentage.

1304. It is partly mechanical?—I believe so.

1305. DR. WILLCOX.—Asphyxia is a strain on the heart?—Yes.

1306. And very often the asphyxia such as you describe will induce cardiac failure which will immediately cause death?—Yes.

1307. Though the main cause, you agree, is the asphyxia?—I quite agree; and the state of the circulation of the patient in my opinion is only of importance in so far as it is able or not able to withstand the asphyxial strain. If a patient has a good normal circulation he will withstand the asphyxial strain, let us say, for four or even five minutes under ether or nitrous oxide. If, on the other hand, he has a feeble circulation and a dilated right heart, then an asphyxial strain of a few seconds may be sufficient to snap the thread.

1308. And if a patient has a fatty heart, a slight asphyxial strain would be very dangerous?—I quite agree.

1309. And the immediate cause of death would be syncope?—The immediate cause of death would be syncope; but from my point of view as an anæsthetist I should say that death was one of asphyxial syncope.

1310. But the heart stops beating as the result of the asphyxial strain?—Yes.

1311. CHAIRMAN.—There is one question I forgot to ask you. Do you get that after-anæsthesia vomiting in the case of nitrous oxide as well as in the case of chloroform or ether?—Practically none.

1312. But after ether or chloroform there are some objective symptoms that you have to watch; there is always a cough or sickness or some objective symptom?—Yes. The recovery from nitrous oxide anæsthesia is immediate and complete, but the recovery from other anæsthetics is in relation to the length of time of their administration; that is to say, that a patient who

has been kept for two hours deeply under chloroform will perhaps remain more or less anæsthetised for one hour after the operation is finished.

1313. Dr. WILLCOX.—And I believe morphia is given before chloroform in some cases?—Yes.

1314. What effect may that have on the duration of unconsciousness after the operation?—A considerable effect; a patient will sometimes sleep for hours after the operation under those conditions.

1315. CHAIRMAN.—Is it advisable generally to give a small dose of morphia before chloroform?—Frequently it is a very useful adjunct indeed; it allows the patient to pass over the most painful part of the recovery period in comparative comfort.

1316. Un-consciously, so to speak?—Yes.

1317. DR. WILLCOX.—It is used more abroad, is it not, than in England?—Yes.

1318. SIR MALCOLM MORRIS.—Would you go so far as to say that it saves some of the tortures of recovery from the anæsthetic?—Yes, it is most useful in that respect.

1319. CHAIRMAN.—I suppose you would give it by hypodermic injection half an hour before the operation?—About a quarter of an hour. I have used it very largely.

1320. Do you ever give nitrous oxide before one of the more prolonged anæsthetics?—Yes, I rarely give ether from the beginning; I give some other anæsthetic, usually nitrous oxide, before it, in order to save the patient the unpleasant taste of the ether.

1321. SIR MALCOLM MORRIS.—And also the struggling?—Yes, it completely eliminates that.

1322. CHAIRMAN.—Is the subject of anæsthetics from the scientific point of view absolutely worked out yet, or is there more to be done?—I think there is still much to be done.

1323. By experiments on animals and observations on human beings?—Yes, I think so. By careful clinical observation I believe that quite as much will be obtained in the way of knowledge as by experimental work.

1324. SIR MALCOLM MORRIS.—In which direction is it going now in the modification of anæsthetics?—I think it is going now in the direction of simplicity.

1325. CHAIRMAN.—Is the actual physiological operation of anæsthetics understood, or do we know only empirically that unconsciousness is produced by certain substances?—That is a very large subject. It is not thoroughly understood. Perhaps I may refer to a few points which may be of interest to the Committee. Snow was a great worker on this subject, and his theory was that all anæsthetics produced their effects by limiting the oxidation processes within the body; and the fact that

anæsthesia may be produced by pure nitrogen (I have actually given pure nitrogen to 20 patients) is very suggestive of the validity of Snow's theory. In order to test the initial phenomena, I myself have inhaled pure nitrogen, and I find that it produces precisely the same subjective effects as nitrous oxide, ether, and chloroform. This is a very remarkable and suggestive fact.

1326. Sir Malcolm Morris.—Including anæsthesia?—Yes. The same thrilling described by Sir Humphry Davy, the same tingling throughout the body and precisely the same kind of dream that I personally get with nitrous oxide are produced by pure nitrogen. Consciousness is lost almost as quickly as under nitrous oxide.

1327. Chairman.—You have taken anæsthetics yourself?—Yes.

1328. For purposes of experiment or as a patient?—For both.

1329. Dr. Willcox.—How long can you keep a patient under pure nitrogen?—With pure nitrogen one rapidly gets asphyxia, but it takes a little longer than with pure nitrous oxide. One can obtain anæsthesia, however, with nitrogen even with 7 per cent of oxygen, which is a very remarkable thing. In this case the inhalation period is longer.

1330. Chairman.—Is the theory correct that, knowing the chemical formula of a given substance, you can say a priori whether it would act as an anæsthetic or not?—That has been stated, but I should not like to make such an assertion.

1331. Dr. Willcox.—If pure oxygen is given bubbled through chloroform, the patient will speedily get under the anæsthetic?—Yes.

1332. But you would not have a diminuation of the oxidation unless you come to the tissue changes?—May I say that what we are accustomed to regard as asphyxia, blueness of features and so on, is a late and gross event; there may be internal oxidation processes interfered with, without manifest indications of asphyxia.

1333. Chairman.—Toxic effects?—Yes toxic effects which are really of an asphyxial type but are not associated with any obvious signs of asphyxia.

1334. Does it come to this; that you may have asphyxia caused either by mechanical means or by toxic gases and vapours?—Yes; when pure nitrogen is given, and all expirations escape, the anæsthesia must be anoxæmic and dependent upon the diminished supply of oxygen to the blood and hence to the nervous system. Anæsthesia may be, and often is, a symtom of moderate anoxæmia.

1335. Now, to come to a more practical point; when you see symptoms of asphyxia, to what means do you resort to restore the patient?—Any obstruction to the entry and exit of air must be removed and air made to enter the chest.

1336. Would you begin with artificial respiration?—No, you must first of all open the mouth and clear the air passages so as to let the air into the lungs.

1337. Practically you do the same as with a person who is apparently drowned?—Yes; but under anæsthesia there are a great many little manœuvres—such as pushing the lower jaw forward, extending the head, passing the finger in and separating the tongue from the pharynx, rubbing the lips briskly—which will often relax a certain amount of spasm of the larynx. There are a great many of these little manœuvres which are frequently necessary in order to maintain a safe and equable anæsthesia.

1338. That all points rather to this, does it not, that it is objectionable if an unqualified person employs his cook or his housemaid to administer the anæsthetic?—Certainly.

1339. DR. WILLCOX.—It is dangerous?—I think it is.

1340. CHAIRMAN.—You can get death at any stage of anæsthesia, I understand?—Yes.

1341. Not only at a late stage but at an early stage?—Yes.

1342. There is another point which you have mentioned in reply to one of our questions: anæsthetics are given in midwifery cases?—Yes.

1343. But they are not given by an anæsthetist, are they?—No, they are not as a rule.

1344. SIR MALCOLM MORRIS.—Except in very exceptional cases requiring special surgical treatment?—Exactly; apart from that they are generally given by the doctor himself or his assistant, or by the nurse.

1345. CHAIRMAN.—In that case I suppose the anæsthetic is not pushed at all?—An attempt is generally made to give it in analgesic doses.

1346. SIR HORATIO SHEPHARD.—Is it more given in Scotland than in England in midwifery cases?—I am not sure; I cannot say.

1347. CHAIRMAN.—Is there any danger in unqualified persons giving anæsthetics in midwifery cases?—I should say that if chloroform was simply given in analgesic doses in midwifery there was very little danger; but the difficulty is to stop it at that particular point. Provided it were not given beyond that point, I should say there was very little danger.

1348. SIR MALCOLM MORRIS.—Is it a good thing to put it into the hands of the patient. The principle is that when the patient becomes unconscious she drops it?—I see no objection to the patient pumping it in by a Junker's inhaler.

1349. SIR HORATIO SHEPHARD.—I have been told that administering anæsthetics to women in childbirth is far safer than in the case of any other operation. What do you say?—That I believe to be so; and there have been many explanations

suggested. I think the best suggestion is that the expiratory efforts made by women in labour help to ward off any intercurrent asphyxia that may arise.

1350. DR. WILLCOX.—Chloroform is given much more frequently amongst the well-to-do classes than the poor in labour, is it not?—I believe that is so.

1351. CHAIRMAN.—Now you have kindly given us some very interesting general information about anæsthetics, and perhaps we may come to the points on which you are more specifically going to speak. Taking the last few years, can you tell us how many deaths occur annually in England and Wales under anæsthetics?—I have brought a small chart which I thought the Committee would like to see *(handing in the same)*.

1352. Is the number increasing or decreasing?—The total number is increasing.

1353. Can you give us any figures?—I have handed round a chart compiled from the Returns of the Registrar-General for the last 40 years, from 1866 to 1905, and from that you will see that the deaths were 155 in 1905 for England and Wales, compared with 5 in 1886.

1354. SIR MALCOLM MORRIS.—Is the area the same?—Yes, the area is the same. This may be quite pari passu with the advance in surgery; it simply shows the total number of deaths registered as having taken place under anæsthetics administered for operations.

1355. And also with the increase in the population?—Yes.

1356. No percentage has been worked out?—No, it is impossible to obtain any such percentage.

1357. CHAIRMAN.—But in certain of our hospitals the percentage has been worked out, has it not?—Yes, but very imperfectly; and personally I attach no importance whatever to such figures.

1358. SIR MALCOLM MORRIS.—In 1897 there is such an odd jump up, and then you drop again the next year. Can you give us any explanation of that?—I know of none.

1359. There is no differentiation here between different varieties of anæsthetics?—No, none whetever. They are all put together; all anæsthetics for operations.

1360. CHAIRMAN.—General anæsthetics, of course?—Yes, all general.

1361. There have been deaths, of course, induced by cocaine?—Yes.

1362. And stovain?—Yes.

1363. Which is a local anæsthetic?—Yes. The Registrar-General classifies anæsthetic fatalities, primarily, under violent deaths; secondly, under accidental deaths and deaths from neglect; and, thirdly, under poisons and poisonous vapours. They come under that third subheading.

1364. Do you mean that they would come under the same heading for his purposes as a case of poisoning by sewer gas?—Yes. I think, if I may say so, it is a most unsatisfactory system of recording.

1365. Have you any suggestion to make as to how deaths under anæsthetics ought to be classified?—Yes, I shall be very pleased to make some. I am talking now of deaths under anæsthetics administered for surgical operations. I think they should fall under four categories. First, all deaths referable wholly to the anæsthetic, as, for example, where the patient dies before the operation is begun.

1366. Does a patient ever die from fright?—Yes.

1367. Some people have a terrible apprehension of an operation?—Yes.

1368. That is always a danger, and a factor which has to be considered?—Yes. Secondly, deaths partly referable to the anæsthetic and partly to the state of the patient, as for example, where the patient is almost moribund from intestinal obstruction and dies whilst inhaling the anæsthetic. There the case is obviously one partly due to the anæsthetic and partly to the patient's condition. Then, thirdly, deaths referable partly to the anæsthetic and partly to the surgical operation.

1369. You mean that the patient suffered from surgical shock even though under anæsthesia?—Yes, and very largely indeed. We get a great many of those cases, and it is unfair to put them down as purely referable to the anæsthetic. Then, again, there may be severe hæmorrhage, and in those cases I think that death should be described as partly referable to the anæsthetic and partly to surgical operation.

1370. You mean that they are concurrent causes?—Yes. Then, fourthly, deaths partly due to the anæsthetic, partly to the state of the patient, and partly to the surgical operation.

1371. SIR MALCOLM MORRIS.—By the state of the patient, you mean the actual state of health, like diabetes or some constitutional disease?—Yes.

1372. CHAIRMAN.—It may be more than that; it may be the result of an accident?—Yes.

1373. You may have a patient brought in who has had a terrible accident, and the only chance of saving life is an operation?—Yes.

1374. SIR MALCOLM MORRIS.—But the state of the constitution ought to be brought out; it is a factor that is left out very often?—Yes it is; there may be some general or local condition in the patient which itself threatens life.

1375. CHAIRMAN.—I suppose, as regards the constitution, a patient may be suffering from some disease which will not be apparent on a mere examination made previously to administering the anæsthetic; there may be no objective symptoms of

that particular disease?—Quite so; and the anæsthetic might, for example, bring about cerebral hemorrhage, or bursting of an aneurism, or the dislodgment of a clot.

1376.—Do you consider that all those deaths under anæsthetics are preventable or not?—No, they are not all preventable.

1377. With the exercise of all human skill and all human care in the administering of anæsthetics, there must always be a certain risk to life?—There must.

1378. But assuming that, in your opinion were many of the deaths that have occurred preventable?—Yes, a large number I regard as preventable.

1379.—Will you kindly tell us what can be done in future, in your opinion, to prevent these unfortunate mishaps?—The first thing I believe that is necessary is that everyone who gives a general anæsthetic should have a medical education; he must, I think, have a proper groundwork of a medical education to prepare the soil upon which to sow the technical seed, so to speak.

1380. You are refering now to general respirable anæsthetics?—Yes, I think that nobody is competent to administer a general anæsthetic, whatever it may be, unless he has had some general medical training.

1381. On that, may I ask, is not provision made now for that special training; have not the General Medical Council recommended it?—No. I mean that a man must be medically qualified.

1382. That is to say (I do not know that it arises just now), we know that dentists administer anæsthetics, and very often successfully. Would there be any objection, in your opinion, to a man who is going to qualify as a dentist going through a course of anæsthetics, and then being allowed to administer nitrous oxide?—That would not be in accordance with my views.

1383. Will you give the reason for that opinion, because it is of importance?—Firstly, nitrous oxide is not suitable for every patient; as I have said before there are certain conditions in which it is specially dangerous; and medical knowledge is necessary to recognise these. Secondly, the successful treatment of such opposite conditions as asphyxia and syncope depends upon medical knowledge. Thirdly, if dentists are to be allowed to administer anæsthetics there will doubtless be a greater tendency to anæsthetise and operate single-handed, which has considerable risks. Fourthly, the need for medical knowledge is well shown by the fact that in practically all of the recorded fatalities in the hands of dentists a medical man was sent for. Lastly, the administrator may have to perform tracheotomy for a patient under the influence of gas, and for that, I think, a general medical knowledge is necessary.

1384. SIR MALCOLM MORRIS.—Has that actually occurred? —Yes, I have myself actually had to perform tracheotomy for the administration of pure nitrous oxide to a patient. It was many years ago, before I gave oxygen as I do now with gas, but I had to do it. It was the first time I had ever done it in my life, but I saved that patient's life by tracheotomy.

1385. CHAIRMAN.—If a dentist was qualified as a dentist and not as a doctor, and the patient had got the permission of his own family physician, would there be any harm in the dentist administering that gas, in your opinion?—I think he ought not to administer it unless he has a medical qualification.

1386. I am presuming that he is an L.D.S.?—I think he ought not to do it; there is no practical instruction in medicine required, for the L.D.S., and no teaching in therapeutics.

1387. DR. WILLCOX.—You regard the anæsthetist as responsible for the preliminary examination!—Yes.

1388. And a dentist would not have the requisite training for that preliminary examination?—That is so.

1389. CHAIRMAN.—Your first point, I understand, is that, as a general rule, as a counsel of perfection at any rate, a general anæsthetic should be administered only by a duly qualified man?—Yes.

1390. What is the next step?—The next thing, I think, is to improve the administrative and teaching personnel at our hospitals; that is to say, to have well-educated men upon the staff at the hospitals to administer anæsthetics and to teach the students how to administer them.

1391. SIR MALCOLM MORRIS.—Is not that the case at some of the London hospitals at the present time?—It may be at some of the London hospitals, but it certainly is not the case in all hospitals.

1392. CHAIRMAN.—You are speaking now of the large London hospitals, not the special hospitals?—I am speaking of the teaching hospitals.

1393. The hospitals to which medical schools are attached? —Yes. I am speaking of the necessity of having men of high academic attainments, such as there are in other departments.

1394. SIR MALCOLM MORRIS.—Is it not so now?—It is not so now. In a great many of our hospitals, I am sorry to say, the anæsthetists occupy quite a subordinate and subsidiary position. They are not even looked upon as on the staff of the hospital, although they are carrying out, in my humble judgment, a function which is quite as important to the public as that of other men who are actually on the staff of the hospital.

1395. DR. WILLCOX.—To be on the staff of a Londor hospital a man has to have the F.R.C.S. or the M.R.C.P., as a rule?—I think so.

1396. Do you think that would be desirable for an anæsthetist?—I think something of that nature would be desirable.

1397. Some higher qualification?—Yes.

1398. CHAIRMAN. Is there anything further you have to suggest?—The third reform, I think, should be that every student should undergo a thorough course of instruction in anæsthetics. At the present time the course of instruction is often inadequate. He should, I think, administer anæsthetics in about 50 cases.

1399. Under supervision, of course?—Yes; and probably half of that number should be cases of nitrous oxide. At a great many of our hospitals now there are dental departments. If there are not, there are special dental hospitals, and arrangements might easily be made so that all medical students should have a thorough training in administering anæsthetics, including nitrous oxide.

1400. Because a man in general practice in the country, of course, may at any time be called upon to administer anæsthetics?—Yes.

1401. And under very difficult conditions?—Yes.

1402. Take the case, for instance, of a man who has a limb badly crushed in agricultural machinery. I suppose that the doctor who is called in may have to administer anæsthetics and also take off the limb?—Yes, that might conceivably happen.

1403. Doing it as best he can?—Yes. Then fourthly, the degree-granting and diploma-granting bodies should all make it obligatory for a proper course of instruction to have been received.

1404. That is to say, they should require a certificate from a school that the man seeking the qualification has passed a course in anæsthetics to the satisfaction of his teacher?—Yes.

1405. Would you apply that to the L.S.A. qualification?—Yes, to every medical qualification.

1406. DR. WILLCOX.—I think it is fair to say that many of the London medical schools insist on all their students going through a good course of anæsthetic training before they are allowed to go through the examinations?—That is so at several of the hospitals. There is one thing that, I am sorry to say, I admitted. Talking of improving the personnel of the hospitals, I think it is very desirable that anæsthetics in those hospitals should be administered by specially qualified anæsthetists, that is to say, by those who have had some special course of instruction, or who are either resident anæsthetists or occupy some position entitling them, so to speak, to take on that particular function. That, I think, is only right in the interest of the public who go to those hospitals; but it also helps to send out into practice eventually men who in provincial towns will be able to give anæsthetics to the satisfaction of the surgeons in these towns.

1407. CHAIRMAN.—Perhaps I have not appreciated your point. It comes to this, does it not: that you ought to have a

special anæsthetist staff in the hospitals to train up students?—Yes.

1408. Sir Malcolm Morris.—How would you get the anæsthetic administered by the special anæsthetist in a case that comes in late at night; is it not the custom now for the house surgeon on duty to administer the anæsthetic?—Very often; but at a good many hospitals now there are resident anæsthetists.

1409. Is it conceivable that he might be occupied?—He might, but it would be his primary function to be on duty for an emergency.

1410. He might be occupied on one case. How about a second or third?—There might be a proper rota, so that in his absence he would be represented by a house surgeon who had had special experience in giving anæsthetics.

1411. Chairman.—You cannot, of course, make any provision for extraordinary cases of sudden accidents, in which you must do the best you can?—That is so.

1412. Dr. Willcox.—But you think that it is very important that there should be an adequate staff of resident anæsthetists at the hospitals?—Yes, I might say in this connection that when I went to the London Hospital in 1886 there was one operating theatre; there are now five. I mention that only as pointing out the enormous advances that have been made in the number of operations; and of course to cope with them this department ought also to advance, whereas, as a matter of fact, it is very much behind. Surgery has been going forward, and this department has been lagging behind.

1413. Chairman.—Now, to pass to another point, can you give us any statistics as to the use of anæsthetics by persons possessing no medical qualification?—I must say, first of all, that it is very difficult to obtain reliable statistics, because a certain number of these cases of deaths under anæsthetics are not reported, this is particularly so in private practice; but I find in 21 years, from 1888 to 1908 inclusive, 13 deaths recorded as having taken place in the hands of non-medically qualified dentists. In six of those cases nitrous oxide was the anæsthetic.

1414. Six out of 13?—Six out of 13.

1415. Does a dentist, as a rule, use any anæsthetic beyond nitrous oxide—chloroform or ether?—Yes, sometimes chloroform or ether. The important thing about these cases is that in 11 of the 13 for certain, probably almost certainly in 12, but anyhow in 11, the same man who gave the anæsthetic also operated.

1416. It is rather difficult, is it not, to watch properly the breathing of the patient for symptoms of asphyxia while pulling out a tooth or performing some operation on the jaw?—Yes; I regard that as a very important fact. Although there were not many of these deaths, yet the fact seems to me to indicate that if

dentists are to be allowed to give anæsthetics without having a medical qualification, a great temptation will be thrown in their way of operating at the same time that they are giving the anæsthetic, as in these cases.

1417. DR. WILLCOX.—If a man operates and gives the anæsthetic, he is more likely to give an overdose in case the patient should come round too soon?—Yes, and he is also more likely to allow fragments of teeth and other things to get into the air passages. I have heard of cases where the patient has died afterwards with pulmonary symptoms; there has been no post-mortem examination, perhaps, and no inquest.

1418. CHAIRMAN.—I may take it that you consider that patients who are anæsthetised by non-medically qualified persons run considerably greater risk than those who are anæsthetised by a qualified medical practitioner?—That is so.

1419. And I may take it that whenever it is possible the anæsthetist and the operator should be different persons?—Yes, I think that is very important.

1420. But you will agree that there are many cases where time is of the utmost importance, and where the medical man has to do the best he can?—Yes, it is obviously better, of course, for a qualified medical man to administer the anæsthetic single-handed than for an unqualified medical man to administer the anæsthetic single-handed.

1421. From what you have already stated, I gather that you consider that in the case of dentists, which is perhaps the most important one, they should not administer even nitrous oxide?—That is my view.

1422.—Nitrous oxide, during the short time for which it lasts, having the like dangers with chloroform or ether.—No, I do not say that. Nitrous oxide is a comparatively safe anæsthetic, but at the same time there are certain conditions in exceptional cases in which it is an unsafe anæsthetic.

1423. It would not be sufficient, you think, if a dentist were allowed to operate under nitrous oxide if the patient brought a medical certificate that he was fit for the anæsthetic?—No, I think that might be of very little value, because conditions might have changed.

1424. DR. WILLCOX.—The anæsthetist must be responsible for the condition of the patient at the time.—Yes.

1425. CHAIRMAN.—Now we come to a very practical point. Do you think that the prohibition of the practice of administering anæsthetics by future registered dental practitioners would result in any real hardship to the dental profession?—No; the registered dentists at present in practice could have no grievance, whilst the proposed legislation in future would have a tendency to raise the status of the dental profession, because it would help to stop quack practice.

1426. You mean practice by unqualified dentists?—Yes, it would help to stop quack practice, that is to say, the practice of dentists who have no dental qualification at all—who are not on the register.

1427. Does that include foreign dentists who come over here; how can they get on the register?—I am not sure whether it is possible for some of them to get on the register, but there are a good many dentists who practice in this country without being on the register. Such a dentist can now get another dentist who is also unregistered to give the anæthetic for him. If it were illegal for anyone but a qualified medical man to give the anæsthetic, it is obvious that the practice of these unqualified dentists would become more limited—for the General Medical Council already forbids registered medical practitioners administering anæsthetics for unregistered dentists, and if the proposed Bill became law no other person could act in this capacity. The result of this would be the gradual elevation of the dental profession.

1428. My difficulty is the question of cost. Anæsthetists, like other people, I suppose, will not work for nothing.—No, but just as there are small fees in the country for medical attendance, there would be small fees in the country for giving anæsthetics. In provincial towns it would be possible for dentists to have gas given on certain days of the week, when it would be worth a medical man's while to come in and take a considerable number of small-fee cases at one time, whilst in cases of urgency, with a patient in pain, a medical man would, I am sure, attend if asked by the dentist who regularly worked with him. There is always a medical man near a dentist, but there is not always a dentist near a medical man.

1429 I was thinking of the very poor?—The very poor would go to the hospitals, where there are usually dental departments.

1430. That is all right for London; but how about the country?—In villages there are no dentists, of course, at the present time, and the medical men act as dentists; so that there would be no hardships to dentists there; and in small towns, as I have said, there are medical men who would be properly equipped to give nitrous oxide.

1431. I suppose that practically anæsthetics for ordinary dental operations are only given to a class of patients who can afford to pay for it, but a very poor person who requires anything like a serious operation is sent to the nearest hospital?—Yes.

1432. Sir Malcolm Morris.—Take those various advertisements you see about painless dentistry; how is it done then; do they administer the anæsthetic without medical men?—They can do so. There is nothing to prevent a quack dentist giving an anæsthetic. In fact, in one of the 13 cases chloroform was

given by a herbalist to a perfectly healthy young woman, and she has died; and in another case ethyl-chloride was given by a quack dentist who did not even know what "5.c.c." meant.

1433. CHAIRMAN.—I think the next point is, do the present arrangements ensure the holding of an inquiry in all cases of death under anæsthetic?—They do not.

1434. Will you give your reasons for that?—I think it has been shown by some of our coroners that, owing to imperfect systems of death notification, these cases may be entered up as having had other causes.

1435. Heart failure?—Heart failure, syncope, shock, and other causes.

1436. In your opinion, in every case of death under anæsthetic should there be a scientific inquiry; would it have any good results in tracing out the actual cause of death and considering how far the death was preventable?—May I ask you what you mean by a scientific inquiry?

1437. I mean an inquiry conducted, in the case of a hospital, say, by the scientific staff of the hospital, and in the case of a coroner, before the coroner, assisted by a medical expert?—I think there should be such inquiry in every case in which the patient dies under an anæsthetic. It may possibly be a difficult matter even for an expert to decide how a patient has died under an anæsthetic, but it is quite impossible in the absence of expert opinion to arrive at any reliable conclusion as to the precise cause of death.

1438. I was coming rather to this point. Taking coroners' juries, such as they are now all over England, do you think that the coroner should be assisted by somebody in the nature of an assessor; or do you think that he can rely upon such experts as may be called as witnesses?—I think that in the case of death under anæsthetics, the opinion of someone who has had large experience in the administration of anæsthetics should in some way be obtained.

1439. Either by evidence or by having an expert sitting as assessor?—Yes.

1440. Have you any preference for either method?—I am afraid I am not competent to answer that question.

1441. MR. BRAMSDON.—I want to ask you a question upon the point that the Chairman has just put to you. Would you not consider that under ordinary circumstances the coroner by himself would be able properly to conduct such an investigation?—I think not.

1442. I am speaking not of the cause of death but where death arose from anæsthetics?—I am afraid in looking over all the deaths that I have looked over, I see no evidence of the true facts having been put before the coroner in a large number of cases.

1443. CHAIRMAN.—Or elicited by the coroner?—Or elicited by him.

1444. MR. BRAMSDON.—But a coroner's inquest is not a scientific inquiry, is it?—No, it is not.

1445. It is to ascertain generally the cause of death and to see whether anyone has been guilty of crime and, therefore, should be tried for it?—Yes.

1446. Under ordinary circumstances the coroner would be able to conduct that inquiry?—So far as the absence of any criminal intent is concerned, I think so.

1447. That is the object of the coroner's inquiry?—Yes.

1448. CHAIRMAN.—How about negligence.

1449. MR. BRAMSDON.—If it is culpable negligence it is a crime?—I think very often there has been some negligence which has not come to light owing to the absence of technical evidence.

1450. But is it not the practice of coroners, where they anticipate some technical inquiry, to get an assessor to them at the present time?—No I do not think so.

1451.—In very serious technical cases where sufficient reason has been adduced, is it not possible to get an assessor?—I am afraid I do not know.

1452.—Do you think that the matter as between life and death is of sufficient importance to have some additional scientific inquiry beyond that which is ordinarily afforded at a coroner's inquiry?—I do. I may, perhaps, instance a case, and it is only an instance, to bring this to a point—the case I referred to just now of a patient who has come round from the anæsthetic, and is then left to look after himself, so to speak, while he is still unconscious. I must say, and I am sorry to say it, but I am obliged to say that if such a death occurred I should look upon someone as negligent.

1453.—CHAIRMAN.—Not criminally negligent?—No, not criminally negligent, but technically negligent.

1454. MR. BRAMSDON.—Are you suggesting some other inquiry than the coroner's inquiry?—No, I do not make any suggestion. I am not competent to do that. I only say that what one wishes to do is to get to the true cause of death in these cases.

1455. But I am afraid I must repeat to a certain extent my question: do not you think it possible, or even probable, that the coroner, if he is properly advised with proper assistants, might be able to effectually arrive at a proper conclusion in cases of that kind?—I think not without the assisstance of someone who had specially worked at anæsthetics.

1456. Following on to Dr. Willcox's question, could he not call expert witnesses to satisfy him?—He might, I suppose; but I think an expert assessor would best meet the case.

1457. You will agree that coroners have many and difficult

subjects to inquire into in the course of their career?—Yes.

1458. Would not your argument equally apply to many other cases?—Yes.

1459. And as the coroners apparently, on the whole, seem to have got through their duties fairly well, is it not fair to assume that they might get through their duty equally well on this subject?—I think they might with the best advice.

1460. That I agree?—But it must be by special technical knowledge brought to bear in order to elicit the true and immediate cause of death.

1461. Which a coroner can gather to his assistance, can he not?—Possibly, but I am not really competent to answer that.

1462. With reference to dentists, do you know how many dentists there are in the United Kingdom?—I believe there are about 5,000 registered dentists in England and Wales.

1463. And do they administer this nitrous oxide freely?—Yes it is largely used.

1464. You could not form any judgment as to the number of administrations in a year?—I think not.

1465. Would they be tens of thousands?—I should think very likely they might be.

1466. To whom do these 13 deaths refer?—To non-medically qualified dentists; that is including both those who are not on the register and those who are.

1467. And those who are on the register, you say, were non-medically qualified for this purpose?—Yes.

1468. Thirteen deaths, over 20 years, under circumstances like that, would not be a great number, would it?—It is, I think, admitted that statistics, so far as numbers are concerned, are very unreliable. I attach more inportance to the nature than to the number of these fatalities.

1469. Then, on the whole, existing dentists have administered this nitrous oxide with fairly satisfactory results?—Yes, that is so.

1470. But your suggestion is, of course, to avoid any possible question that may arise?—My suggestion is to go to the root of the matter.

1471. The whole of these anæsthetics are deadly poisons, are they not?—Yes.

1472. And, therefore, a person under an anæsthetic is really under the influence of a deadly poison?—That is so.

1473. Requiring the greatest possible care in its administration?—Yes.

1474. As you remarked, from beginning to end?—Yes.

1475. Are there other anæsthetics besides those that you have mentioned to which similar remarks apply?—Yes.

1476. On the whole, which anæsthetic is mostly administered?—Do you mean for all operations?

1477. I mean generally.—I think chloroform. I should have said nitrous oxide if you include dental practice.

1478. I meant to leave that out?—Excluding dental practice, I should say chloroform.

1479. Am I right in understanding that on the whole, and with proper care, the administration of anæsthetics is fairly safe, administered of course, by a competent person, I mean?—I should say that everything depended upon the capabilities of the anæsthetist.

1480. You and I mean the same thing, I think. The administration of anæsthetics by a properly qualified person is on the whole fairly safe?—I quite agree.

1481. But in the converse case, in the hands of ignorant or negligent persons it is very seriously dangerous?—I agree.

1482. I suppose you have no means of letting us know the proportions of deaths from the different anæsthetics?—I do not think that anyone can answer that question.

1483. It is a fact, is it not, that the practice of coroners varies as to holding inquests in cases of deaths under operations?—Yes, it is.

1484. And those deaths are frequently mixed together with deaths under anæsthetics?—Yes.

1485. And there are many cases in which inquests are not held?—That is so.

1486. Which reduces the number of cases to which you are able to refer?—I take it, of course, that if an inquest is not held then the ordinary death certificate is sent to the registrar, and the practitioner may or may not have been able to give an accurate account of the cause of death.

1487. Sir Malcolm Morris.—Who would give the certificate?—I believe the patient's ordinary medical practitioner, but I am not certain.

1488. Mr. Bramsdon.—What I mean is, do you know of your own knowledge of cases where a certificate has been given when the death may have been due to the effects of the operation or the anæsthetic, or the operation and the anæsthetic combined, in which neither the operation nor the anæsthetic has been referred to?—Not in my own personal experience; but I do know that there have been such cases.

1489. You have reason to believe that there are such cases?—I have every reason to believe that those cases are not uncommon.

1490. With regard to the draft Bill which we have before us?—Yes.

1491. Does it correctly meet your views as to what is desirable in the shape of a Bill?—Yes.

1492. So that one person can administer the anæsthetic and perform the operation?—Under certain conditions.

1493. I mean that legally there is nothing to prevent its happening?—Legally there is nothing.

1494. Supposing this Bill becomes law, I mean?—That is so, because one has to provide for doctors in the country, who are called upon suddenly to meet such emergencies.

1495. And you do not suggest, for the purpose of legally dealing with this matter, anything further?—No.

1496. Do you think these words are all necessary? Do you think they go beyond what is the usual practice?—I think they are necessary.

1497. That is to say, "inhalation or otherwise any drug or substance, whether solid, liquid, vaporous, or gaseous, and whether pure or mixed with any other drug or substance"?—Yes.

1498. You think they are all necessary?—I think so, because they are meant to provide for any possible contingency in future. A drug might be discovered that was a solid anæsthetic, and it would then be included.

1499. SIR HORATIO SHEPHARD.—The Bill as it is drafted goes beyond the question of the administration of chloroform and such like things; the expression is "to be administered to any other person by inhalation or otherwise any drug," &c.—would that cover morphia?—No, because that is not given by inhalation, and it is not given with the object of producing unconsciousness for any medical or surgical operation, act, or procedure.

1500. It would cover stovain?—No; it applies to general anæsthetics or agents given with the object of producing unconsciousness.

1501. It does, but stovain is used, for instance?—As a local anæsthetic, not for producing generalised insensibility. The Bill is a Bill for regulating generalised anæsthesia.

1502. It might be explained by an interpretation clause, then?—Yes.

1503. CHAIRMAN.—Would not the Bill meet with less opposition, and would it not raise less points if for the present you confined the Bill to general anæsthetics, and defined general anæsthetics simply as general respirable anæsthetics?—They are defined in the memorandum to the Bill.

1504. SIR HORATIO SHEPHARD.—The Bill itself leaves it rather obscure?—It does; but the idea was to make it as concise as possible.

1505. CHAIRMAN.—But you can make it more concise if you use the expression "general anæsthetics," and then add the interpretation "general respirable anæsthetics"?—Some anæsthetics may be given, and have been given, by the rectum. The term "respirable" would therefore not be sufficiently inclusive.

1506. Passing from that, how would you propose to obtain reliable statistics as to deaths under anæsthetics?—I think that

in some way or another all hospitals should hand over their statistics of normal administrations, or those statistics of normal administrations should be obtained from them, so that it would be possible to say in those hospitals that during a certain number of years so many anæsthetics had been given with so many deaths under ether, under chloroform, or under other anæsthetics; and in that way we should be able to watch the effects of any reform that we might introduce.

1507. Would you require any returns from private practitioners?—I do not think it would be possible to get them. I think it would be very much better to utilise the returns from our hospitals.

1508.—To what authority do you suggest they should be sent—to a State authority or to a medical authority?—Personally I think that if the hospitals were invited to send returns they would do so.

1509. But to whom should they be sent?—To the Registrar-General, so that he would be able to draw up a table showing that at certain large hospitals so many anæsthetics had been given during the year, and so many of the deaths referred to in his main table had occurred at those institutions, and that would act as a means of obtaining the death rates and watching the death rates under different anæsthetics. I may say that I have not carefully thought out the actual machinery of this, but the principle is that the hospitable statistics should be utilised for this purpose.

1510. There is no medical society, like the Royal Society of Medicine, that has attempted anything of the kind?—No, I think not.

1511. You do not think that they would be a better body to do it?—I am afraid I cannot answer that question.

1512. Is there any further point you would like to bring before us?—I think not.

1513. Sir Horace Shephard.—With regard to what Mr. Bramsdon asked you, do I rightly understand that you think that some tribunal other than the coroner would be the best to arrive at a satisfactory conclusion as to which class a death from anæsthetics should be referred to?—I think that there should be an assessor to the coroner who should have had a special experience in administering anæsthetics, and that the coroner should decide whether, in his opiniou, it is necessary to hold a full inquest with a jury. A great many of these cases might be settled with such an assessor and with other expert evidence, such as that of an expert pathologist, but without a jury. I think this would have a threefold advantage. In the first place it would not be quite so public; that is to say, there would be less chance of the Press taking up these cases and alarming the public by their publication; secondly, unnecessary

distress to relatives and others would be avoided; thirdly, the evidence obtained would be much more serviceable, much more valuable, and much more scientific.

1514. CHAIRMAN.—As a warning for the future how to avoid mishaps?—Yes.

1515. SIR HORATIO SHEPHARD.—You would not take it away from the coroner altogether?—No, not altogether, but, as I say, I think it would be rather better not to have a jury in such cases.

1516. SIR MALCOLM MORRIS.—But you think there should be such an enquiry in every case of a death from anæsthetics?—In every case there should be an enquiry, and certainly a post-mortem examination.

1517. CHAIRMAN.—In the case of a death under anæsthetics, does the post-mortem show the cause of death?—Not necessarily; in fact, usually not, but without a post-mortem one cannot be certain that the death may not have been from natural causes.

1518. From cerebral hæmorrhage, for instance?—Yes, and that must be excluded before the cause of death can be attributed to the anæsthetic.

1519. SIR HORATIO SHEPHARD.—The difficulty, as I understand, that Mr. Bramsdon had in his mind was, that an inquiry such as you suggest would be going beyond the proper functions of the coroner. It does not matter to the coroner under which of your four heads it is put, although from a scientific point of view it is exceedingly important?—Yes, but some coroners have expressed their views as to how patients have died under anæsthetics, and have criticised the systems at present in force; and under such circumstances it seems to me that we must supply them with proper evidence.

1520. But if the tribunal, whatever it is, has to go into these questions, that rather points, does it not, to some tribunal other than the coroner?—Yes, I think that is a very important matter.

1521. CHAIRMAN.—As the law stands at present the coroner has to supply the Registrar-General with the exact cause of death, has he not?—Yes. This is part of a very wide question, as to whether deaths under anæsthetics are really unnatural deaths, and if they are, whether deaths from operations should not also become the subject of a coroner's inquest. That, I am afraid, I am not prepared or competent to deal with; but dealing with the law as it at present stands, provided that the coroner has to inquire into these deaths, the lines I have suggested, I think, would be most suitable.

1522. There is one question I forgot to ask you. Has the Section of Anæsthetics of the Royal Society of Medicine expressed itself as favourable to the proposals of the Bill?—Yes.

1523. Has it been brought before the general body of the Society?—It has. I think a resolution was sent up to them, and it rests with the Council at the present time.

1524. Have the Royal College of Surgeons and the Royal College of Physicians been consulted in any way as to this Bill? —Not officially, I believe.

1525. Have you had any communication with the Scottish or Irish authorities? Have they expressed any opinion on the Bill, because the Bill would apply, of course, to the whole of the United Kingdom?—No, I think not.

1526. You do not happen to know, do you, whether in any foreign country there are restrictions on the use of anæsthetics by unqualified persons?—Curiously enough, in last week's *British Medical Journal* I noticed that the German Government are at the present time promoting a Bill restricting unqualified practice, and amongst the various things that are under consideration is this question of general anæsthetics. It is proposed to include general anæsthetics in that Bill, so that they can only be administered by qualified persons.

1527. Mr. BRAMSDON.—We regard you, of course, on this subject as being at the head of the profession?—It is very kind of you.

1528. I do not know whether you can give me some more information upon this point. You told us that you had administered anæsthetics in over 3,000 cases in one year without a fatality?—Yes.

1529. Might I go a little further than that? Can you give us any idea in how many cases you have administered anæsthetics in hospitals?—I am afraid I cannot.

1530. Would it be many thousands?—Yes, many thousands. I have kept no record of the actual number.

1531. I do not know whether I am asking too much if I ask you whether you have ever had a mishap at all in those hospitals? —During the whole time that I was at the London Hospital I had no mishap, and I was there 15 years; and I have not lost a patient under anæsthetics for 19 years.

1532. Was that in hospital?—I am now including all cases.

1533. So that with skill and care the proportion of deaths under anæsthetics would be reduced to a minimum?—I believe so.

1534. As a coroner, I am rather interested in this point. Do I rightly understand that the post-mortem appearances in these cases are usually those of asphyxia?—Frequently they are.

1535. You would not say usually?—No, I would not say that; but unfortunately it does not follow that because a patient has died from asphyxia that signs of asphyxia are found; and I am told—I speak under correction now, but I am told by eminent pathologists—that it is often impossible, in fact usually impossible, to say from the post-mortem appearances whether the patient has died from syncope or from asphyxia.

1536. May I just follow that up. Supposing that a post-mortem examination was held on the death of a person who has

died from the administration of chloroform, what particular appearances would you expect to find?—I should say that there were no post-mortem appearances which would indicate that the death took place simply and solely from the toxic action of chloroform.

1537. Then how could you come to a definite conclusion as to the cause?—From the absence of other causes of death, and from the description of the symptoms of the patient at the time of the death. That is to say, in all these records of deaths under anæsthetics, the symptoms observed and noted have a definite significance to anyone who is accustomed to meet with difficulties under anæsthetics.

1538. I wish you would tell me what those symptoms are?—Very often, of course, there are evidences of obstructed breathing, the patient becoming blue in colour or very stertorous in breathing.

1539. That is during life?—I am talking of during life.

1540. I was asking as to the post-mortem appearances?—I do not think my opinion is of much value there, but, so far as I am aware there are no characteristic appearances in death from anæsthetics. Of course if a patient has died simply and solely from asphyxia, say, under nitrous oxide gas, the right side of the heart is generally found very full and the left side empty, which are the ordinary signs of simple asphyxia; but in a great many cases there are not those signs.

1541. Have you any experience of post-mortem examinations under such circumstances?—I have not had much experience of post-mortem examinations after anæsthetic fatalities.

1542. Perhaps, then, you would hardly be able to express a sufficient opinion?—I think I should consider myself as incompetent.

1543. I think you have already answered this question. When a patient is under anæsthetics he requires continuous watching from commencement to finish?—Yes, continuous watching.

The witness withdrew.

Mr. Dudley Wilmot Buxton, M.D., B.S., M.R.C.P., examined.

1544. Chairman.—I believe you are Anæsthetist to University College Hospital?—I am, and I am also Consulting Anæsthetist to the National Hospital for Paralysis and Epilepsy, Queen's Square, and Senior Anæsthetist to the Royal Dental Hospital.

1545. And you are a past President of the Society of Anæsthetists?—Yes.

1546. And for many years of your professional life you have devoted yourself to the administration of anæsthetics?—I have.

1547. What is your opinion as to deaths under anæsthetics coming under the heading of unnatural deaths?—That is rather a difficult question for me to answer. I can only say that lawyers with much more authority than I have are doubtful upon the point.

1548. Some coroners, I believe, hold that it is their duty, in every case of a death under anæsthetics that is reported, to hold an inquest, while other coroners hold that they have a discretion?—Quite so. I take it that no death is natural except when you die in your bed from old age; a man who even dies from measles dies an unnatural death.

1549. But still you have more human intervention in the case of a death under anæsthetics?—In some cases, yes.

1550. SIR HORATIO SHEPHARD.—How do you distinguish between that and an operation?—Deaths after surgical treatment are probably "unnatural" deaths, as are also those of patients under any form of medical treatment.

1551. CHAIRMAN.—Do you know what is done in Scotland?—I know this much, that they have a private inquiry by the Procurator Fiscal.

1552. Does that work well, so far as you know?—I believe so.

1553. Is there any special means by which he gets expert advice and help?—I believe that he can call in an assessor—whether he does so in all cases I am not sure, but I am under the impression that he always has an assessor.

1554. When an inquiry takes place into a death under anæsthetics, I think you say that there are two distinct questions involved?—Yes, I have put it in that way.

1555. Would you say what they are?—My first heading is, whether the death was actually due to the anæsthetic.

1556. Due to it with or without other causes?—Yes. Then a further question is: was the anæsthetic given for a lawful purpose and by a person qualified to administer it?

1557. In your opinion are the existing coroners' courts a satisfactory tribunal for dealing with those two questions?—If I may say so with submission to those who are present, I should say, as a rule, no. They may be in capable hands, but you cannot legislate for everybody, and in some cases the inquiry is a farce.

1558. What would you suggest as a better inquiry into the cause of these deaths?—I think that there ought to be someone, either an assessor or an expert present, to assist—either an officer like the Procurator Fiscal or the coroner.

1559. Do you think that a jury is of any use or not in these cases?—They are quite useless. The advantage of having the Procurator Fiscal is that he would probably have a wider experience in all cases brought before him, and he would get the hang

of the thing better than a man who has comparatively few. I do not, of course, mean to say for a moment that many coroners do not do their work extremely well, but they do it without regard to the jury; they tell the jury what verdict to come to.

1560. We know that there are some 360 coroners, and we also know that some of them receive the magnificent salary of £4 a year?—What can you expect.

1561. The jury, of course, naturally have no knowledge of the medical questions and medical terms, and the proceedings in a delicate inquiry of this kind must be absolute Greek to them? —Absolute Greek.

1562. So that the whole matter turns on what the coroner says to them?—Entirely.

1563. Therefore, the coroner by himself would be a more satisfactory tribunal?—Much more satisfactory, but it would depend upon the coroner's knowledge.

1564. Especially, in your opinion, if he was assisted by a medical assessor?—Yes, with adequate knowledge of the subject.

1565. An expert assessor?—Yes.

1566. Would there not be this difficulty about an expert assessor? You have got about 360 coroners, and you would require a considerable body of men available for going about the country if you are to have an expert inquiry in each case of death under anæsthetics?—Of course, without the figures before one, one would not know how much time would be involved in it. It is a question, of course, whether all cases would have to be inquired into. The duty of the coroner I believe is to ascertain the cause of death. If this involves crime the jury return a verdict in that sense. In most cases of deaths under an anæsthetic the issue is clear, and the question of crime is absent. An informal inquiry made by the coroner with expert help such as most hospitals could supply, or made by some person expert in such cases, and reporting to the coroner, would rapidly establish the nature of the case, and avoid the waste of time and public money incident to the present system, and would abolish the garbled newspaper reporting, which is undoubtedly a danger to the public. Such a scheme would save the coroner's time as well as that of other people. If the evidence was unsatisfactory the formal inquest could be held. On one occasion a death occured, and as the patient had had an anæsthetic an inquest was held. The patient had succumbed to a severe operation, and no question of poisoning by the anæsthetic was present. This fact had been communicated to the coroner before the inquiry. However, the inquest was held, and everybody connected with the case, except the surgeon, who was really the chief person concerned (although not in any sense open to blame) was subpœnaed! That case was put to the jury as a death from the anæsthetic, but the coroner was reminded of the medical

evidence, and then advised a verdict more consistent with the facts of the case. I have heard of several similar cases, and these indicate to my mind that coroners do not as a rule possess sufficient technical knowledge to make them the best judges in such inquiries. I hold also that these public enquiries into deaths under anæsthetics are unnecessary and involve vexatious loss of time to hospital authorities, and a waste of public money.

1567. You mean that if the coroner by a preliminary inquiry decided that it was not necessary to hold an inquest, you would not then require the assistance of a medical assessor?—That is so.

1568. Have you any opinion upon this point about which Dr. Hewitt has been telling us—whether unqualified persons ought to be allowed to administer anæsthetics?—What do you mean by "unqualified"?

1569. First of all, take the pure layman (I exclude the dentist for the moment), the bonesetter, the herbalist, the amateur doctor, and the quack?—It is extremely dangerous. They ought not to be allowed to do it.

1570. The risk to the patient is great, you think?—Great.

1571. Is it your opinion that, as a general rule, when it is possible, the person who administers the anæsthetic and the person who performs the operation should be different persons?—Certainly, I feel strongly upon this point.

1572. That is to say, that while the attention of the anæsthetist is required to be fixed on the effect of the anæsthetic on the patient, the surgeon has to attend to his own special work?—He should do so.

1573-4. I may ask you, with regard to dentists, do you agree with what Dr. Hewitt said on that point, that only medically qualified dentists should be regarded as qualified men in the sense that they should be allowed to administer nitrous oxide gas, not ether or chloroform?—I think it would be a hardship on the men themselves and a great inconvenience to the public if they were not allowed to do it. I think also that it would lead to their employing other agents, which I think would probably be more dangerous.

1575. You refer to local anæsthetics like cocaine?—Yes, and it would probably lead to worse results than their using nitrous oxide.

1576. Sir Malcolm Morris.—What qualification are you thinking of?—The L.D.S. I think would be a sufficient safeguard, if they were properly taught.

1577. Are they?—Oh yes, as a rule. I think that point ought to be made clear. That is why I think it is most important that the second part of the Draft Bill which has come before you at the instance of Dr. Hewitt should be emphasised. I understand that the feeling is to drop it. I think it is the most important of

the two—the education clause; because, obviously, if you restrict the giving of anæsthetics to a certain body of men you do so upon the assumption that those men are capable of doing the work and are properly educated. A medical man, as a medical man, is no more fit to give anæsthetics than a porter at his office, unless he has had a special training and teaching in the methods of using anæsthetics.

1578. CHAIRMAN.—Dr. Hewitt had two points on that, upon which I should like to know your opinion. In the first place, we put to him the case of a dentist receiving instruction in the administration of anæsthetics, and he said, "Well yes, you could teach no doubt the class of dentists to administer anæsthetics, but they would not have the necessary medical training to determine beforehand whether the patient was fit to receive the anæsthetic, and what anæsthetic it was right to employ in that particular case."—What do you say to that?—I think that is met in this way. In the large majority of cases, if the patient is at all not strong, and it is likely to have any bad result, the medical man in the case would warn the patient, or would warn the dentist. As a matter of fact, nitrous oxide is such an extremely safe agent that I think there is no danger of any trouble arising from its use.

1579. Dr. Hewitt mentioned to us nine cases of deaths under nitrous oxide administered by dentists, in which he said, I think, that in all the cases the man who administered the anæsthetic was himself also the operator: what is your opinion with regard to that?—I think it is a wrong system. I think that no one, whether a medical man or a dentist, ought to operate under those circumstances.

1580. He might be obliged to do so in exceptional cases?—That is so.

1581. But dental operations not being very urgent ones, you think that no dentist ought to be allowed himself to administer the anæsthetic and also to perform the operation?—I quite agree to that.

1582. Then if one man is to do the operation and another man is to administer the anæsthetic, is it not better to have a qualified medical man to administer the anæsthetic?—It is better—but you cannot always get him—provided always that the medical man knows how to administer it. In many cases the ordinary medical man knows less about giving gas than a dentist does.

1583. You think that nitrous oxide on the whole is a very safe anæsthetic?—Yes, I think so. It is given an enormous number of times by Tom, Dick, and Harry without any bad results.

1584. You yourself, no doubt, are perfectly familiar with the administration of nitrous oxide?—Yes.

1585. Do you use it constantly?—Yes, I have used it hundreds of thousands of times.

1586. And you think that no special skill is required in administering it?—Certainly, some special skill is required, but I think it is easily acquired.

1587. DR. WILLCOX.—Do not you think it is better for the anæsthetist to be personally responsible for any fatality to a patient who has taken an anæsthetic?—Certainly.

1588. CHAIRMAN.—But you do not think it is practical in the case of the poor?—No, I think not in the case of the poor, and in remote districts.

1589. You think that one cannot legislate for counsels of perfection, but must legislate for ordinary conditions of life?—Quite so. I have no doubt that the ideal thing is to have Dr. Hewitt to give gas to everybody.

1590. Or Dr. Dudley Buxton. In your précis of evidence which you have kindly given us, you say that a case of death under anæsthetics is a case for a court of experts, and that most of the cases that are decided at present as deaths due to anæsthetics would by scientific investigation be shown to have been deaths under anæsthetics, and not due to it?—Yes, in many cases.

1591. And that you say could only be elucidated by an expert inquiry?—I say best elucidated.

1592. Would it meet your views if the coroner held his present inquiry for what I may call the rough and ready purpose of seeing whether anybody was to blame, and if some scientific inquiry was held into the other matter?—Quite, provided the inquiry was merely into the question of fact—the cause of death, and without a jury. I also think it would be made best in camera.

1593. For instance, by experts on a hospital staff?—Yes.

1594. That is done at present, is it not, in some hospitals? I am not aware.

1595. What is the course, for instance, at University College Hospital when a death occurs under anæsthetics?—The matter is reported to me as the senior anæsthetist, and I enquire into it and report it to the medical committee, and state whether I consider that the death was due to careless administration or whatever the cause might be.

1596. Whether it is due to preventable or unpreventable causes?—Yes.

1597. And in any case what was the exact cause?—Yes; and whether any blame is to be attached to anybody.

1598. Is any record of that kept that is available for scientific purposes afterwards?—Yes; since I have been attached to the hospital I have had a record kept of all cases, whether ordinary or attended with and fatality.

1599. Dr. Hewitt suggested to us that it would be valuable in the interests of medical science that some authority should have a return of all anæsthetics administered in public institutions, stating what were the anæsthetics and the cause of death in case

of any mishap, so that you would get a large body of statistics showing the relative mortality by different anæsthetics, and the particular causes of accident in individual cases. What is your opinion with regard to that?—It would involve an enormous amount of labour, would it not?

1600. Would it be scientifically worth it, in your opinion?—I am a little doubtful. It depends entirely on how the statistics are prepared.

1601. DR. WILLCOX.—Are not records kept at most hospitals of the anæsthetics given?—I do not know about most; there are some, I do not know how many.

1602. SIR MALCOLM MORRIS.—Surely they would be valuable data?—Yes, they would be useful data.

1603. Whatever the result of the statistics may be, that is another matter, but surely they would be useful data for the purpose of separating the causes?—I am quite in accord with Dr. Hewitt in saying that all hospitals ought to have the cases carefully recorded, and I am also in accord in saying that those data should be accessible, if need be, upon request to the hospital authorities. I only differ in so far as that I doubt whether it would be possible to have all those data from the different hospitals sent to some central body, because I think it would simply mean that we should have statistical figures and nothing else, which would be of no value unless you had the actual notes of the cases.

1604. CHAIRMAN.—You would have the actual notes in cases of accident, but you would find, for instance, so many thousand cases of chloroform and no deaths from chloroform?—Yes, but even there it is open, of course, to criticism because it depends so much upon who gives it.

1605. You mean that there are personal factors which no statistics can show?—I think so.

1606. Which vitiate mere figures?—Yes.

1607. As regards proceedings before coroners in the case of deaths under anæsthetics, you think that the questions asked a medical witness are sometimes unfair?—I think that one particular question is unfair. I have armed myself with one of the forms.

1608. What form do you refer to?—I will hand it in *(handing in the same)*. It is question 20 I object to. That form is employed, I believe, by some coroners, I do not know how many.

1609. It is not an authorised form?—No, but it is commonly used.

1610. Where a death occurs under an anæsthetic some coroners issue a list of questions to be filled up by the anæsthetist or the surgeon who performs the operation?—By the anæsthetist.

1611. Do you know which coroners issue those questions

and under what authority they issue them ?—I do not know how many employ that form. The matter really came to my notice a good many years ago now, when I was discussing the value of statistics with Dr. Danford Thomas. He asked me then to draw up some scheme of questions, which I believe at the time I did, and whether this particular schedule arose out of what I wrote I do not know.

1612. At any rate, some coroners in the case of deaths from anæsthetics send a list of questions to be answered by the anæsthetist ?—I may mention that this Form appears in "Taylor's Medical Jurisprudence." It is quoted, and the editor, I think, draws attention to that particular question.

1613. Which particular question ?—No. 20.

1614. Will you kindly read the read the question to which you object ?—"In how many cases have you given anæsthetics previously ? If any fatal cases say how many."

1615. That means to say, that supposing a man has given anæsthetics in three cases, and in one case he has had the misfortune, which might happen to anybody, to lose the patient, the inference might be drawn that he had lost 30 per cent. of his patients ?—That might happen.

1616. You think that is a thoroughly objectionable question to ask ?—I do, because, as I have pointed out in my précis, supposing a man were convicted for manslaughter upon it, or supposing an action for civil damages was brought against him afterwards ?——

1617. For negligence ?—Yes, upon that evidence.

1618. Then counsel may make the observation : "You have lost 30 per cent. of your patients" ?—Yes.

1619. Sir Malcolm Morris.—What is the motive for the question ?—To make the questions uniform, I think.

1620. Chairman.—May I ask whether the object of the question is for the coroner to be able to determine whether to hold an inquest or not, or would that answer come before the jury ?—You are asked to hand this Form to the coroner at the time of the inquest.

1621. These are questions to be asked at the inquest ?—Yes. "Please hand to coroner at inquest." I fancy it is largely used in London.

1622. Mr. Bramsdon.—There is no obligation to fill this Form up of course ?—No, but many young hospital men do not know that.

1623. Chairman.—Besides, the question can be asked at the inquest ?—Yes.

1624. Is there any further point to which you desire to call our attention ?—I do not think so. I have spoken about the proposed Bill.

1625. You agree with the proposed Bill ?—Only with certain modifications.

1626. With this exception that you think that future as well as existing dentists might be allowed to administer nitrous oxide if they had had a training ?—I also think that the scope of the Bill ought to be enlarged so as to include the employment of other than general anæsthetics.

1627. Local anæsthetics ?—Local anæsthetics and injections.

1628. You get into very awkward questions then, do you not ?—I am afraid that you always do if you try to legislate.

1629. Would you prohibit a dentist from using cocaine for operations on gums ?—No, not a qualified dentist.

1630. You would not prevent a man doing this. He gets something in his eye ; he goes into a chemists shop and asks the chemist to put in a drop of cocaine by means of a camel's hair brush and get the thing out ?—I should not object to that, though that, of course, is unqualified practice.

1631. It is the patient who does it ?—I should object to his injecting it into the tissue round the eye.

1632. When you come to putting these points into the terms of a Bill you raise a lot of questions which you have no intention of dealing with ?—It occurs to me that the whole difficulty can be met by merely saying, " general anæsthetics, or those employed for the purpose of alleviating pain at the time of an operation."

1633. But I rather understood you to say that you wished to extend it to local anæsthetics ?—Yes.

1634. Used for the purpose of alleviating pain at the time operation ?—Yes. I think it is very important that stovain injection should be included.

1635. Surely nobody but a qualified medical man would think of using stovaine ?—It is quite possible.

1636. Stovaine has to be injected into the spinal canal or under the skin. May I ask you on this point, do you think that as knowledge progresses local anæsthetics, such as stovaine and eucaine, are likely to supersede general anæsthetics ?—I should think not entirely.

1637. Not entirely. I suppose you could never use a local anæsthetic for operations on the brain or even anywhere near the throat ?—No.

1638. Sir Malcolm Morris.—But general anæsthetics might be superseded by local anæsthetics for ophthalmic operations very considerably ?—Yes, very largely.

1639. Chairman.—At any rate you think it is necessary to to make some provision for local as well as general anæsthetics ? Yes.

1640. But if you cannot get everything, do not you think it would be a step in advance if unqualified persons could be prevented from using general respirable anæsthetics ?—Certainly.

1641. Mr. Bramsdon.—You have read this draft Bill, I take it ?—Yes.

1642. It only deals with cases where a state of unconsciousness is produced?—Yes.

1643. So that it would not apply to local anæsthetics?—No, that is my point.

1644. You want to go further than that?—Yes.

1645. Sir Horatio Shephard.—I do not quite understand about the position in which you leave the dentist. You want to allow the dentist to use anæsthetics, but yet you say he ought not to administer them himself. Is that the point?—No. It is in this way. I think he should administer them himself, certainly nitrous oxide, but I do not think that either a dentist or a medical man should be allowed to operate and give the anæsthetic unless there be an over-riding circumstance of urgency compelling him to do so.

1646. That applies to dentists?—And to medical men too.

1647. Must there be two dentists then?—Yes.

1648. One to give the anæsthetic and one to operate?—Most of these men in the country have partners, you know.

1649 Mr. Bramsdon.—You agree, I take it, that dentists on the whole do administer nitrous oxide with success?—Absolutely.

1650. And that there have been very few mishaps in the very considerable number of cases in which it is administered?—Yes.

1651. I want to quite clear up this question about the coroner's inquest. I gather that for the purpose of ascertaining whether there is crime—that is, whether a person has been guilty of any negligence or is to blame—you consider that the coroner's inquest is sufficient?—Yes, although even in this case an expert's help is needed.

1652. You want, as a step in addition to that, a scientific inquiry into the more scientific side of the question?—Yes, that is the main thing, to decide whether the death was, as regards the anæsthetic, *post* or *propter*.

1653. That is an extra inquiry to the coroner's inquiry?—That is a very difficult question to answer. You see what frequently happens, so far as one can judge from reading the papers, is that a case is put down as a death from an anæsthetic, which occurs under an anæsthetic, and I think that the distinction between the two is not usually brought out by an uninstructed coroner.

1654. That evidently shows that the inquiry is not so complete as it ought to have been?—Yes.

1655. If we could ensure fuller and more detailed inquiries, that would probably meet the case?—Yes.

1656. You do not suggest that in place of the coroner there should be some other authority holding an inquiry?—I am afraid that I am rather inclined to advocate that.

1657. You want to do away with part of the coroner's duty

in holding inquiries into a case of death and to put it into the hands of somebody else?—Yes in this particular connection.

1658. Is not that rather impracticable?—I do not know whether that comes within the purview of my opinion, if so, I should think some better constituted court of inquiry could be made practicable.

1659. With regard to keeping the records in hospitals, do not you think that doing so would to a certain extent act as a preventative—that more caution would be required?—I have already said that I think all cases ought to be recorded.

1660. And you think that by proper records being kept it would prevent the occurrence of mishaps?—I should hope that is true, if the mishaps were due to carelessness.

The witness withdrew.

Sitting adjourned.

NOTE.

At the conclusion of this day's sitting the chairman intimated to Dr. Buxton that the committee would be glad, if by way of supplementing his answers to the questions put to him, he would read the evideuce given by Dr. Hewitt, a copy of which the Secretary would send to him, and state how far he agreed with it. Dr. Buxton has accordingly read Dr. Hewitt's evidence, and has submitted the following memorandum:—

MEMORANDUM by Dr. DUDLEY BUXTON.

(The Numbers are those of the Questions and Answers in Dr. Hewitt's Evidence)

1181. As a matter of fact anyone can act as a physician or surgeon and perform any of their functions, but may not act as an apothecary—provided he does not misrepresent his status. This raises the point—would the proposed Bill protect the public, or will it not merely promote the interests of a section of society—the medical men? At present a death under an anæsthetic, whether the anæsthetic is given by a layman or a medical man, involves the charge of manslaughter, and in the case of the medical man it further may lead to one of malpraxis. This issue has been raised. In the first case the decision arrived at has been decided upon evidence as to whether or not the person undertaking the duty of giving the anæsthetic had used to the utmost of his power what knowledge he possessed. The really important issue, whether any layman can possess knowledge sufficient to give an anæsthetic safely has never been discussed in court. I acquiesce in the view that special training and knowledge are required, and that for the protection of the public the ordinary untrained layman should not give an anæsthetic. The medical man is presumed to know his business, giving

anæsthetics being regarded as a part of that business, and is held criminally responsible if a death arises through causes over which the medical man has had control. It is this contention which bulks largely in considering the adequacy of the present system of enquiry into such fatalities in coroners' courts. I am not convinced, however, that the *personnel* of these courts is such as to ensure a satisfactory verdict. I deal with this matter in my evidence.

1194. This statement, although true, needs very much more elaboration to express the truth accurately. I should demur to it in its present form.

1199 *et alia.* There are various points raised in the evidence brought before the Committee concerning the action of the anæsthetics which do not accord with the views of many observers. For example, there exists a marked difference as regards the effect of carbonic monoxide (CO) and nitrous oxide as regards the blood. The former associates itself firmly with the red colouring matter of the blood (hæmoglobin) and prevents the necessary conveyance of oxygen from the air to the blood, while nitrous oxide on the other hand associates itself so feebly with the blood corpuscles as to offer no impediment to oxygenation whenever air or oxygen is admitted to the lungs.

1219. This is true only when the smoker is suffering from nicotine poisoning and all smokers are not so afflicted.

1223. The mouth mask must be removed in order to clear the field of operation. When "gas" is given by a nasal mask this is kept in position throughout the whole operation.

1237 *et seq.* Admirable as is this exposition of a difficult subject, I think it is necessary that it should be clearly understood that it does not present the matter from the standpoint of all scientific observers, nor, I presume, is it meant to do so. It is important to speak of anæsthesia as connoting a state when consciousness to painful sensation is totally in abeyance. "Light" or "complete" anæsthesia may be regarded as "inadequate" and "adequate," the latter suggesting that anæsthetists do at times employ "incomplete" or "inadequate" anæsthesia. Such is not the case. It is best to avoid these phrases in order to prevent this obvious misconception.

When the profundity of the action of the drugs upon the tissues of the body, and especially of those of the central nervous system, is referred to, it is best, I think, to speak of "light" or "profound" "narcosis." The stages of anæsthesia thus become degrees of narcosis, and are usually regarded as divisible into five (*more* Snow) in England, three in France (Dastre).

It may perhaps assist the lay members of the Committee if I attempt to elucidate some of the evidence by giving a brief account of what modern science recognises as the procession of events in chloroform narcosis.

Chloroform vapour enters the lungs, is absorbed by the blood and conveyed through the large pulmonary vessels to the heart. This organ pumps the blood, now laden with chloroform, throughout the body. The first organ supplied is the heart itself, as the first branches given off from the main vessel, the aorta, are the coronaries which supply the heart muscle with its necessary blood. As the heart unlike other organs never rests, it is most important that it should be properly fed with blood.

As soon as the tissues of the body are bathed in chloroform-laden blood they become narcotised—for example, the nervous system is put to sleep, the higher centres, those concerned with consciousness first, but in series all become affected until those in the lower brain which control life, the centres presiding over respiration and circulation, at length are narcotised and life ends. In normal anæsthesia the tissues give off the chloroform and the venous blood conveys it back to the lungs from which it is exhaled. The intake at first exceeds the output, then they become equal, later the output is greater than the intake. Chloroform differs from other general anæsthetics in being a tissue poison. It not only narcotises, it can absolutely destroy nerve and other tissues rendering functionation at first to cease and then to be impossible of resumption. The whole question of safe chloroformisation is one of dosage. A certain percentage produces anæsthesia, a higher percentage deadens or paralyses the vital centres (respiration and circulation). Interference with respiration, the "asphyxial factor," produces two disabilities; it lowers the vitality of the tissues by depriving them of the recuperative oxygen, and so renders them more easily destroyed by chloroform or other narcotics, and by interfering with "output" tends to accumulation of chloroform in the circulation. It establishes a vicious circle. The heart muscle is starved of oxygen and drugged by chloroform and venous blood, and so its function is deranged, also the controlling centres. A sudden high percentage of chloroform conveyed to the heart can absolutely paralyse it, as also the higher nerve centres. Hence we return to the necessity of dosage and methods which ensure the accuracy of the percentage of chloroform which is presented to the organism. The art of the anæsthetist consists in his appreciation of these laws, the variation in type in patients, and his ability to adapt his dosage to the individual and to the necessities of the different steps of an operation. The moral of course is that teaching technical to the art is necessary. Nitrous oxide narcosis is a simpler affair, and although requiring skill and experience it does not jeopardize life to the same extent as does chloroform. I do not wish to imply that chloroform is necessarily dangerous. If rightly handled and accurate methods are pursued its dangers may be brought to a minimum, but science and not haphazard is required.

The whole question of reflex movements under anæsthetics is most important, and I am glad Dr. Hewitt has pointed out that in the case of chloroform, at all events, the unskilled or unlearned person may, and probably will, destroy life while endeavouring to control movements which to the inexperienced appear to be voluntary or sub-conscious, but are in fact the result of nervous interaction. The extinction of these is only accomplished when respiration and circulation are brought to a standstill and life is destroyed.

1285. This answer appears to me to be at variance with much of the experimental and clinical knowledge which we now possess. Of course free performance of respiration predicates absence of overdose. Of course if no overdose is given, no toxic symptoms will arise. As regards the action of chloroform on the heart we know, and Simpson believed, that a highly concentrated vapour of chloroform can be absorbed from the lungs, carried by the coronary arteries to the heart substance and cause sudden death by heart failure. A similar result follows vagus action when high percentages of chloroform vapour are inhaled.

1290. Even so it is the heart that kills. Failure of respiration can in most cases be corrected; when the heart stops the final issue is death.

1303. While everyone recognises the dangers of permitting an "asphyxial factor" in giving chloroform, is it generally recognised that a flood of light has been thrown within the last few years upon the subject by physiological experiment. We now appreciate the fact that chloroform influences nervous and muscular tissue, and directly as its concentration varies. Below a certain percentage chloroform, as such, is practically safe, above that percentage it is always dangerous and may be deadly. It is assumed that the necessary precautions are taken which ensure free breathing, *e.g.*, posture and so on.

1323. Here I should like to say that all our reliable knowledge of anæsthesia is derived from physiological experiments. That clinical observation may be useful I am prepared to admit, but it is always crippled by two limitations: (1) since by its methods the individual factors at work in producing a result cannot be studied individually, as can be done by the experimental method; and (2) the interpretation of clinical notes is a blend of the minds of the men who observe and the man who interprets, and the *idée fixe* often unconsciously dominates one or all. The theory that anæsthesia is produced by lessened oxidation of the tissues in the sense that Snow enunciated it is not a sufficient working hypothesis. Anæsthesia can co-exist with complete oxidation of tissues. The question is still *sub judice*.

1325. The question of nitrogen acting as an anæsthetic I will not discuss, but I wish to point out that nitrogen, like all indifferent gases, belongs to a wholly different category to nitrous

oxide as far as anæsthesia is concerned. This I showed experimentally some 20 years ago.

1347. It was a belief at one time that women in parturition and young children enjoyed immunity from danger as regards anæsthetics. This has been proved to be a fallacy, as both women and young children die readily if overdosed. Dr. Hewitt justly remarks that if small quantities are used and are properly diluted the danger is slight, but the whole point is that the untrained administrators do not appreciate what is a small quantity and what is due dilution, and, in the case of the woman, yield to her semi-unconscious iteration, "Give me more chloroform," and give it in such a way as to permit of unsafe concentration of the vapour.

1352. I think that we have no evidence to show that deaths due to anæsthetics are more numerous and are increasing in frequency. I admit the proof of the converse is equally difficult to sustain. The reason why such deaths appear to be more numerous are, (i.) many more operations under anæsthetics are done nowadays, and yearly grow more numerous. The rank and file of the profession are now better trained and skilled in surgery, and perform a very large number of operations. (ii.) Cases of extreme gravity, those which a few years ago would have been left as inoperable, are now dealt with in our hospitals as well as in private; many die, some are saved. In the past all or most of such persons would have died. Take appendix cases for example. (iii.) The Registrar-General now schedules these cases of deaths under anæsthetics, although probably loosely, under heads which reveal their nature. (iv.) Medical men in hospitals and in private report and publish most fatal cases. It is impossible to decide this point unless one can obtain an accurate return of all cases in which anæsthetics are administered. In 1891 I was asked to speak upon anæsthesia at a meeting of the British Medical Association, and I then advocated an investigation into the *normal* as well as the *abnormal* cases of anæsthesia. A committee of the Association was formed, and Dr. Hewitt subsequently became a member of it. The classification of cases given in Dr. Hewitt's answers, 1365 *et seq.*, is the one which this committee formulated, and it is probably the best. 25,920 cases were examined and reported upon and published by the British Medical Association in 1900. I was led to push forward such an inquiry by the fact that when I was asked to go to India—(I eventually declined to go, and Sir T. Lauder (then Dr.) Brunton went to Hyderabad)—and represent the "Lancet" at the Hyderabad Commission, I recognised that to bring home to the clinician the results of experimental work, it would be necessary to compare experimental results with the experience obtained in practice. I therefore, at the instance of the "Lancet," drew up

a clinical report, which was published in 1893. I mention these reports because they were of the nature of a general registration of statistics of anæsthetics given, but were necessarily very incomplete in the sense that those who supplied information did so voluntary, and the difficulty of dealing with even a few thousands of cases convinced me that a national record, however desirable, would present great difficulties in execution.

1379, 1386, *et passim.* As regards the question whether dentists who hold the L.D.S. should administer anæsthetics in dental practice. The arguments advanced to support the contention that dentists shall be precluded from employing anæsthetics are that (1) dentists are not educated, it is alleged, to fit them for such a responsibility; (2) that they are in this sense a danger to the public.

(1) I find upon referring to the calendar of the Royal College of Surgeons, England, that the obligatory subjects for the L.D.S. diploma outside purely dental matters include (*a*) lectures on anatomy; (*b*) lectures on physiology; (*c*) a separate course of practical physiology; (*d*) a course of lectures on surgery and demonstrations on operative surgery; (*e*) a course of lectures on medicine; (*f*) dissections of the human body during twelve months: (*g*) practical surgery and clinical lectures during twelve months. These courses are all taken at a recognised general hospital, and are the same as those attended by the ordinary medical students, although the medical student is compelled to take hospital practice for a somewhat longer time. The dental student is examined upon all of the above subjects. I have looked through the examination papers set in the Royal College of Surgeons, England, examination for the L.D.S. diploma which have been set for the last ten years, and find that some knowledge has been expected from dental students upon the subject of anæsthetics and the dangers arising during dental operations under these agents. Thus in May, 1904, it was asked, "Describe the operation of laryngotomy and give the indications for its performance;" in November, 1900, "Describe the operation of tracheotomy. What difficulties may be met during the operation?"; in May, 1907, "What are the dangers incident to the administration of anæsthetics for dental operations? How may they be met?" I find also that the pharmacology of cocaine has been asked; that the dental students are expected to recognise such conditions as "post-nasal adenoid growths"; tumours invading the buccal cavity; diseases of the heart, of the liver, and of other organs; syphilis and general diseases. It must appear then that Licentiates in Dental Surgery of the English College of Surgeons are expected to know the essentials of anæsthetics as far as the specialty of dentistry is concerned and inferentially are qualified to administer them. In their special hospitals they see nitrous

oxide given every day and have to operate on patients who are under its influence.*

It is a curious fact that medical students have been less questioned upon the subject of anæsthetics during their professional examination. It is only within the last few years that they have been compelled to attend classes giving instruction in the uses of anæsthetics. It is lamentable to have to record that even now many of the degrees and diploma-granting bodies do not compel candidates for qualifying degrees or diplomas to give evidence of any acquaintance with anæsthetics.

(2) The statement (1413, *et seqq.*) that six cases of death under nitrous oxide have occurred in 21 years where dentists administered "the gas" hardly supports the contention that it is a public danger for dentists to give nitrous oxide (1398). I am quite in accord with the suggestion that only specially-trained men should employ anæsthetics other than nitrous oxide, and I should go further and should object to even a medical man employing them unless he had been properly trained in this branch of his duties. I should insist upon a special certificate of proficiency such as is at present required for vaccination, and should safeguard the public by stringency in granting such a certificate. I think also the training of dentists as regards anæsthetics should be made universally more thorough and uniform. The present attitude of the teaching schools of medicine is that students are so harassed by the multiplication of subjects that, unless these authorities are compelled by external pressure, they will not make anæsthetics a living item in their scheduled curriculum.

1395, *et seqq.* I heartily agree. I think the anæsthetist should be of the same professional status as the physicians and surgeons. An important point has been raised with regard to the fatalities mentioned. It is that in 11 cases of the 13 cited, one and the same man administered the anæsthetic and operated. This is commonly done by medical men as well as by dentists, and is most dangerous. Frequently it cannot be avoided, but if the practice can be prevented, saving of life will be effected. I could cite cases which have been published when death resulted from this practice even where an experienced medical man was concerned, but the fact is well known.

There are two great perils to the public; the giving of chloroform by dangerous methods for dental operations, and that of employing powerful analgesics by injections into the tissues, and I think both of these might be and would be resorted to if dentists were not allowed to use nitrous oxide. Very many

* In June, 1909, the R. Coll. Surg. Eng. has made it compulsory upon all candidates for the L.D.S. Eng. that they shall receive practical instruction in the administratton of nitrous oxide.

country practitioners employ chloroform rather than "gas" as being more portable, and few possess the apparatus for giving "gas." Indeed, I fear many hospitals are not provided with such apparatus. I am informed by the firms who supply unqualified dentists that nitrous oxide is being employed less than formerly, while local analgesics are being used more largely every day. I consider this constitutes a real danger to the public at large, since few know the subtle peril of such injections.

1417. I think this statement ought to be corroborated by reference to specific cases, especially if it is implied that the danger is one particularly liable in the practice of dentists. I submit that what Dr. Hewitt has heard is not evidence, and should not be admitted to tell against the dentists. I have seen cases published of such accidents, although they are not necessarily fatal, when the anæsthetic has been carefully administered by one person—sometimes a medical man—and the operation done by a skilled and highly qualified dentist. I take it the Committee should have specific cases of such accidents given to it when a non-medically qualified dentist operates after anæsthetising the patient. The practice is of course highly reprehensible, but I have failed to find evidence other than hearsay that serious and fatal accidents have been common as a result of the practice.

I do not condone the practice—I reprobate it—and would make it illegal for anyone, whether dentist or doctor, except when grave emergency could be advanced as an excuse. Even then the *onus probandi* should rest with the anæsthetist.

1425. I have gone into this matter very carefully, and from what I can gather from leading dental practitioners in London and the provinces, and from the Secretary of the British Dental Association, the feeling is that the proposed Bill would, if passed, prove a great hardship to very many men, and would in no way raise the status of their calling. The unqualified men would not be affected, as they would either use local injections or send their patients to a hospital for extractions before fitting teeth. It would further react unjustly upon the men qualifying after the passing of the Bill, as such could not administer any anæsthetics, and those qualified before its passing could do so. This would *ipso facto* give the latter a spurious appearance of being better qualified, and react very prejudicially upon the former class.

1522. The Section of Anæsthetics of the Royal Society of Medicine expressed a unanimous dissent to unqualified persons giving anæsthetics. Some members were not convinced that the suggested legislation would prove effectual, and so were not in favour of promoting the Bill. Some were in favour of L.D.S men being allowed to administer nitrous oxide, but no other anæsthetics. Some members wished the exclusion of L.D.S. diplomates from this practice altogether. All were in favour of increased facilities for teaching their art to those who give

anæsthetics. The objections urged against the draft Bill were that those who wished to evade its provisions could readily do so by pleading emergency, and that it would be practically impossible to obtain convictions when this excuse was advanced. It was also shown that "information" of infringement being left to common informers would render the Bill inoperative, except in the very rare occasions when a fatality occurred, and that such an occasion is at present provided for by common law. Objection was also taken to the exclusion from the provisions of the suggested measure of the use of dangerous local analgesics. These it were pointed out were becoming very often used, and would certainly obtain a greater vogue if general anæsthetics were prohibited in the practice of dentists. The Royal Society of Medicine as a whole has not expressed either assent or dissent to the proposed Bill. It has made no pronouncement upon it.

1534. The only value of post-mortem examination in these cases is that it reveals whether causes other than the anæsthetic caused death, *e.g.*, a sponge or foreign body in the air passages, vomitus in the lungs, aneurism or enlarged thymus pressing on the trachea. The effects of anæsthetics are not shown by specific morbid changes a few hours subsequent to death.

Mr. LEONARD MATHESON, L.D.S. Eng., examined.

2617. CHAIRMAN.—I think you are an ex-President of the British Dental Association?—I am.

2618. And you are President of the Odontological Section of the Royal Society of Medicine?—Yes.

2619. You are yourself a practising dentist?—Yes, and perhaps I may add that I qualified in the year 1877, receiving at the hands of the Royal College of Surgeons of England their diploma in Dental Surgery: that is to say, I am a qualified dentist but not a qualified medical man. I was on the staff of the Victoria Dental Hospital, Manchester, for some six years, and for some sixteen years I was on the staff of the Royal Dental Hospital in London, and I lectured for some years at Owens' College on Dental Surgery. I just mention these facts to show that I have come in contact with a good many students and practitioners, and I feel able to represent their views on this matter, although I was not the person nominated for the purpose of giving this evidence, my friend Mr. Norman Bennett, the Hon. Secretary of the British Dental Association, having been first nominated. He is ill, and I am taking his place.

2620. Of what does the British Dental Association consist?—The British Dental Association was formed in the year 1881 to promote the administration of the Dentists Act, which was passed in 1878, and to do all that it could to further the interests of the profession and to promote professional feeling among dentists.

Out of 5,000 dentists at present on the register in Great Britain and Ireland its membership consists of 35 per cent., and I may say that of the 5,000 registered dentists, those who are actually qualified, are now about 58 per cent.

2621. I am sorry to say that I do not know the difference between qualified and registered?—In the year 1878 the Dentists Act was passed, the purpose of which was to distinguish those dentists who were properly trained and fit to practise dentistry from those who were not; but at that moment anyone practising dentistry in any shape or form was placed on the register; it was felt that it was only fair; but thereafter whoever was admitted to the register had to obtain the qualification of Licentiate in Dental Surgery from one of the examining bodies, the College of Surgeons of England, or Ireland, or Edinburgh, or Glasgow. Therefore, after the year 1878 everbody who entered the profession and was put on the register had to take this qualification, which meant that he had been trained for at least four or five years and had been trained in medicine and in surgery up to a point, and in all things appertaining to his practice.

2622. Sir Malcolm Morris.—As long as four or five years?—Yes; for three years he has to work at his mechanical work, and for two years he has to study at a hospital.

2623. Chairman.—For two years he is attached to a general hospital?—For two years he is attached to a general hospital, and at the same time to a special hospital.

2624. Doing both contemporaneously?—Doing both contemporaneously—working at a general hospital alongside of students who afterwards become general practitioners, and working the rest of his time at a dental hospital or in the dental department of a general hospital.

2625. And taking the courses that the ordinary medical student takes?—He goes through the general courses of Anatomy and Physiology, and he takes a course in Medicine and a course in Surgery and Lectures, and he is afterwards examined by members of the Royal College of Surgeons in Medicine and Surgery so far as they appertain to his own particular work.

2626. Does he do clinical work in hospital?—He is not called upon to go round the wards; it is at his option, and he very often does.

2627. He takes Anatomy and Physiology as a compulsory part of his training plus examination in Medicine and Surgery?—And he has also to attend a course of lectures on Medicine and a course of lectures on Surgery.

2628. Dr. Willcox.—Is dissecting compulsory?—Dissecting is compulsory.

2629 Chairman.—You want to submit to us some observations on the proposed Bill dealing with the administrations of anæsthetics?—If you please. I desire to say on the part of the

British Dental Association, and I believe in doing so I represent the enormously predominating feeling of the dental profession, that this Bill, which as it stands would exclude dentists from administering anæsthetics for dental purposes if it became law, would be unjust, and that it is not called for; principally or primarily on this ground: that the dental student as a dental student has all his training based on a foundation of general Medicine and Surgery, and further he has very particular opportunities of being trained in the administration of anæsthetics for dental purposes.

2630. May I ask you, in passing: Does the point that you make refer simply to existing dentists or to future dentists?—To both, if I may say so, but more particularly to future dentists; because every dentist whose name has been placed on the register since 1878 (with certain exceptions in the years succeeding 1878) has had, and still has to go through courses of medical and surgical training and examination, and when they are in the special hospitals the men are frequently put through a training in the administration of anæsthetics for dental purposes.

2631. Sir Malcolm Morris.—What kind of anæsthetics?—Almost entirely nitrous oxide gas, and it is that on which I would lay particular emphasis.

2632. Do you object to the Bill so far as it applies to chloroform or ether?—Personally I should not, though I am bound to say that a good many others would object to it.

2633. They would not be satisfied if it exempted nitrous oxide alone?—A great proportion of them would be satisfied if nitrous oxide were made the only anæsthetic permitted to them.

2634. Chairman.—You have administered anæsthetics yourself, I suppose, very largely?—I did as House Surgeon at the Royal Dental Hospital years ago, and when I went to Manchester, where I first practised, when trained anæsthetists were unheard of, I administered for my partner and he administered for me; when I was operating he administered for me, and when he was operating I administered for him. I administered also at the Victoria Dental Hospital, Manchester, which was then founded, and where at that time we had nobody to look to to give anæsthetics.

2635. And so far as nitrous oxide is concerned, have you ever seen any accidents?—I have never seen an accident. I have seen such things as stoppage of respiration, which has been dealt with, of course, at once.

2636. You have had to resort to artificial respiration?—Yes, I think I can remember two cases, one hospital case and one private case.

2637. Have you known any case in which you have had not only to resort to artificial respiration but also to tracheotomy?—I have never known such a case; I only know of one such case recorded.

2638. In your opinion is nitrous oxide a very much safer anæsthetic than either chloroform or ether?—In my opinion it is, and I think that is the prevailing opinion of men who have had much wider experience than I have in giving anæsthetics.

2639. In what class of cases of dental surgery would you use a longer enduring anæsthetic like chloroform or ether?—One would use ether either alone or in addition to nitrous oxide in those cases where from nervousness or from some other cause it becomes desirable to make one operation, where many teeth have to be extracted, instead of successive operations as you would have to do if you used nitrous oxide.

2640. How long as administered by you would nitrous oxide last?—Something under a minute, or thereabouts.

2641. So that you could not take out more than two teeth at one sitting?—From one to several. But recently what has been called prolonged anæsthesia under nitrous oxide has been practised; that is managed by means of anæsthesia kept up through the nose so that you can still operate on the mouth whilst the patient is receiving the gas, and in that way you can operate for 3, 4, 5, up to 6, 7, and 8 minutes; but it is not practised so much as one might expect, because it leaves the patient almost more uncomfortable and unhappy afterwards than the administration of ether or chloroform.

2642. Do you agree that both ether and chloroform are a good deal more dangerous than nitrous oxide?—I do; they fall into quite a different category from nitrous oxide.

2643. Would it not be a protection to dentists if in the case of the administration of ether or chloroform they had to have a qualified medical man present?—Personally, I think so, provided also that that qualified medical man was a man familiar with giving it, which every medical man is not.

2644. There are a great many more medical men in England than there are dentists, I take it?—I suppose so.

2645. So that in case of a serious operation which was likely to last for some time, it would always be possible to get a medical man to administer the nitrous oxide?—I suppose so; but a case like that would not be like that of a man with a raging toothache who comes to have his tooth out, and might have to wait half a day or a whole day in order to get a qualified practitioner to attend and give him gas.

2646. Before you administer the gas to a patient do you make any examination of the patient to see whether he is fit to have the gas administered to him?—No, nor does the trained anæsthetist.

2647. But before administering chloroform or ether, you would do so?—Certainly.

2648. Any man who was about to administer chloroform would make a thorough examination of the patient with regard to the state of his heart?—Yes, and respiration.

2649. To see that his respiration was clear ?—Yes.

2650. And to some extent as to what were his habits and mode of life ?—Yes.

2651. You yourself would be satisfied if this Bill, assuming it to pass, allowed the administration of nitrous oxide by dentists, but in the case of other anæsthetics required the presence of a qualified medical man ?—Yes, I should.

2652. I suppose now there are an increasing number of medical practitioners who have had a special training in anæsthetics ?—There are in large towns. In London there are a number of medical men who give themselves up entirely to that work and hold hospital appointments for it ; and in Manchester and Liverpool, and in other large towns, the same thing has come about.

2653. But it is now a compulsory part of the ordinary training of every student in most of the London hospitals ?—I was not aware of that. As a matter of fact they are given a very perfunctory training, a training which would not make me trust to their giving nitrous oxide at all. I should like to say in this connection that the one terror of a country dentist who has no ordinary access to a trained anæsthetist is, lest his patient should say to him when he going to have gas, " If you do not mind, I should very much prefer my own medical man to give the anæsthetic." I have been in that position as a dentist, and I have throughout the administration quaked for the patient's sake ; and that is the current feeling towards the medical men (it is no depreciation of them to do so) who have had little or no experience in giving particularly nitrous oxide, which, although it is a safe anæsthetic, is rather peculiar in its administration.

2654. It requires a certain amount of manual dexterity as well as knowledge of the anæsthetic ?—Yes, and it is quite different, as any medical man here will know, from the administration of chloroform or ether, which is more or less an open, loose method. With gas you have to entirely exclude the air, and I have seen an ordinary medical man hold the apparatus a little way off the face. That is a very strong point ; you may take it for what it is worth out of my lips ; but the ordinary medical man who has not held a hospital appointment as anæsthetist, with exceptions, of course—and there may be many exceptions—is a man whom the dentist, if he had his own way, would not trust to give nitrous oxide.

2655. Can you give us any figures as to the number of administrations of nitrous oxide by dentists ?—I have been guessing at that, if I may say so, and asking other practitioners. It is impossible to say, of course, but we may take it in this way, I think. There are 5,000 registered dentists, and if you reckon that each of those every day has one gas case—which probably will be below the mark—that is 5,000 cases a day. If you

multiply that by 365 days, you get something less than 2,000,000 cases in the year.

2656. Sir Malcolm Morris.—Sundays?—We will not count Sundays; let us say 300 days, But it is such an enormous number that you can afford an enormous margin—say 200 days if you like; that would give a million cases a year, and in the course of 20 years that gives 20 millions.

2657. Chairman.—What proportion of accidents have happened, so far as you know?—I do not know of any except those that have come before you, I believe, at the instance of Dr. Hewitt; and I should be prepared to multiply those by cases that have not been heard of, and say that, in proportion to the cases in which nitrous oxide was given, they were negligible.

2658. Sir Malcolm Morris.—Is the proportion of qualified medical men who become dentists increasing?—If you mean of those who hold a medical qualification, I am afraid I am not in a position to say. There is always a fairly large number, but whether it is increasing in proportion to those who only take the L.D.S., I am not prepared to say. Perhaps this scarcely bears on your inquiry, but I may say that necessarily the proportion of those holding the L.D.S. is steadily increasing as compared with those who hold no qualification at all.

2659. Have you any idea as to the proportion of non-qualified men who were put on the register, still remaining?—Yes, I can give you that almost exactly. The qualified dentists are now 58 per cent. of the total register.

2660. That number is gradually increasing every year?—Yes.

2661. Chairman.—It is 30 years since the Dentists Act came into operation?—Yes.

2662. Sir Malcolm Morris.—Is there any difference in the number of accidents from nitrous oxide during the earlier period when there was a larger percentage of non-qualified men, and the numbers at the present time?—I am not aware that that is so; it has not presented itself to my knowledge at all. And that, of course, would strengthen the position that, even in the hands of an unqualified man who is experienced in giving it, there is no danger.

2663. Is there any material difference as to the method of administering it now as compared with when it was first introduced?—Yes, when it was first introduced there was a great deal besides the actual anæsthesia caused by the nitrous oxide—pure asphyxia. It was given alone then. Now, one might say that it is almost universally given either with the admixture of a certain proportion of air, or, preferably, oxygen; so that that does away to a great extent with the danger.

2664. In your own practice do you use it with an admixture of oxygen?—I leave it entirely in hands of the anæsthetist.

Practising in London, and having trained specialists here, for the sake of having everything as perfect as I can for my patient's sake and for my own sake, I ask the anæsthetist to come in ; but if I were in the country, I should certainly administer it in preference to asking my next door neighbour, a medical man, to do it, unless I had taught him, as many dentists do teach their medical colleagues.

2665. I want to ask you this other point : Supposing you were in the country, in that sort of way, would you think it right to administer gas yourself and operate at the same time ?—I should deprecate it, and I should always have somebody else.

2666. Have you any reason to believe that that practice is being followed among dentists ?—I think it is.

2667. You say that you deprecate it ?—I deprecate it, but I do not think, as a matter of fact, there is a great deal of harm arising from it.

2668. In a small country village where it is very difficult to get in medical men who know anything at all about it, how would it be done ?—Then I should not hesitate, if I were the dentist, to give it myself and to operate myself, having anybody that I could trust, a nurse or an unregistered assistant there to hand me anything I wanted, being prepared myself to deal with any emergency that arose under those circumstances.

2669. It would not be right for it to be done by the dentist alone ?—I think not because you ought to have somebody in the room to fetch or carry or go if necessary for anything you want. I do not myself make so much as some would of the argument that the man operating cannot watch the anæsthesia of the patient. I myself, when I have gas cases (though I have not given cases for some 20 years), find that I have my eye quite as much on the patient's condition as a whole as on the piece of the work I am doing.

2670. Then your point is, that dentists should not be prevented from giving gas when they are properly qualified, and have had a training in it, but that they should not give other anæsthetics unless they are qualified medical men ?—I am not sure that I should go quite as far as that. What I should insist upon is that they should be allowed to give nitrous oxide. You may say that that comes to the same thing ; but I should not emphasise the other point, particularly as I am not appearing only for myself, but for those who I know would not insist upon it. For instance, at the Edinburgh Dental School the administration of anæsthetics is made a great deal of. There, before a man can qualify as a dentist, he has to bring a certificate to show that he has administered anæsthetics 50 times at least.

2671 Chairman.—But anæsthetics may mean either nitrous oxide gas or some other anæsthetic ?—That is why I instanced it. I believe that there they do, in suitable cases, make a student

who is going to be a dentist administer chloroform, and I believe they do that because they think he is thereby qualified to deal with it.

2672. Dr. Willcox.—May I ask whom you employ in your own practice for giving anæsthetics?—A trained anæsthetist, a man like Dr. Buxton or Dr. Hewitt, or Mr. Carter Baine. But when I make that reply some might naturally say, "Does not that go counter to your feeling that dentists should give gas"? I say "By no means." The expert who makes the administration of anæsthetics a specialty is a man we welcome: the general practitioner can never be expected to stand on the same level.

2673. Do you agree that a clinical examination of the patient is advisable before an anæsthetic is given?—No, I do not, from my experience, certainly with regard to nitrous oxide, and also from my knowledge of what the trained anæsthetist does. You may say that he can tell a great deal from the face and appearance of the patient, as doubtless he can; but unless the patient has requested it I have never known a trained anæsthetist in my room ask the patient to submit himself to examination.

2674. Before administering gas?—Yes.

2675. But before administering ether or chloroform?—Then I should say that a man who did his work properly would naturally make an examination.

2676. You are aware that certain cases of heart disease run a great deal of risk, even in taking gas—cases of aortic disease, an aneurism?—Yes, quite.

2677. In such cases it would be advisable for an examination to be made beforehand?—Yes, and supposing one were told by the patient or by the patient's medical man that the condition was such, I take it that a trained anæsthetist would make an examination; and if the dentist was informed of the condition, then I think he would only be doing right to call in a specialist, and I think that he would do so.

2678. So that, on the whole, it would be safer for an examination always to be made, in order to be absolutely certain?—Yes, as a counsel of perfection, which the anæsthetist himself never practises.

2679. In cases of death under an anæsthetic, where a dentist gives the anæsthetic, has it been your experience that there has been a difficulty with regard to the death certificate?—I have known personally of no such case.

2680. But a dentist is unable to give a certificate of death?—Yes.

2681. With regard to ethyl-chloride, do dentists give it much?—Yes, I believe they do, although I believe they are beginning to fight shy of it, because of the accidents that have occurred.

2682. Would you place ethyl-chloride in the same category as ether and chloroform?—I should.

2683. I think you said that compulsory clinical work is not necessary to a dentist?—Do you mean in hospitals with regard to giving anæsthetics?

2684. Yes, examination of the heart, and so on?—That is not so.

2685. Mr. BRAMSDON.—I take it that under your suggestion one dentist would administer nitrous oxide for another?—Yes.

2686. Would there be any difficulty in the matter of cost in cases such as we were speaking of, in calling in a medical man or calling in another dentist to assist in the administration of the anæsthetic?—I think that is a most important point, and if you had not asked me the question I should have proposed to raise it. It would certainly add to the cost; you could not expect a medical man to come in and administer an anæsthetic without doubling the fee; he must have a fee as much as the dentist has at least. That is one reason, I think it is a subsidiary reason, against the Bill. A rich person can get a trained anæsthetist, and think nothing of the extra fee; a very poor person can go to a hospital, but the large middle class to whom 2s. 6d. or 5s., and still more, half a guinea or a guinea means a great deal, will go on with toothache and suffer rather than pay a double fee. I think, seeing that the number of fatalies in comparison with the number of administrations is so ridiculously small, that to compel a patient to have a medical man called in to give gas would be a real hardship to the public.

2687. When gas is given in the case of a dental operation, do you charge extra for the gas?—If the dentist gives it?

2688. Yes?—I think always.

2689. Then even if another dentist were called in it would add to the expense?—Yes it would. On the other hand, it would scarcely be quite so much; they might arrange very likely for a lesser figure than a medical man would charge, because it must be remembered that a medical man would have to carry about his apparatus, which is rather heavy and cumbersome, and would have always to keep it supplied; whereas if two dentists who were neighbours gave gas for each other they would each have their apparatus in place, and it would be a simpler and less costly thing for them.

2690. What would happen in case of the poor in villages, say, where there are no hospitals handy?—Then you find the dentist charges a very low fee for the operation without gas, and even when that fee is doubled as it may be when gas is given it would still be extremely small.

2691. You think that dentists in these poorer districts adapt themselves to circumstances as regards charges?—Yes, I do.

2692. As regards the nitrous oxide gas itself, is that a cheap or expensive gas?—Taking the gas and apparatus together, I really cannot tell you what the percentage of cost would be; but I imagine—this is quite a rough guess—that for each administration the actual cost of material would amount perhaps to 1s. or 2s.; it might be 6d. for all I know.

2693. What I mean is, the apparatus having been found, what would be the out-of-pocket expense to the dentist of a single administration?—I am sorry to say that I cannot tell you.

2694. Would it come to 1s. or 2s.?—No, perhaps not, because one knows that country dentists in some places will give gas and do the operation for 2s. 6d.

2695. Sir Malcolm Morris.—And 2s.?—And 2s.; so that makes the cost of the gas nothing; but any medical man would know that one does not charge for the gas; one charges for the skill in giving it.

2696. Mr. Bramsdon.—Can you tell us how the poor get on now when gas is required; do they dispense with it altogether?—The poor would go if they could to the nearest town, and if they went there they would manage to get the money to do it. If the dentist was a decent sort of man, I suppose he would do as many medical men do—do it at his own loss. But there is another point too, and that is, that recently local anæsthetics have come very much into vogue.

2697. That is another point which I understand you are coming to presently. Do I correctly understand that those dentists who were in practice before the Act of 1878 administer nitrous oxide now?—They have done all along.

2698. Therefore, you would not except them from the administration of it if this Act were passed?—I do not think anybody would dream of doing so. If I might say so, the Legislature would not legislate retrospectively, I take it.

2699. Chairman.—I want to ask you this question, which arises out of a point which was raised incidentally. You think it objectionable that a dentist, if it is possible to avoid it, should give the anæsthetic and operate himself?—Yes.

2700. Is there any body corresponding to the General Medical Council which has any sort of control over dentists?—The General Medical Council is the only body, except that the colleges which give the diploma have a certain amount of control.

2701. Is there anybody that can make rules for dentists and say, except in cases of urgency, it should not be lawful for the dentist himself to operate and to administer the anæsthetic?—I should think the General Medical Council would have power to do that.

2702. There is no dental authority with that power?—No.

2703. I suppose you agree that from every point of view it

is objectionable that a dentist unaccompanied by anyone else should administer, say, chloroform to a woman?—Yes, unquestionably.

2704. Cases have appeared in the *Times*, you may remember, where false charges were made?—Yes.

2705. And, curiously enough, those false charges were made in perfectly good faith?—Yes. I have had to give evidence in Manchester myself in a case where a brother practitioner was charged with a charge like that, under nitrous oxide; he had been foolish enough to give gas alone. For his own sake the dentist should not give even gas alone.

2706. I did not know that cases had even arisen with nitrous oxide?—That is so.

2707. They have arisen more frequently under chloroform?—Yes.

2708. And there are special reasons, are there not, with chloroform?—Yes.

2709. I will just ask you one further question on this. Do you agree that when a fatality occurs under an anæsthetic (I am not speaking merely of dentists, but of anybody) there ought to be an inquest, or that the coroner should at any rate hold an inquiry?—I am not sure that I am prepared to answer that question further than to this extent, that in my mind it would depend altogether upon whose hands the case occured in.

2710. For scientific purposes, is a scientific inquiry desirable into the cause of death under anæsthetics, so as to avoid future accidents. Do you think we should get valuable information?—I should not have thought so.

2711. Supposing this legislation were to take place, what would you say about persons who are unregistered dentists administering anæsthetics?—I should say that they are entirely out of the question; they should not be allowed to do so.

2712. Will you give us your reasons for that view?—With pleasure. The fact of a man being on the register shows that he has been educated and trained and examined in those things that he sets out to perform for the benefit of the public. An unregistered man gives you absolutely no guarantee of that kind, and therefore he is entirely unfit to deal with any surgical matter whatever.

2713. He may be skilled or unskilled, but there is absolutely no test?—There is no guarantee.

2714. If a highly skilled foreign dentist, say an American, comes over here, are there any means by which he can get on to the register?—If it can be shown that the qualification which he possesses is equivalent to that given here and calls for an equivalent curriculum, then he is allowed to practise. If he cannot show that, then he has to submit himself to an examination and to a shortened curriculum.

2715. But he can get on to the register?—Yes, if that is shown.

2716. And it is his own fault if he does not if he is a highly qualified man?—Yes.

2717. Mr. Bramsdon.—I should like to ask you upon that, what is the position of companies of unregistered dentists?—At the present time I may say that in Ireland it has been shown that a company which is run by unregistered men is illegal. Here in England we have had much more difficulty. But it is considered a very great wrong and a very improper thing that, though you can get at an unregistered man for assuming title, you find much more difficulty in getting at unregistered men when they are members of a company.

2718. But whatever the position of a dentist *quâ* dentist may be, yet *quâ* anæsthetist who administers nitrous oxide gas, I take it that you would be clear that only those who are registered ought to administer nitrous oxide?—Yes.

2719. Whatever their other qualifications may be with regard to extractions?—Yes.

2720. Chairman.—Would you have any objection to this, supposing a dental company is registered, as long as it acts through employees who are registered dentists?—So long as its work is entirely done by them there would be no objection, except the feeling, which may or may not appeal to people outside the profession, that it is unprofessional to run things by companies like that.

2721. You do not like the idea of professional men being owned by a company?—No, I very much object to it. There are very serious objections to it, I think.

2722. Mr. Bramsdon.—I think dentists throughout the country are very keen about this; they are very hostile to companies containing unqualified men who practice dentistry?—Undoubtedly; for the reason that whilst you can prosecute an unregistered man if he assumes any title, which is the gist of the Act of 1878, you find it very much more difficult to get at an unregistered man if he is in the employ of a company.

2723. Sir Malcolm Morris.—What is the gist of the Act of 1878?—To prevent anybody who is not registered from calling himself dentist, or dental surgeon, or assuming any title which would lead the public to suppose that he was specially qualified to practise dentistry. It is on those words "specially qualified" that all the cases have been fought; and there has been a recent case, which may be known to the Committee, in which a man has been indicted for simply having the words "teeth" or "painless extractions" set out on his premises; the simple use of such words has been held by a judge to be transgressing the Act of 1878.

2724. Dr. Willcox.—Is compulsory training in the adminis-

tration of anæsthetics the rule with regard to the dental curriculum?—No, it is not at present.

2725. Do you consider it desirable that it should be compulsory?—Yes, I do.

2726. Mr. BRAMSDON.—Supposing a dentist were left alone and tracheotomy were required would he be able to perform the operation?—He should be able if he is a qualified dentist, if the case demanded it.

2727. It is included in his training?—It is included in his training; he is asked questions about it, and he is shown how to do it; it is not compulsory, but he is shown.

2728. CHAIRMAN.—He is very unlikely to have performed tracheotomy?—As unlikely as a general practitioner who is called in.

2629. DR. WILLCOX.—I do not think so?—As unlikely as a general practitioner who has not been a house surgeon.

2730. They have to do operative surgery?—Then perhaps to that extent they would be more likely.

2731. Is operative surgery a part of the curriculum of dentistry?—No.

2732. CHAIRMAN.—Now I want to come to another point which is raised by your evidence. You suggest that it would be well that this proposed Anæsthetics Bill should apply to local anæsthetics. There we get into a difficulty, but I should like to know your idea?—I do not know how such a provision would be framed, but the point of the British Dental Association is that if you prevent a qualified dentist from administering nitrous oxide, then you compel the dentist practically to use a local anæsthetic, which has been shown to be a very dangerous thing.

2733. There I quite agree. I see that difficulty, but I want to know whether you are prepared to go further, and to say that there ought to be a legislative prohibition of the use of local anæsthetics?—Yes, I think it is desirable. I think it is more desirable than that a qualified dentist should be prohibited from giving nitrous oxide gas, because I think there is more danger in that direction.

2734. But it is rather difficult to define local anæsthetics, is is not?—There are substances of varying power and strength which act as local anæsthetics?

2735. Let us take this case. Supposing that unqualified people are forbidden to use local anæsthetics, carbolic acid is a strong local anæsthetic, is it not?—Yes, you may call it so.

2736. Supposing a man had bad toothache, a decayed tooth, you would not make it a penal offence, would you, for anyone to touch that tooth with a tiny drop of strong carbolic acid?—I would not; but by the use of local anæsthetics I meant practically the injection of a potent drug for the inducement of local anæsthesia.

2737. You would confine it to a hypodermic injection?—Yes.

2738. Sir Horatio Shephard. — You do not include cocaine?—Yes, I mean cocaine.

2739. Sir Malcolm Morris.—As a matter of fact, you do not mean a hypodermic injection?—I mean a hypodermic injection as applied to the gums.

2740. That is not derma?—What would you call it? Injection of a drug, thereby introducing it into the circulation.

2741. Chairman.—I was thinking of the difficulties of legislation. Can you draw any distinction between dropping a drop of strong carbolic acid into a decayed tooth or on a gum, and using a local anæsthetic for the purpose of an operation?—I should have thought so by the result; that in injecting a drug like cocaine, for instance, you at once introduce it to the general system; whereas although if you apply carbolic acid over a large enough surface you can undoubtedly do serious harm, yet used in such a way as you have suggested it is not like introducing a drug into the system.

2742. Take another case, then. Supposing a man with bad toothache goes to a chemist and gets a small bottle of camphorated chloroform; that is the administration of a local anæsthetic which to some extent is taken into the system?—Yes.

2743. Do not you get into difficulties in that way?—So far as I can see, if you confine it to injection that would meet the difficulty.

2744. Injection meaning actual perforation of the skin and injection of the drug?—Yes.

2745. That would practically confine it to cocaine?—And such like congeners.

2746. But, on the other hand, you would not, for instance, interfere with a man who does this: he gets a small cinder into his eye and goes into a chemist's shop and asks the chemist to drop a drop of cocaine into it, that would not be injection within your meaning?—No. May I point out, with reference to injecting, that there is not only injecting the drug but a certain danger of septic infection. You cannot harmlessly introduce a needle under the skin or under the gum unless it is surgically clean; you may be introducing all sorts of things besides your cocaine. Presumably, if a qualified man is worth anything, he is worth more than an unqualified man, inasmuch as he knows that and will take pains to avoid it.

2747. You would be satisfied and you think it is desirable that the use of local anæsthetics analogous to cocaine should be prohibited for operative purposes?—Yes, something of that kind would, I should think, serve the purpose.

2748. Have you known of any deaths through the administration of cocaine. There was one reported the other

day in the case of an unqualified foreign dentist?—Yes, and there have been others.

2749. Was that by paralysis of the respiratory organs?—Its effect on the action of the heart rather than on the respiratory organs.

2750. Those cases are few and far between?—I should say they were more than the cases which would be alarming under nitrous oxide, certainly in proportion to the number of cases in which the two drugs are respectively used.

2751. Do you think that qualified dentists should be allowed to use cocaine injections?—Yes.

2752. Without the presence of a medical man?—Yes.

2753. You would confine it to them and to doctors?—Yes, I should.

2754. Dr. Willcox.—You regard cocaine and the allied drugs as powerful poisons?—I do.

2755. In your experience are the symptoms from the administration of cocaine common without death actually resulting?—Might I ask you what you mean by "common"?

2756. Fainting, tremour, collapse?— In my experience they have been common enough to make me give up cocaine. When it was first introduced I used it; and I had one or two cases which were no worse than the patient having to lie on the sofa for an hour or so and having stimulants administered, but which were so alarming to me, personally—and other persons expressed themselves as so alarmed—that I felt I had better go back to nitrous oxide.

2757 They alarmed you?—Yes.

2758 Is stovaine used?—Not in dentistry, I think.

2759. Do dentists in the course of their training have instruction in therapeutics and the dosage of drugs such as cocaine?—Yes.

2760. Sir Horatio Shephard.—Would it not be exceedingly inconvenient to prevent one private person from administering a thing like morphia to another?—I should think, on the whole, it would be a very good thing indeed.

2761. I happen to have known an instance in which a man had to have morphia constantly injected?—You would, I take it, in any Bill that was brought before the Legislature, have some guarding clause such as "under the supervision of a medical man," or "in emergencies," or something of that kind.

2762. Chairman.—I suppose you would call morphia more of a general anæsthetic than a local anæsthetic?—Yes.

2763. It is a narcotic going into an anæsthetic?—Yes, it would scarcely be used in dentistry.

2764. I was not thinking of operative purposes?—If the Bill were so drawn that it should be improper to use it for operative purposes, except by a qualified man, then it would not touch such cases as you suggest.

2765. I will ask you a general question. May I take it that, in your opinion, with all your experience, you think on the whole local anæsthetics are more dangerous than nitrous oxide for dental operations?—Yes, I do; the result is that I rarely use them. There are some few cases in which people have such an ungovernable objection to any form of general anæsthesia that one feels called upon to use a local anæsthetic; but I do not use it once a year—if I do, I inject it myself. There are dentists of good position who do use it a good deal.

2766. If the danger of local anæsthetics could be overcome, local anæsthetics would be infinitely preferable to general anæsthetics?—It would be a perfect anæsthetic.

2767. Dr. Willcox.—Have you seen these new forms of apparatus for giving local anæsthetics where water is given under high pressure?—I only know of them.

2768. They have not come into general use?—No.

2769. Chairman.—Would you call freezing a local anæsthetic?—Not in the same way. There again I draw a distinction between that and injecting. I think local anæsthetics are often extremely objectionable, because they lead to trouble like necrosis afterwards, and I myself have avoided them for that reason, and many others do because there have been numerous cases of local trouble of that kind.

2770. Mr Bramsdon.—For all dental purposes would nitrous oxide be sufficient?—Yes, if you were tied down to it; that is to say, in a case where one would ask the anæsthetist to give ether or chloroform, as the case may be, you could, by a succession of administrations of gas, do what you wanted. You would have sometimes to use a more prolonged method in a case, for instance, of the extraction of an impacted wisdom tooth, which might take you as long as a quarter of an hour. Then gas would not do. In such cases as that one is very glad to get a general anæsthetic.

2771. Then dentists in such cases, if they wanted other than nitrous oxide, would have to get a medical practitioner to administer it?—Yes.

2772. Chairman.—Have you anything further to add?—I do not think I have.

The witness withdrew.

NINTH DAY.

Tuesday, 16th March, 1909.

PRESENT:

SIR MACKENZIE CHALMERS, K.C.B., C.S.I., *(Chairman).*
MR. ARTHUR THOMAS BRAMSDON, M.P.
MR. WILLIAM H. WILLCOX, M.D.
MR. J. F. MOYLAN *(Secretary).*

MR. FREDERICK BUTTERFIELD examined.

2897. CHAIRMAN.—You are, I believe, the secretary of the Incorporated Society of Extractors and Adaptors of Teeth, Limited, of Clarence Buildings, Piccadilly, Manchester?—Yes.

2898. Your Society, I think, was formed in 1894?—Yes.

2899. And it was incorporated in 1896?—Yes.

2900. It was incorporated, I take it, under the Companies' Acts, 1862?—Under the Board of Trade, not for the purpose of making a profit.

2901. Still under the Companies' Acts?—We applied under the 1862 Act, that is, to dispense with the word "limited," as a charitable institution; but, unfortunately, they did not see their way to grant us that permission.

2902. Therefore it is incorporated as an ordinary company?—It is incorporated as an ordinary company, but we make no returns beyond this: if there should be a change in the election of the council. And it is not a trading society, and makes no return for income tax purposes.

2903. It has no income except subscriptions?—Its income is by subscriptions. The entrance fee for each member is two guineas, and the annual subscription one guinea.

2904. And you have about 1,000 members?—Yes, we have nearly 1,000 members. The Society has 12 branches; each branch has a president, treasurer, secretary, and council, and has power to send its secretary as an *ex-officio* member of the head council; and when the membership of a branch reaches 50 it has a further representative on the head council, and when it is over 100 strong it is allowed two representatives.

2905. But as a matter of form all members are shareholders or members of this body?—There are really no shares, but each member's liability is limited to £5. The investments of the Society are all in gilt-edged securities. The articles provide that in the event of our Society becoming extinct, the fund of the Society shall be handed over to some body having similar objects.

2906. You mean under application to the Charity Commission?—Possibly so.

2907. But you see no prospect of your extinction at present, I take it?—I hope not, thank you. All officers in this Society of ours are honorary.

2908. Unpaid?—They are all unpaid except myself. I receive an annual salary of 10 guineas per annum, which I hand over to the clerks; but that is only so as to be amenable to the law.

2909. Will you kindly tell us what are the qualifications for membership of your Society?—The qualifications may be enumerated in this manner: an applicant must be over 21 years of age, and he must have served an apprenticeship of not less a period than three years to either a member of this Society or to a person whose name is upon the Dental Register.

2910. Three years' apprenticeship or pupilage?—As a minimum.

2911. And it must be with either a member of your Society or a registered dentist?—Yes. Byelaws have been passed since the memorandum was filed compelling a man before he can be admitted into the Society to have been in *bonâ fide* practice for himself for a period of not less than one year. When an applicant makes an application, he immediately forwards that to the head office, and the secretary then transmits that application to the local branch where the applicant may be residing, and the local secretary then brings it before his Council, who appoint either one or more representatives to visit the applicant, and his operating room is inspected, likewise his surgery, and several questions are asked him, and any other information that the representatives of the Society may desire he is bound to supply. After that is concluded, the representatives report to their branch, who then forward the communication to the Head Council, and the question is then discussed; and, finally, if he is admitted a member, he signs a declaration that he will observe all the byelaws, rules, and regulations.

2912. Have you a form of application with you?—I have. He is also requested to obtain the signatures of three individuals, usually professional men (*handing in a form*).

2913. There is one point that I do not quite understand on the form. The applicant has to state his name in full, and his residence?—Yes.

2914. Then he has to state the addresses of all the establishments where his practices are carried on?—Yes.

2915. Then the form says: "If insufficient room for all, kindly send separate list attached to this form"?—Yes.

2916. I do not quite understand how one person can carry on practice at such numerous addresses?—He can easily carry it on by having one head establishment, and on one or two days per week visit the various country villages, say, for two or three hours per day. That is the point.

2917. It only refers to his own practice?—Yes.

2918. Not to assistants?—Not to assistants.

2919. It is his circuit, so to speak?—Yes, and it is intended

further as a guide for council's consideration. If they find out that he is carrying on another practice, they not only visit the head place but due inquiry is made in the respective branches as to the reputation of this individual. Something must be done as a guide for the benefit of the Council, because the Council discovered a few years back that one of our members had been carrying on another practice under another name in another district, by the aid, I suppose, of a manager or an assistant. When this came to the Society's knowledge all the old application forms were destroyed and new ones printed, so as to obviate any similar case occurring.

2920. Have you any rules or regulations about the employment of assistants?—In what respect?

2021. Could a member of your Society have two rooms going at once, in one of which he would be operating and in another in which an assistant of his could be operating?—If the assistant, in the estimation of our member, was a capable man; but the Society does not take the responsibility of that. If it came to the Society's knowledge that a man was employing an assistant who was not a competent assistant, he would be dealt with under section 13, clause 2. It would be a question of expulsion. But as you know, there are good and bad assistants, and many assistants are extremely clever men.

2922. Certainly?—I have a letter in my possession here, which is dated October 12th, 1908; it was a letter that came to me whilst I was in London on that day. Would you mind reading it (*handing in a letter*).

2923. This is from a man who wishes to become a member?—Yes, that gives you an idea of the class of man we have making application for membership. He was employed as assistant by one of the greatest men, I believe, on the Dental Register to-day, and you see it is as operating assistant; he distinctly specifies that.

2924. He is an assistant helping a qualified dentist?—He is not supposed to do so, under the General Medical Council's code of ethics.

2925. Except that a man may always employ an assistant for doing manual work on teeth?—That was a case where this man was employed on even attending children's teeth, in London districts, and other places.

2926. I mean, making false teeth?—But this was operating. So you see that even qualified men, no matter what their degree may be, employ unqualified assistants. And then, again, so far as assistants are concerned, to give you an idea, there is an old saying that a thousand diplomas do not make a man a dentist; but we must admit that the majority of all dentistry is more or less of a mechanical nature. There must be mechanical ingenuity and skill in nearly every department of dentistry, more so than theoretical knowledge.

2927. Manual skill at any rate?—Yes. We have been taking an analysis of the Dental Register; it is not yet completed, although we have got over 700 returns. This form I have here was sent on to me whilst in London. You will notice in the Register this man William Priestnall, 25 Waterloo Road, Widness; he was registered in 1878, on December 20th, and he holds the Licentiate of Dental Surgery of the Royal College of Surgeons, Ireland, 1882; and I have a letter here which says that he has ever since in Widness followed the occupation, and does to-day, of a barber; but his diploma hangs in his parlour, where I have seen it myself.

2928. Is he registered or qualified under the Act?—He is registered under the Act of 1878, and has obtained the diploma of the Royal College of Surgeons, Ireland, 1882. His name appears on the Dental Register for 1908, so he is an L.D.S., *sine curriculo*. In this register it is very difficult to find who are *sine curriculo* men or not. As I understand you are holding an inquiry as to the number of deaths which occur in the hands of dentists, it is well to take into consideration, in the past records of fatalities in connection with anæsthesia, that the majority of deaths in connection with dental matters have been in the hands of those persons whose names appear on the Dental Register. He has his name on the Dental Register for verification.

2929. I see that he is one of those who was in practice before July, 1878?—Yes.

2930. And then he was licensed by the Royal College of Surgeons, Ireland, in 1882?—But the examination there is evidently not a thorough or practical examination.

2931. Dr. Willcox.—He would be allowed to go in for examination without the proper course?—I should take it that a man of this description of education could not pass any course, not even a preliminary examination. There are many on the Register who are similarly situated.

2932. Chairman.—But of course as time progresses they are dying out fast?—There are 2,008 on the Register to-day of these men, and there are 130 who are residing abroad, and then there are 33 who have died and have been dead for, in some cases, two or three years, consequently their names should not have appeared on the Dental Register. There are others who are retired, and there is a very large percentage of men who at the passing of this Act were following the occupation of blacksmiths, barbers, shipowners, brewers, and so on. I have with me to-day an analysis up to the present of 437. This is only the analysis so far as we have reached, but I am prepared to supply this Committee with a complete analysis of the whole of the Register within one month. It gives you an idea of what was the composition of the Dental Register in 1878, and is to-day.

2933. We are concerned with 1909?—Yes, but we have a

large number of these men, and these are the men whose description I have got, and their occupations, who were admitted in 1878.

2934. And are still on the Register?—And are still on the Register; and what is more, the occupation they are following to-day.

2935. Will you give us two or three specimens?—Two are herbalists, that is out of a total of 437; there are 89 chemists, 55 retired, 33 dead, 31 cannot be traced, having left their addresses as shown by the Register; one is an optician, one a chiropodist, two are herbalists, two dispensers, one in the wholesale smallware trade, one a carpenter, one is a weaver, two are ironmongers, one is a brewer, one a shipowner, and there are a barber, a sculptor, a travelling showman, etc.

2936. I do not think we need trouble more about that. Those people may still keep their names on the Register of dentists, but they may have abandoned the occupation of dentists?—Their names are registered, and this is the way in which our analysis is taken (*handing in a document*).

2937. Here I see is a man whose name is on the Register, but he is not practising dentistry, though he has not taken his name off the Register?—You see the inquiries which have been made, and this is the manner that the analysis of the Register is made.

2938. It does not really affect our inquiry?—It is very interesting information if it is only to realise what is the composition of many men's capabilities who are on the Register. The point, I understand, is that it is a question of public safety and of public benefit, hence my analysis.

2939. Now we will get quite away from the question of dentistry, and come to the question of anæsthetics. Do the members of your Society administer anæsthetics to their patients? — They administer nitrous oxide gas and local analgesics.

2940. To clear the ground, do they administer chloroform and ether, or the more permanent anæsthetics?—Chloroform is absolutely forbidden by the Council of the Society.

2941. On account of its danger?—On account of its danger; and any other alcoholic mixture.

2945. The A.C.E. mixture?—Yes, the A.C.E. mixture is forbidden, and ether as well; because we look upon those as requiring the necessary training of a qualified medical practitioner, and they might be extremely dangerous in the hands of a person who had not been specially trained.

2943. Let me see if I understand you. You think before chloroform or ether or one of those analogous anæsthetics is administered to a person, he requires careful examination?—I do.

2944. As to the condition of his heart, his habits of life, and as to respiration?—Yes.

2945. And the members of your Society are forbidden, as I understand, by the bye-laws of your Society, to administer what I may call the general respirable anæsthetics other than nitrous oxide gas?—They are forbidden to use anything but nitrous oxide or nitrous oxide and oxygen.

2946. That is a necessary part of the administration, of course?—Yes. I may say that there have been ethyl chloride administrations in the past by some members, but owing to its unsatisfactory return, the Society have discouraged its use.

2947. Was it administered as a general anæsthetic?—It was in the past few years, but owing to its record not being so clean, the Society have discouraged its use.

2948. DR. WILLCOX.—Have they forbidden its use?—They have not absolutely forbidden it, but they discourage it, and where the administrations formerly ran into some thousands per annum, it is not so to-day. I believe there are a few using now what is called "narcotile" and "kelene."

2949. CHAIRMAN.—Is that a local or a general anæsthetic?—It is a general anæsthetic on the lines of ethyl chloride, but with a guarantee from the makers that it is absolutely pure, and these are trade mark names which are used.

2950. It is only another name for ethyl chloride?—It is; only it is pure ethyl chloride.

2951. But in your judgment is not that somewhat dangerous?—In the opinion of my Council it is very unwise to administer it.

2952. Supposing a member of your Society uses one of these anæsthetics and it comes to the notice of your Council, what is your procedure?—Our procedure is to write him a letter and call his attention to the fact and ask him for an explanation. When that explanation is sent, it is passed to a special board to deal with the subject, what we call the "Parliamentary Committee," composed of three officers. The Parliamentary Committee then go into the subject fully, and the member is notified that he must appear before the Council on a certain date at a certain time, to show cause why he has refussed to carry out the Council's order; and the Council have power to expel him or suspend him from membership. I have the rule to that effect here.

2953. Supposing he is expelled, he can still go on practising just the same?—He can still go on practising.

2954. His legal status is not altered in any way?—No; but membership of this Society has come to be very highly valued and esteemed amongst unregistered practitioners; partly because of so many having in past made application and been rejected. We have endeavoured to keep our register as clean as it is possible, and we have controlled members of our Society who, had it not have been for the Society, would have been able to run loose.

2955. Before you go into the figures, I want to put one or two difficulties to you that occur to me. If unqualified persons were prohibited from administering anæsthetics, how do you suggest that, as a matter of law, you could distinguish between a member of your Society and any member of the public?—You want me to give you an idea of how the public should distinguish.

2956. No, how as a matter of law. You do not wish that any prohibition of administering anæsthetics should apply to members of your Society?—We do not.

2957. How do you suggest, as a matter of law that could be made clear on the face of an Act of Parliament; how is the law to distinguish between a member of your society and any other person who chooses to call himself an extractor of teeth?—The only thing I could say is that clause 2 of the proposed Anæsthetics Bill, which reads as follows: "This Act shall not apply to any person who having been registered under the Dentists Act, 1878, before the passing of the present Act, shall administer any drug or substance with the object of producing a state of unconsciousness during any dental operation, act, or procedure," should read, "This Act shall not apply to any person who shall administer nitrous oxide gas with the object of producing a state of unconsciousness during any dental operation, act, or procedure."

2958. Any person?—Yes.

2959. To take an extreme case, one of the unemployed who wants something to do, and calls himself a teeth extractor?—Yes, and I do not suppose it would be the first time some of them have tried, because there are many men who have offered to teach any one for £10., within, I suppose, a week, to carry on a successful practice. But one of the unemployed could not act in that capacity because he would not have the necessary capital.

2960. Unless someone supplied it?—I will give you an idea of the cost. The cost of a gas-stand would be £3, the cylinders would be £2, that would be £5, the bag, tubing, and two face pieces, with waste stop-cock, would be another £2 10s.; that would make the cost £7 10s. Then gags and forceps another £2 10s.

2961. A man cannot start without a capital of £10?—He cannot start without a capital of £10 to administer nitrous oxide gas. Then each 100-gallon cylinder of gas would cost him 5s., while each administration to his patient of the necessary gas for the anæsthetic would be 5d.

2962. Now, coming to the question of nitrous oxide gas, which is rather a different question from the other, you have got some figures, I think, as to the number of administrations by members of your Society?—Yes (*handing in statistics as to the administration of anæsthetics by members of the Society of Extractors and Adaptors of Teeth*).

2963. Can you give us just the totals?—Which country would you take first?

2964. England, as we are in England?—Do you want me to go through the counties or the gross?

2965. The gross for England, Ireland, Scotland, and Wales?—Taking England for a commencement, the members of the Society have places of business to the extent of 1,291, that is including branches, of which we spoke before. The total number of adminstrations of local analgesics was 919,399 for 1908.

2966. Not nitrous oxide gas?—No, local analgesics, submucous injections with the aid of novocaine, eucaine, and cocaine. The cases in the various counties I have tabulated for you.

2967. Will you give us your total figures of the administration of nitrous oxide?—Nitrous oxide for England, 142,872 administrations for the year 1908.

2968. How do you get those figures. Are your members bound to make a return to you?—The council decided to take statistics of the anæsthetics last year, and an order was issued to the members that they should keep a record of their anæsthetic cases, and on the 1st January forms were sent out, of which I have several specimens here (*handing in the same*). These returns were taken from the books of each individual member. The members are bound to supply them according to the declaration. Since members first joined the Society (some members have joined a shorter period and others from the commencement) there have been 6,106,329 administrations of local analgesics; the gas administrations were 1,249,167, and there was one fatality in England, which happened under a practitioner in Nottingham on the 4th March, 1907, under ethyl chloride, and at the coroner's inquest which was held (of which I have a report from a newspaper) it was then fully proved that the man had administered it in no less than 2,500 cases before—also to the same person—without having had any fatality, and the coroner said that no blame could possibly be attached to the operator.

2969. That 1,249,167 includes ethyl chloride as well as nitrous oxide?—Yes.

2970. There has been no accident, as I understand, with nitrous oxide?—There has never been a single accident with gas amongst the members of our Society, nor yet with local analgesics.

2971. Are those the figures for England?—Those are the figures for England alone.

2972. Now come to Scotland, please?—In Scotland there are 75 places, and among the counties where our members have their business you notice there is one in the Shetland Islands.

2973. All we want is the number of administrations?—85,324 of local analgesics for the year 1908; and of nitrous oxide gas it was 16,281 for the year 1908.

2974. Then in Scotland chloroform and ethyl chloride are

not used?—Not for dental purposes. Do you want the gross totals for Scotland.

2975. Yes, the gross total since members first joined the Society?—The gross total for Scotland is 652,391 local analgesic cases; and the gross total of nitrous oxide administrations is 77,995.

2976. And have there been any accidents?—No deaths. In Ireland there are 65 places, and 32,095 administrations of local analgesics for the year 1908, and 1,941 gas cases for 1908. The gross number of local analgesic cases since members joined the Society is 122,043; the administrations of nitrous oxide 10,458, and no deaths. In Wales there are 36 places, and for the year 1908, local analgesic administrations 37,542; nitrous oxide gas, 1,407. The number of local analgesic administrations since members joined the Society was 204,741; the gross gas administrations 7,078, and no deaths.

2977. I want to get a few more particulars about nitrous oxide. Your members undergo no medical training whatever?—No, excepting that some of them have had medical training.

2978. It is not a necessary part in their course?—It is not a *sine qua non*.

2979. In your opinion a man who has had no medical training at all can safely administer nitrous oxide?—I am quite certain of it.

2980. Do you think that no preliminary examination of the patient is necessary in cases of nitrous oxide?—Yes, there is a preliminary examination. If I was to meet a patient, or a patient came to see me with a view to having nitrous oxide gas, this is the course I follow, and it is the way our members are taught in our demonstrations: the first thing is to obtain the patient's name, address, and age, and one or two questions as to any disease of the heart or kidneys.

2981. The patient does not always know when he has disease of the heart or kidneys?—Certainly not, but still one takes the precaution of asking patients, and if they have the knowledge they may reveal it to you. The next thing after that is to examine the mouth and to find out if there is any obstruction in the throat or nostrils. Then the mouth is examined for artificial dentures, and also for crowns of a loose character, which may under pressure of the contraction of the muscles of the jaws break down under the gag. These are all removed, and the patient is then prepared by having the articles of dress made very loose before the administration of the anæsthetic.

2982. What guarantee have you that the whole of the members of your Society go through this examination?—The guarantee is this. The members of our Society have had their training under their various masters in the preliminary stages. The Society do, and have done ever since its formation, held

practical demonstrations with the subject in the chair, on both nitrous oxide and local analgesics, very frequently throughout the country.

2983. Is any instruction given about local anæsthetics?—Instruction is given very frequently about local analgesics, and I have here one of the Society's journals which records the facts for even 12 months and two years ago.

2984. I suppose even with nitrous oxide you may have failure of respiration, and it may be necessary to resort to artificial respiration. Have your people any training in that?—There is training in artificial respiration, and classes are even now being held by the Society. In London here we have demonstration and tuition classes every month.

2985. I understand that many of your members may have great competency; but I cannot see what guarantee there is that the whole of your members are competent?—No member of our Society or any other man, unless he was insane, would attempt to give nitrous oxide unless he had had some tuition.

2986. Is there any rule of your Society that a member should not give nitrous oxide unless he is assisted by some third person?—Yes, that is a fact? there is a rule to that effect, owing to the claim of a lady on a dentist in Burnley for, I suppose, some indecent assault that she alleged was committed upon her.

2987. Was he a member of your Society?—No, he was on the Register. Afterwards she tried to lay a claim that he was the father of a child as the result of an illegal offence that had happened to her during the time of the administration of this gas. That had been a warning throughout the north of England, and the Society from the very beginning distinctly ordered that no member should administer any anæsthetic without a third person being present.

2988. Not only that a third person shall be present, but do you require that the person who administers the anæsthetic and the person who does the operation shall be different persons?—We do.

2989. So that one can watch the respiration?—One has to focus the light and assist the operator with the light on the mouth while the operator is operating. He focuses the light with his left hand and watches the patient for any failure of the respiratory organs.

2990. You have a great many highly trained men in your Society?—Yes, I am very pleased to say so.

2991. What is their objection to register under the Dentists Act?—It would be utterly impossible for them to register under the Dentists Act at the present time. For instance, one of our men here has been right through an American University, he has passed the whole of the degrees and taken the D.D.S. He is practising in the west end of London.

2992. He could get on the Register, could he not?—He cannot. He has made application, and they tell him distinctly that he will have to sit for the preliminary examination, and go through the whole curriculum; he would have to do his two years of mechanics and three years hospital training over again; and the hardship would be this, that during the whole time he was walking the hospital or taking the curriculum, for five years he would be prevented from obtaining his livelihood, and have to close his practice down, and lose the whole of his clientele.

2993. We were told the other day that there were special provisions by which an American dentist with degrees equivalent to ours can get on the Register?—That is not the case so far as my knowledge goes. The only method by which they admitted them to the Register in the past was by a modified or *sine curriculo* examination. That has been entirely done away with, and to give you an instance in point, here is the Society journal for September 1907, which deals specially with the case of a man here in London. He passed as a student through Michigan University, and qualified there; he was a British born subject having a colonial degree. He was entitled, he thought, to be put on the British Register. He applied to the General Medical Council, and he was informed after inquiry that having, when a student in Michigan University, given his address as Toronto, where his parents resided, he was a British subject, and his colonial degree did not avail, and consequently he could not be admitted.

2994. On the ground that, being a British subject, he must have a British degree, and not a foreign degree?—He was a British subject, and had taken his degree through Michigan University, but they would not acknowledge the registration in England.

2995. On the ground that he was a British subject and had a foreign degree?—On the ground that he was a British subject and had a foreign degree.

2996. But if he had been an American they would have admitted him?—No, they do not admit Americans; the Dental Register says so distinctly. They will only admit, I do not know whether it is Harvard or Michigan.

2997. There are certain recognised Universities?—In the past, but not in the present. This gentleman I was telling you about came over to England with his friend, and he made application to be examined in what they call the modified curriculum or examination, and he was coached by Mr. Dolamore, late Secretary to the British Dental Association. His friend made application to the Royal College of Surgeons, Ireland, and they admitted him, and consequently he was passed through; but when this other gentleman made an application, the Royal College of Surgeons of Dublin wired: "Regret you cannot sit for

examination; writing and will explain." They refused him the modified examination on those grounds I have stated.

2998. Now, is it not worth while your younger men to go through the course?—No. The ordinary curriculum to-day would be in this way. We will presume, for argument's sake, that I desire to put my son into the dental profession. If I want to teach him his mechanical dentistry, none of the hospitals will recognise the three years or two years training he has done with me; consequently, I should be compelled to pay another man 100 guineas premium to teach my son that which I was already able to teach him. Further than that, the cost is considerable, of course, and, as you must admit in the present chaotic state of dental affairs, the man who qualifies to-day and gets through and has to put his brass plate up, is very often a long time before he gets a patient. I have taught no less than two individuals myself who have had their indentures signed by men whose names appear on the Register for a payment of £20. These men are both qualified to-day, and they never saw the inside of their master's workshop.

2999. In your opinion, then, it is not necessary that a man before he practises dentistry should have any what I may call medical physiological training, that he should go through a course of anatomy and physiology, which the L.D.S. people have to do?—It is necessary that he should have a knowledge of physiology and anatomy, and most of our members have.

3000. Is there any prohibition against your members advertising?—There is this prohibition; no member is allowed to issue any circular or advertisement, or exhibit a sign plate, without first submitting proofs to the council for approval. They will not allow any advertisement to go out beyond the member's name and address, and the word "Teeth," "Extractions" and "Fillings," nothing further than that—no testimonials.

3001. No puff?—No, no claim of any superiority, or any equality with any other man.

3002. How about those advertisements that we see sometimes?—They are not members of the Incorporated Society.

3003. Have the Society any control. I suppose you cannot sue for fees?—No, but we can sue for goods supplied.

3004. But not for services rendered?—Not for services rendered.

3005. If, for instance, you have a very troublesome filling of a tooth to do, what do you do?—I have had that many times.

3006. But what would your remedy be there—to sue for the filling?—That is the only thing we could do; but I have never sued anybody; I work my practice on a cash basis.

3007. Does your Society exercise any control over the prices charged by members?—They do to a certain extent. They will not allow members to issue price lists, which in their estimation

would be derogatory to the ethical standard. You are allowed in your own room to have a price list, so that if a client asks you the price of anything you are to hand over that price list, and that is the schedule price you work under ; that is to prevent statements which have been made. It has been said "that they get you inside and find out how much money you are worth, and bleed you for all they can." It is customary, and I believe universal, that our members have their own standard price list, and adhere rigidly to it.

3008. Have you ever taken any disciplinary measures against members of your Society for contravening your rules ?—Yes, we have had one under supervision now for 12 months, and two expelled last year.

3009. DR. WILLCOX.—In the form which has to be filled up in applying for admission to your Society, one of the conditions is that a certificate should be signed by persons of repute saying that the individual is competent ? Are those persons of repute persons of expert knowledge in dentistry ?—They are invariably L.D.S. and medical men.

3010. CHAIRMAN.—Not a grateful patient ?—No.

3011. Would you take the certificate of a layman ?—Not altogether.

3012. Would you at all ?—We should take it if it was one in connection with two others.

3013. For instance, would you take the certificate of a justice of the peace ?—Yes.

3014. Would you take certificates from three justices of the peace ?—No, we would not.

3015. How many expert certificates would you want ?—We demand one—one out of three, and the other two must be men of repute.

3016. Do members of your Society have to undergo any compulsory curriculum in anatomy ?—No.

3017. Or physiology ?—No.

3018. Or medicine or surgery ?—No. I may say we have members who are in the West End of London in practice holding American degrees.

3019. With regard to the administration of gas, do you countenance the same man giving the gas as does the operation ? —If I understand you to say, are we in favour of the man who administers the gas also performing the operation, no, we are entirely against that.

3020. How do you get over that difficulty. Would you have two members of your Society for every teeth extraction operation ? —I do not know any member of our Society who has not got an assistant, and that assistant usually is a well-trained man.

3021. He need not be a member of your Society ?—No, an

assistant could not be a member of our Society, but the Society hold his master responsible to a certain extent.

3022. I should like to know the details of the operation. A man comes to have a tooth out and has gas, and there is a member of your Society with an assistant. Who would give the gas?—As a rule the member would give the anæsthetic and watch his patient, while the assistant takes out the tooth.

3023. But if there were a difficult extraction?—If it were a difficult extraction I am afraid our member would give what they term continuous gas, if he had knowledge of that.

3024. And he would take out the tooth himself?—No; he would be there just supervising the operation. If he is giving gas it would take him all his time to concentrate his mind upon his patient; he has no time for operating.

3025. I am considering a very difficult extraction which the assistant was unable to do?—Under nitrous oxide, do you mean?

3026. Yes?—As a rule, if it is a very difficult extraction there is not sufficient time under nitrous oxide, unless continuous gas was given. If continuous gas was given it is quite an easy matter to keep the patient for two minutes under continuous gas, but if the extraction were very difficult, as you suggest, I should refuse gas, and give a local analgesic and operate myself.

3027. I want to know, in the case of a difficult extraction, whether the member of your Society would assist in the extraction?—I think it would all depend upon the circumstancees. It is one of those cases of emergency that I could not tell you. I suppose you are aware that there are some extractions that not even the cleverest man in the world can succeed in at the first attempt?

3028. Do you find in difficult cases that registered dentists will meet members of your Society in consultation?—Yes, it is so; they will meet them if it is necessary. But, as you know, of course, they are a little afraid of the General Medical Council.

3029. There is some difficulty about it?—There is difficulty.

3030. With regard to local anæsthetics, they usually are given by submucous administration?—With a hypodermic syringe.

3031. Do you agree that these local anæsthetics are poisons?—I agree that they are poisons; but I can also explain why they are given. Local analgesics some years ago were considered to be of a very dangerous character; years ago, when the local analgesic was first introduced to the profession, the danger lay in concentrated solutions being used——

3032. I think all who have gone into that are agreed?—It is the most remarkable thing. I have a medical work here by Dr. Hale White which says that a 15 per cent. solution has been injected in the gums for tooth extraction, but it is not strongly recommended. I do not know any man who would inject more than 1 per cent. solution.

3033. But you agree that they are poisons?—Yes.

3034. And you agree that great care should be required in their use?—Yes, but I contend that they are not dangerous but beneficial to the patient if used in a proper manner.

3035. Certain people are very susceptible to cocaine?—They are, indeed.

3036. A very small dose might produce dangerous symptoms?—Undoubtedly, syncope.

3037. Are you aware that the symptoms produced by an overdose of cocaine may come on some few hours after the dose is given?—Not altogether for some few hours. I was under the impression that a small dose of cocaine was entirely taken away from the system in the course of five hours.

3038. What I mean is that the symptoms might come on, say, after the period of an hour?—I understand you.

3039. You agree with it?—Occasionally they may, in the case of an overdose.

3040. So that in cases where a patient has had an overdose during a dental operation the symptoms might come on afterwards, and a medical man would take charge of the case?—A doctor may be called in, you mean?

3041. A doctor may be called in?—Yes, a doctor would, I presume, if there were danger.

3042. So that it is possible that you may not know every case where there have been symptoms of overdose from local anæsthetics?—Of course, you are here in London, I am up in Lancashire, and I can only assure you that if you had a bad case you would not only hear from the patients, but you would hear from their friends in very quick time. It is quite a common occurrence in the trams to hear people discussing the various things they have done, and only last Friday I saw two actually take out their dentures and compare them one with the other. Lancashire is different from London, and at once, if anything happens, they are instructed, in the event of hemorrhage or anything like that, to immediately come back or send a message so that they may receive immediate attention. I am not an authority, of course, on local analgesics; most of my practice was confined to general dentistry and giving nitrous oxide gas.

3043. Do the members of your Society have any compulsory training in therapeutics?—Not compulsory. A few take the training. I may say, perhaps, that Mr. Bowen, who is with me, was practically the first man to popularise local analgesics throughout Lancashire, and he has been over 20 years administering them.

3044. MR. BRAMSDON.—I take it from your statements that you regard your members as being in every way competent and qualified to carry on the profession of extractors and adaptors of teeth?—I do so absolutely.

3045. Equally as qualified as registered dentists?—Yes, exactly.

3046. Do you consider that it is advisable in some form to restrict the administration of anæsthetics?—Of the alcohols, so far as chloroform and a mixture of the alcohols is concerned, I do.

3047. Would power to administer nitrous oxide gas be sufficient for extractions?—It would not be quite sufficient.

3048. That would mean doing away with local anæsthetics entirely?—I do not think that local analgesics should be entirely wiped out.

3049. Which do you think should not be wiped out?—The administration of novocain, eucain, and cocaine.

3050. But let us put it a little closer, would it not be altogether sufficient for dental purposes to reserve nitrous oxide gas only?—Not quite sufficient.

3051. You do not think it would be?—It would not, because, for instance, a small injection of cocaine, novocain or eucain can be made very often when you are going to cut off a diseased crown from the root with the intention of extracting the nerve for the purpose of crowning that root. The shock otherwise would be very great to the patient, and with a little submucous injection of a local analgesic after the period of one minute, you can at once take your excising forceps and take off the portion of crown that is necessary, and extract the nerve at the same time, without giving the patient any pain whatever, and thus obviate shock to the system.

3052. I should like you to reconsider, if you would, in what manner other than the total abandonment of any proposal to prohibit the administration of anæsthetics except by a legally qualified medical practitioner or a person on the Dental Register, the views of your Society could be met?—The only way I could suggest, if that is the case, is that a Special Register would have to be compiled.

3053. A Special Register of all persons at the present time practising dentistry?—I would not say practising dentistry, but of those persons who could prove that they have been administering nitrous oxide or local analgesics for a given period and a given number of years.

3054. You would repeat in a new form the Act of 1878 upon the question of anæsthetics?—If you like to do so. It is not for me to suggest it to you.

3055. That is the only way you can suggest?—Can you suggest anything yourself?

3056. I am examining you?—The way I look upon it is this: We have many members who have a long queue outside, like they stand outside a theatre, from morning to night, with patients waiting at the door; therefore a medical man would to be in attendance from morning till night, if this Bill, as it is now drafted, became law.

3057. Are there any societies like yours in existence?—None whatever. There is a society which has been formed, which is termed the Dental Mechanics' Assistants, by a man named Callender, of Derby or Buxton, but I think his society consists of himself and a few of his assistants. I do not know any of the members who are connected with it.

3058. I do not mean exactly like yours on all lines, but teeth extractors?—None whatever.

3059. There would be the registered dentists, and your Society, and this Mr. Callender; they are the only three you know of?—Mr. Callender and his assistants.

3060. Those are the only three you know?—I believe there is a Scottish Assistants Society.

3061. Do you know the name?—They are called the Scottish Assistants Society.

3062. Are the members of your Society mostly British members?—No man can be a member of our Society unless he is a British-born subject or a naturalised Britisher.

3063. Then practically he is?—Yes.

3064. Do many of them hold foreign qualifications?—A good many.

3065. Can you give me any idea of the number?—I could not without going through the books.

3066. Are there any Americans?—Americans, Frenchmen, New Zealanders, Australians; in fact we have a Frenchman who passed through the Schools of Medicine in Bordeaux.

3067. Referring to those mild doses you spoke of just now, are you sure that in all cases complete anæsthesia is brought about by cocaine, and so on?—If the tissues are healthy.

3068. You have reason to believe that complete anæsthesia is brought about?—Yes.

3069. Are your fees lower or higher than the genereal run of dentists?—The fee for extraction in Lancashire is 6d.; with local analgesia, 1s.; and with nitrous oxide, 2s. 6d.

3070. But is that less, or about the same, or more than dentists' fees?—It is less.

3071. May I take it, then, that you meet with a lot of cases of poor people?—Yes.

3072. And you, as it were, cater for the poor?—And the middle class as well, the working community, the industrial classes. May I say that this year I have injected local analgesics for medical men twice, and taken out two teeth with gas for another.

3073. You were referring a little while ago to all those persons who were on the Dental Register, but who now are pursuing apparently other than dental occupation?—A percentage.

3074. Have you any reason to suppose that they practise dentistry?—Yes, I know many men who practise dentistry.

3075. Taking as a whole those men whose names were on the register but are following other occupations?—At the time of registration, do you mean?

3076. I am speaking of now?—Yes, many of them are following dentistry to-day. Many are not.

3077. Do you know if any of those people administer anæsthetics now?—Yes, I could give you an instance in point, of a man in Manchester. He has been on the Register ever since the Act of 1878, though following other occupations, and he only commenced dentistry this year.

3078. You regard the administration of nitrous oxide, at least, as extremely safe?—Yes, absolutely safe. I go further than that; I say I am positive it is safe.

3079. Are the members of your Society empowered to engage in any other business?—No.

3080. Nor practise anything?—No, they must be absolutely engaged in the practise of dentistry.

3081. Have you any registered dentists in your Society as well?—No, we have not; but we have sons of both registered dentists and L.D.S.'s.

3082. CHAIRMAN.—May I take it for granted that if a man is struck off the Register of Dentists, you would not admit him to your Society?—We refuse to admit men who are struck off for malpractices.

3083. Take the case of a man who has failed to pass his examinations; would you admit him?—If he could fulfil the other conditions.

3084. If he failed to pass his examination for the ordinary L.D.S.?—We have plenty of those. But they have satisfied us of their practical capabilities. I suppose it is not every practical man who has a good memory.

The witness withdrew.

PROFESSOR HENRY HARVEY LITTLEJOHN, M.A., M.B., C.M., B.Sc., F.R.C.S. (Edin.), F.R.S. (Edin.), examined.

3085. CHAIRMAN.—I think you are Professor of Forensic Medicine in the University of Edinburgh?—I am.

3086. And formerly, I think, you had some English experience as medical officer of health for Sheffield?—Yes.

3087. So that you have a double experience in England and in Scotland?—Yes, to some extent.

3088. During the last 20 years, I think, you have been engaged in the teaching and practical work of medical jurisprudence?—Yes.

3089. And I think you are on the Council of the Medico-Legal Society?—I believe I am.

3090. At any rate, you have read some interesting papers before them?—Yes, I am a member of the Society.

3091. I believe that personally you have made several thousand post-mortem examinations?—I have.

3092. And also, on behalf of the Crown in Scotland, you carry out other medico-legal investigations?—I do.

. . . . . .

3282. You have made very many post-mortem examinations. In the case of death under an anæsthetic does the post-mortem show you much apart from what I call the clinical evidence, the collateral evidence?—A post-mortem will not enable you to come to any definite conclusion that death was due to the anæsthetic.

3283. I believe in Scotland you use chloroform much more than we do in England?—Yes.

3284. Is that from tradition?—I think it is partly from tradition and partly because there is a belief that chloroform is the best anæsthetic.

3285. When you say the best, do you mean the safest or on the whole the most satifactory?—The most satisfactory, and I presume that the safest is included in that.

3286. Have you had to inquire into any deaths under chloroform?—Yes, many.

3287. Do you think that chloroform is as safe as ether?—That is a matter for a practical surgeon. I wouid uot like to give an opinion.

3288. In your precognitions you do not deal with that point?—In my evidence when I inquire into a case, I have to judge whether the case was one in which chloroform would have been the best anæsthetic or whether a local anæsthetic might not have been used with advantage.

3289. Have you had any deaths under local anæsthetic, cocaine or stovaine, in your personal experience, having made so many examinations?—No.

3290. DR. WILLCOX.—Have most of the deaths under anæsthetics that you have investigated, been deaths from chloroform?—I cannot give you exact statistics, but in very few cases could I say that chloroform was the direct cause of death.

3291. Have there been many deaths which have occured under ether?—I could not give you information as to that.

3292. Most of the deaths under anæsthetics which you have investigated have been deaths where chloroform was the anæsthetic administered?—Yes.

3293. CHAIRMAN.—I suppose you cannot give us any figures as to the number of deaths from chloroform in Scotland?—I could not give you that just now, and even if I could they would only be those in Edinburgh.

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MR. CLINTON T. DENT, M.C. (Cantab.), F.R.C.S., examined.

3327. CHAIRMAN.—You are a Master of Surgery of Cambridge and Fellow of the Royal College of Surgeons?—Yes.

3328. And you are Senior Surgeon of St. George's Hospital —Yes.

3329. And you have been Chief Surgeon to the Metropolitan Police since 1904?—Yes.

. . . . . .

3453. You draw a distinction, of course, between deaths under anæsthetics and deaths caused by anæsthetics?—It is a matter of the profoundest difficulty in grave surgical cases to distinguish.

3454. Whether the anæsthetic plus shock, or shock alone, was the cause of death?—Whether one of three things: the anæsthetic, the operation, or the disease that led to the operation. It is a matter of the profoundest difficulty to assign the proper proportion to each.

3455. You do not think the coroner and his jury, drawn in the ordinary way from the Parliamentary Voters' List, is a good tribunal to determine such a delicate question?—I feel certain that the jury is a very bad tribunal.

3456. DR. WILLCOX.—Do you think the medical assessor should have had special experience in the use of anæsthetics?—I think not; I do not think that would be necessary. He should be a man of ability, a competent person. He would learn about anæsthetics, after all, as easily as about any other branch.

3457. He would appreciate the special point relating to anæsthetics if he had had a special training?—Well, it would be an advantage, but certainly you would not choose an assessor who did not show knowledge of that or of many other branches which might be named.

3458. CHAIRMAN.—Have you any opinion on this point. Various anæsthetics are in use; but do they differ much in relative safety. First of all take nitrous oxide?—It is very safe.

3459. When we come to ether or chloroform, is there always a certain danger there?—Always, whenever ether, chloroform, or similar respirable anæsthetics are used, skill is required if you wish to have the maximum of safety.

3460. Skill, may I suggest, in three directions: first of all, in the preliminary examination of the patient?—Yes.

3461. Secondly, in the administration of the anæsthetic?—Yes.

3462. Thirdly, in the case of unfavourable symptoms supervening, in knowing what to do and what remedies to apply?—I would add a fourth, which is more important to my mind than any, that is, the choice of the anæsthetic.

3463. Is that left to the anæsthetist, or is it chosen by the surgeon?—That is left practically to the anæsthetist.

3464. When he is a skilled man?—But it is constantly in fact, I think, except in perfectly straight-forward cases, discussed between the two; in hospital work it is.

3465. And in private practice?—Yes, and in private operations, too, you always discuss it. If I invite an anæsthetist to give an anæsthetic for me in private, I tell him all I know about the case and about the kind of patient before ever he sees him.

3466. Is it material whether the patient is an alcoholic subject?—Undoubtedly.

3467. And, I think Dr. Hewitt told us, a very heavy smoker?—Yes, and so on. The choice of the kind of anæsthetic implies much more than merely deciding whether you put a chloroform or ether bottle into your bag before you start.

3468. Do not surgeons require a given anæsthetic sometimes for the purposes of an operation; do not they require much greater stillness and relaxation in some cases than in others?—Yes. Choice implies more than that; it implies a knowledge of when to change the anæsthetic during administration. That is constantly done.

3469. Does it ever happen that the surgeon for his purely operative purposes would like one anæsthetic, and the anæsthetist says, "For the sake of the patient I must have another"?—Yes, often he says, "I would rather not give ether or chloroform;" then I say I must be guided by him.

3470. We were told by Dr. Littlejohn to-day that chloroform was much more given in Scotland than in England?—Yes, it has always been so.

3471. Is that a matter of tradition?—I think it was owing to Sir James Simpson and Lord Lister advocating it.

3472. In your opinion is there any great difference in safety between ether and chloroform?—I regard ether as the safer of the two.

3473. And the mixture?—The mixture in suitable cases is very safe.

3474. DR. WILLCOX.—Take ethyl-chloride, do you consider that there is risk there?—I do not like ethyl-chloride as an anæsthetic from an operating surgeon's point of view very much.

3475. CHAIRMAN.—But as a matter of safety?—I do not know; I am not an anæsthetist, but I have only had it given in a few cases. I have discussed it with anæsthetists often, and I have come to the conclusion, agreeing with their view, that it is not a very safe anæsthetic.

3476. We have been told that it was the anæsthetic sometimes used by unqualified dentists. In your opinion, is it a safe anæsthetic for unqualified persons to administer?—Not unless they have been very carefully trained in it to the exclusion of the others.

3477. You know that there is a proposed Bill for the purpose

of prohibiting the use of general anæsthetics by persons who are not qualified?—Yes.

3478. Do you agree with that generally?—Yes, with that provision I certainly should be in agreement.

3479. Would you make any exception in the case of trained men holding the L.D.S. qualification using nitrous oxide?—I have rather changed my views recently about that, about the L.D.S., and so forth. The L.D.S. of England implies a fairly good training. Perhaps I might put in these regulations, which may be of interest *(handing in the same)* as showing the subjects for the final examination. The last item of all, you will notice, is Anæsthetics, with special reference to their use in dental surgery.

3480. That, of course, applies to all who are now coming in?—Yes, truly; but you cannot distinguish. I think it is a dangerous thing for a dentist to give even nitrous oxide if he is single-handed. To give it and to operate is not right. I think there should be always a second, but he might be another L.D.S.

3481. We had some curious figures this morning from the Society of Extractors and Adaptors of Teeth. It seems that, in England alone, the members of that Society have administered nitrous oxide in 1,249,167 cases without an accident?—Unqualified?

3482. Unqualified dentists. That seems to show, at any rate, that nitrous oxide is very safe?—Yes, it is very safe.

3483. But, coming to the practical point, would you except nitrous oxide from the Bill or not?—I would not except it from the Bill if there were twenty million cases without an accident. It should not be given by unqualified persons.

3484. You would prohibit the giving of nitrous oxide by unqualified persons?—Yes.

3485. You would allow it to qualified dentists?—Yes.

3486. But not to unqualified dentists?—No, not to unqualified dentists.

3487. Or a bone-setter or a herbalist, an unqualified person generally?—The bone-setter does not use nitrous oxide much, I think.

3488. But your opinion would be, as regards general anæsthetics, that, with the exception of nitrous oxide, they should only be administered by qualified medical men, and that, as regards nitrous oxide, it should be administered either by a qualified medical man or by a qualified dentist?—I have seen the Bill, but I do not remember its proposals. I do not think one could except nitrous oxide, and say to a dental surgeon, "You may give that anæsthetic and no other." I think if you allow him to give that, you must allow him to give any general anæsthetic.

3489. On account of its great safety and easy administra-

tion you cannot draw a distinction in the case of nitrous oxide? —No, I could not draw a distinction. Just at present nitrous oxide is the best anæsthetic for short operations that there is. It may be superseded to-morrow.

3490. DR. WILLCOX.—Do you consider that a medical examination should be made before a patient is given nitrous oxide?—It is desirable.

2491. Do not you think that in the case of aortic disease there would be great risk in giving nitrous oxide?—There would be risk, but there would also be risk in extracting a troublesome tooth without it.

3492. But there would be considerable risk?—Either way. Broadly speaking, if a person has heart disease, and one may include aortic disease in that——

3493. Aortic disease is the most dangerous form?—Yes. I would prefer him to have an anæsthetic for a surgical operation, because I think he runs less risk.

3494. CHAIRMAN.—The shock is as likely to kill him as the anæsthetic?—More likely.

3495. DR. WILLCOX.—The struggling under nitrous oxide would be particularly dangerous to a man with aortic regurgitation?—Yes.

3496. Chloroform would be best?—Chloroform would be best, but it would require to be skilfully given. But in that million cases I am sure there were some with aortic regurgitation.

3497. CHAIRMAN.—That brings me to another point. If the administration of anæsthetics by unqualified persons was prohibited, would you make any exception for a nurse or midwife or other person attending a woman in childbirth?—No, I would not let her give it.

3498. Would you not let a nurse give a whiff of chloroform in childbirth in the absence of the doctor?—Well, under doctor's orders, perhaps. There it is used as an anodyne.

3499. It is not pushed?—It is not pushed, but you could not feel sure that it might not be pushed accidentally.

3500. We were told—I do not know how far it is a known medical fact—that a woman in childbirth is specially tolerant of chloroform?—Yes, it is true, I believe.

3501. There is less danger in giving it in childbirth than in any normal condition?—It is only given in very small quantities, and you may go on giving it for many hours.

3502. DR. WILLCOX.—Is it your opinion that only legally qualified medical men should give respirable general anæsthetics?—Yes.

3503. CHAIRMAN.—Would not that inflict great hardship upon the poor, who cannot afford the price of an anæsthetist but want to have a painful tooth out?—I think not, for hospitals are so multiplied now all over the land that they get their anæsthetic for nothing.

3504. Now as to local anæsthetics, do you think that any restriction ought to be placed on the administration of local anæsthetics by unqualified persons?—By a local anæsthetic, do you mean anything painted or applied on the part?

3505. Well, there is that difficulty? it is difficult to define?—When one comes to punctures, and so forth.

3506. Take a hypodermic injection; take cocaine, for instance. It has been suggested to us that a hypodermic injection of cocaine is a dangerous thing that ought to be prohibited in the hands of non-qualified persons?—I do not think it is possible to lay down any general rule about local anæsthetics—those in use at the present moment, I think, come under such different categories. I may freeze the part and produce local anæsthesia; I may apply a sponge of strong carbolic on the skin and it will act as an anæsthetic.

3507. You may apply a drop of carbolic acid to a decayed tooth?—Yes, and it will become an anæsthetic. Those are perfectly safe things, but the injection of cocaine into the gum, or the injection of cocaine into the lip or the face for the removal of a tumour, may be highly dangerous. The injection of stovaine and such like, or eucaine, into the spinal canal may have serious consequences.

3508. But it would be difficult in legislation in the general words of an Act of Parliament to deal with those matters, would it not?—I think the only possible way is to give some person or body the power to place certain drugs on a proscribed list, and say, "These are dangerous things, and must not be administered by an unqualified person."

3509. But even then you get into difficulty. Take this case. Supposing a man with toothache goes into a chemist's shop and asks for a small bottle of camphorated chloroform, and he rubs some on to his gum, you would not prohibit that?—No, I think not.

3510. Even in cases of injection of morphia in your hospital, I suppose it is the sister or staff nurse who actually injects it, and not the doctor?—The sisters are allowed to do it actually, but it is prescribed by somebody else. It is prescribed by the medical man; he is responsible.

3511. But when it comes to legislation, it is very diffiicult to deal with anything of the kind other than a general anæsthetic producing unconsciousness for the purpose of an operation?—I think that the other local anæsthetics will be best left wholly untouched at present. I do not see how any practical legislation could touch them.

3512. Have you had any experience yourself at St. George's Hospital with stovaine?—No; our anæsthetists, from what they have seen, seem to be, generally, against it.

3513. It is too dangerous, you think?—I have never used it

in my own practice, but I can conceive of cases where I would use it.

3514. I have only one general question to ask you. I suppose our knowledge of local anæsthetics for operative purposes is rather in its early stages at present?—No, we have a great many drugs, but I think our knowledge of spinal anæsthetics is still very imperfect.

3515. I suppose, if we could get over the difficulties arising from their administration, they would be largely used in place of the general anæsthetics?—I think not. I believe the respirable anæsthetics will hold their own for a long time to come.

3516. So that legislation with respect to general respirable anæsthetics is not likely to become obsolete soon?—I think not; they have a great field for a good many years.

3517. DR. WILLCOX. In your opinion, should persons who are neither qualified medical men nor qualified dentists be allowed to inject under the skin or mucous membrane, cocaine, eucaine, and novocain, and these allied drugs which are used as anæsthetics?—I would rather they did not; but, again, I do not think it would be any use to prohibit it by legislation. I think that they must take the responsibility of these things. If harm arises an inquiry must be held, and they must be blamed and take the consequences. They should know that these things are dangerous.

The witness withdrew.

ELEVENTH DAY.

Tuesday, 23rd March, 1909.

PRESENT:

SIR MACKENZIE CHALMERS, K.C.B., C.S.I., *(Chairman).*
SIR HORATIO SHEPHARD, LL.D.
MR. ARTHUR THOMAS BRAMSDON, M.P.
MR. J. F. MOYLAN, *(Secretary).*

SIR T. LAUDER BRUNTON, Bart., M.D., F.R.C.P., F.R.S., examined.

3946. CHAIRMAN.—You are a Doctor of Medicine of the University of Edinburgh, an Honorary Doctor of Medicine of Trinity College, Dublin, an Honorary Doctor of laws in the Universities of Edinburgh and Aberdeen, Doctor of Science of the University of Edinburgh, Fellow of the Royal College of Physicians, London, and also a Fellow of the Royal Society and a good many other medical and scientific societies both at home and abroad?—Yes.

3947. At present I think you are Honorary Physician to St. Bartholomew's Hospital?—Yes.

3948. But for many years you were on the staff?—For many years I was on the active staff of the hospital.

3949. And for nearly 45 years you have given much attentions to the action of drugs and have lectured on the subject for nearly 30 years at the Middlesex Hospital and St. Bartholomew's Hospital?—I have.

3950. You are the author of a good many works on the action of drugs?—Yes.

3951. And those works have had a large cirulation here and in America, and they have been translated into French, Italian, German, and Spanish?—Yes.

3952. I think in particular you are the author of a standard book on Pharmacology and Therapeutics?—I am.

3953. That has been adapted for American use as well as English use?—Yes.

3954. You also during your medical career have taken a considerable interest in and done considerable work experimentally?—I have.

3955. I see you have studied and worked in the laboratories of Professor Brücke at Vienna, Professor du Bois Reymond at Berlin, Professor Kühne in Amsterdam, and Professor Ludwig in Leipsic?—Yes.

3956. I think in 1889 you were a member of the Hyderabad Chloroform Commission?—Yes.

3957. That was the second Commission?—Yes.

3958. You went out to India and carried out a great many investigations there into the action of chloroform?—Yes.

3959. I do not know whether it extended to ether and other anæsthetics?—It extended to ether, but there were certain difficulties in determining the action of ether in Hyderabad, because the ether evaporated so rapidly that we were not able to keep it at the high temperature.

3960. Would you tell us something about the second Commission, and how you came to go out to Hyderabad?—At the request of Colonel Lawrie, the Nizam of Hyderabad had instituted a Commission, consisting of men in his own service, to examine into the action of chloroform. They reported that it invariably killed by paralysing the respiration and not by affecting the heart. This conclusion was doubted, and a second Commission was instituted, of which Colonel Lawrie was President and Sir Gerald Bomford, K.C.I.E., now Director General of the Indian Medical Service, was secretary. I attended as the representative of the *Lancet*. We made a number of experiments by giving chloroform to animals without any operation or without tying them up in any way.

3961. So as to get the pure normal operation of chloroform *per se*?—Exactly. Every one of those animals died by stoppage

of the respiration, and if examined immediatly after death the heart was found to be still beating.

3962. You say the heart was found to be still beating. Would it have been possible by artificial respiration to restore life in those cases, or do you mean cases which had gone beyond the possibility of restoration?—Almost certainly we should have been able to restore them by artificial respiration had that been done. We thus completely confirmed the finding of the first Commission, that death from chloroform, *per se*, is due to stoppage of the respiration, but we felt that it was necessary to imitate, as nearly as possible, the conditions under which patients are when undergoing surgical operations.

3963. That is, by introducing a new factor, namely, the operative factor?—That is, introdúcing the operative factor and and the restraint of position. In operations thus performed upon animals, we occasionally met with, just as occurs in surgical operations on man, instances where death appeared to begin with stoppage of the heart and not with stoppage of respiration. It was, therefore, clear that death could not be said to be caused by the administration of the anæsthetic, although it occured during the anæsthesia.

3964. We had some interesting evidence here the other day from Dr. Hewitt, whom you know very well as an eminent anæsthetist, and without discussing the theory he told us that in practice what he found to be expedient was this, that up to a certain stage of anæsthesia, even in operative cases, all you had to do was to watch the respiration. When once that stage had passed into still deeper anæsthesia, you had to watch the heart as well and attend to the pulse and the heart sounds. Have you any comment to make upon that?—Dr. Hewitt's experience is very much larger than mine, because he has given anæsthetics in so very many more cases. That is not quite in accord with what I should have imagined or what I should have deduced from our experiments upon animals. So long as the respiration is quite free, then I think there is very little risk from the heart, that is to say, from the heart provided that the anæsthesia be thorough and complete. But there is very great risk indeed from the heart in cases where the anæsthesia is imperfect.

3965. Because there surgical shock comes in?—There surgical shock comes in. Perhaps I may give you one illustration of this. A gentleman had a condition of the liver which made us suspect an abscess, and he was given an anæsthetic, and a puncture was made in the liver during deep anæsthesia.

3966. An exploratory puncture?—An exploratory puncture. It produced no apparent effect upon the patient. That was repeated again and again, and nothing was got out except a very small quantity of pus. But just as the patient was beginning to

come out the operator said : "Let me try once more." He pushed in the trocar again. Immediately the patient's face became blanched, he became pulseless, and died. The case there was one clearly, I should say, of surgical shock. So long as the patient was completely under the influence of chloroform the operation repeated again and again seemed to have no effect, but the moment he was just beginning to come out he simply died under it.

3967. At that stage, coming out of the anæsthesia, would the shock be caused by the feeling of pain?—No, I believe he was absolutely unconscious; put the shock occurred before the sensation returned.

3968. Sensation returns rather late, does it not?—Very often it returns quite late.

3969. You may have analgesia without anæsthesia?—Yes, it seems to come on at the beginning sometimes of the anæsthesia, and again to occur towards the end of the anæsthesia.

3970. Before we go on to your next paragraph may I ask you this. I daresay you read the report of Professor Gaskell's cross-circulation experiments?—Yes.

3971. Which to his mind showed that chloroform might act directly on the heart. Have you any opinion as to the validity of that view?—As I said at the time, it was a pity that his experiments were somewhat complicated by two things; one was by the injection of morphine, if I remember rightly; and the other was by the use of peptones, because peptones have a very strongly depressant action upon the circulation, *per se*, so that I was not certain of the cruciality of the experiment. At the same time one can say perfectly well that chloroform, if administered in a sufficient quantity, will paralyse the heart. If you blow chloroform into the lungs of an animal you can stop the heart dead—paralyse it. But that is a different thing from inhaling chloroform; because when an animal inhales chloroform the respiratory centre is first acted upon and respiration ceases before the heart, and so the animal cannot take enough into its lungs to act upon its heart.

3972. To go on with the evidence that you have kindly sent us, you draw a distinction between deaths under anæsthetics and deaths from anæsthetics?—Precisely, perhaps I may be allowed to give an illustration to make my meaning clearer. If a man is strangled in his sleep by a burglar, his death is not due to the sleep, except in so far as the sleep prevented him from noticing the entrance of the burglar, and possibly escaping. I have heard of a drunken man being drowned in two inches of water by falling on the road with his nose and mouth in a puddle. This man's death could only be said to be due indirectly to the alcohol he had drunk, although it happened during intoxication. In the same way, death may occur from choking, or possibly from

shock, during chloroform anæsthesia. The death there is not due to the direct action of the anæsthetic, and yet it may have been induced by it, because the patient's unconsciousness hindered him from coughing and ejecting some substance which had entered his larynx and was choking him, or prevented the reflex contraction of the vessels, which in the waking condition might have saved him from shock.

3973. You draw the old distinction there between *causa causans* and *causa sine qua non?*—Yes.

3974. If I rightly understand you, when death occurs under an anæsthetic you may divide the cases into three classes: first, the anæsthetic may be the cause of death?—Yes.

3975. Secondly, the anæsthetic plus some other condition may be the cause. It may be a contributory cause?—Yes.

3976. Thirdly, it may be a mere accidental concomitant?—That is so, quite.

3977. For instance, I suppose hemorrhage may be the cause of death; surgical shock may be the cause of death?—Yes, very often I think asphyxia.

3978. What do you mean—mechanical asphyxia or asphyxia caused by paralysis of the respiratory centre?—Asphyxia, more or less mechanical; that is to say, it may be due to blood or regurgitated food falling into the larynx just as the patient is coming to, or it may be due to spasm of the larynx caused by a drop of blood or some saliva or particle of food getting into the larynx, not large enough to choke the passage but large enough just to bring on spasm, which, together with the action of the anæsthetic, would cause death. This spasm sometimes occurs from very slight causes and is most distressing. The things that occur to oneself make a deeper impression on one than those which occur to others. Once I was very nearly drowned in a swimming bath, because a single drop of water had got into my nose and caused spasm of the larynx. Fortunately the water was not deep enough to drown me, and I stood up choking, gasping, trying to get the air into my larynx and chest; but the larynx was firmly closed and I could get nothing in. The same thing occurred to me once again when, walking along the street shortly after a meal, some food regurgitated, and instead of the whole being again swallowed, a minute particle seemed to have got into the larynx and caused spasm of the glottis; and I had to stand at a shop window trying to fill my chest with air and was quite unable for a while. At last the spasm yielded with a loud crowing inspiration, and I got relief. But had such a thing occurred when I had been partially under the influence of chloroform, I have very little doubt that I should never have recovered.

3979. On that question arises this: after administration of an anæsthetic, however carefully administered, the patient is usually sick, is he not?—Yes.

3980. Is that a source of danger?—That I believe to be a very great source of danger.

3981. No care in administering an anæsthetic can prevent it?—No.

3982. A patient operated on with an empty stomach, on return to consciousness, is very apt to suffer from sickness, is he not?—Yes. If the stomach be completely empty sickness is not so liable to come on, and if they do retch they are not so apt to get up any food. It is when food gets up into the pharynx and then a deep inspiration is taken, a little is caught back, and that causes spasm of the larynx.

3983. Sickness, I believe, does not come on after nitrous oxide?—No.

3984. It is only after chloroform or ether?—Yes.

3985. So that in administering chloroform or ether there is always a possible element of risk?—Certainly.

3986. And that risk, I suppose, is very much mitigated if the anæsthetist is a skilled man knowing what to do under particular emergencies which arise?—Certainly.

3987. Is it known exactly what causes sickness on recovery from chloroform or ether; why some people are sick and others are not?—That is more or less hypothetical causation. It is supposed by some that it is due to the ether or chloroform being secreted by the mucous membrane of the stomach, in the same way that one knows that tartar emetic injected in the blood is excreted by the stomach.

3988. It is an attempt made by nature to get rid of the poison?—Yes, but so far as I know there are no exact experiments upon the subject.

3989. Before you go on, may I ask you a general question. Do you think that the whole subject of anæsthetics has been scientifically exhausted, or is there room for further experiment and further research as well as further clinical observation; do you think we shall learn more about it?—I think there is very great room still, especially in one department, and that is in the relationship of anæsthetics to surgical shock. I may say that that was one of the subjects that we proposed to do at Hyderabad, and I think, perhaps, we allowed our humanitarian feelings to interfere too much with the work we ought to have done. We felt that we did not wish to inflict any unnecessary pain upon animals, and in all the experiments that we did, even those on surgical shock, I think, perhaps, we did not allow the animal to come out sufficiently far sometimes from the anæsthetic; so that we did not get the effect of surgical shock so well manifested in the case of the animals upon which we experimented as we should have done possibly, and perhaps not so well as really occurs in the cases of men who are being operated upon for some reason. But I believe in that department, specially, there is room for a great deal more work.

3990. But still the surgical shock, as I understand, can be felt although there may be complete analgesia?—Certainly. That occurs when there is no sensation whatever; but one does not know exactly how far the anæsthetic interferes with it. One knows that if the anæsthetic is administered to such an extent as to stop all reflexes, then you do not get surgical shock, if it is sufficiently far pushed.

3991. But then you very often get death from the anæsthetic, do you not?—No, I think not. My own belief is that death is not so much from the anæsthetic as from the shock.

3992. You think that where there is not, so to speak, artificial asphyxia, the shock is more ordinarily the cause of death than the anæsthetic itself?—Yes. In saying this I am, of course, judging from experiments on animals, and perhaps my views might not be shared by men who have got more experience than I in administering anæsthetics in surgical cases, so that I should defer to their opinion. I only speak from what I have learnt from experiments upon animals.

3993. When anæsthesia is pushed sufficiently, do you hold the view that no pain is suffered or that no pain is recollected?—I was eight times under ether or chloroform in three months for surgical operations, and the question is very difficult to answer; but so far as I was concerned, it might have been a table or a chair that was being smashed; it was nothing to me whatever. But, at the same time, I believe in one or two of the cases I made a great noise as if I had been hurt.

3994. It is possible to have both movements and cries without pain?—Yes, I believe so. I went quickly under, but I cried while I was so far under that I did not feel. So far as I am concerned, I did not know. Practically, it seems to me that the question is unimportant. If a man does not recollect anything of it afterwards, it has no effect upon him so far as he is concerned. Only it is just possible that in that case when he is not thoroughly under, and apparently evidences sensation by a cry, he might evidence also the effect of injury upon him by shock.

3995. I suppose, to some extent, one can judge by this: that when a man comes back from anæsthesia he perfectly well remembers the sensations he experienced in going under?—Yes.

3996. But he has no recollection of pain?—No recollection whatever of pain.

3997. It is not a little piece taken out of his life, so to speak, but he recollects up to a certain point, and therefore probably there is no pain suffered?—There is no pain suffered. Speaking also from my own personal recollection of nitrous oxide, I had once a tooth out. I was told to go on counting; I counted to 11, and then was going on to 12, and they said: "Stop—it is done." Between 11 and 12 the thing had been done without my knowledge. Personally, I suffered no pain, and had no recollection of it afterwards.

3998. One further question. You can perhaps tell us about the administration of anæsthetics. Assuming that only very light anæsthesia is produced, I take it that the sensation of pain dies out gradually, there is just dulness and then complete loss of sensation; or does the sense of pain go suddenly?—Unfortunately, I cannot tell that from my own experience, because I have not been subjected to pain at the time I have gone over; but consciousness appeared to go suddenly.

3999. I was asking for this reason: supposing a man was too lightly anæsthetised there might be a great dulling of pain, but the actual pain of the operation might act in two ways—in the first place it might be greatly dulled; or you might, so to speak, wake him up absolutely from the anæsthesia by a sharp pain. It perhaps is not known how it operates?—I fear I cannot give a definite answer to that. One can say, of course to a certain extent, that when sensation has been abolished by opium, by very sharp pain you may succeed in waking the patient up.

4000. Entirely?—Not entirely, but to a considerable extent; because painful applications are the methods of awakening a patient from opium stupor. The application, for example, of a strong electric, faradaic current to the skin is one of the methods of waking a patient from the opium coma; another is flicking him with towels; another is striking the forehead with the nails. But all these painful applications, although they wake him, to a certain extent do not wake him completely; you have to repeat them again and again, and as a rule you can wake him to half-consciousness, and he will lapse again into coma unless you keep up continually repeating the painful application. And then when they do come out I doubt if they are conscious of it.

4001. But on other grounds, on the ground of avoiding shock, which in your opinion is quite distinct from the conscious feeling of pain, you think anæsthesia as a matter of safety ought to be pushed to a certain point?—I think so. May I say that my attention was first drawn to this by Snow's book on chloroform, where he recorded a number of cases in which chloroform was first used, and I was struck by the fact that so many deaths occurred just after they had begun to inhale.

4002. Before any operative procedure had begun?—Before any operative procedure had begun. Emotion has a great power, of course, in causing people to faint and sometimes to cause fatal syncope. I was told that on the voyage out to South Africa a great number of young officers fainted when they were being vaccinated. And what is the most curious instance I have ever known, there were two brothers—I think you probably know both of them—who fainted always if they saw a drop of cold blood; they fainted, and dropped on the floor unconscious. Yet both these men got the Victoria Cross in the Afghan War. Hot blood did not matter.

4003. To resume—I fear I led you rather astray, before the introduction of anæsthetics do you know of any deaths from shock?—Before the introduction of anæsthetics many patients died from shock, but now such cases are rarely recorded. Almost the only case of death upon an operating table that I have ever seen was not due to an anæsthetic, but to shock. It occured in the case of a man in whom the upper jaw was being removed for cancer. The preliminary incisions were made under chloroform, and then the anæsthenic was allowed to pass off lest the man should be choked by the blood from the wound running into the larynx. The operation was a long one, and it was only during the first few minutes that the patient was under chloroform. The pain which occurred after the anæsthetic had passed off caused shock, which proved fatal before the operation was completed. But death through shock may happen during partial anæsthesia, and the period of danger usually is before the anæsthesia has been completely established, or just when it is commencing to pass off. There are certain arrangements of the nerves and circulation in the body which tend to prevent death. When consciousness is complete, they all act together and fulfil their function well. When consciousness is entirely abolished, no one acts more than another, and, again, there is little risk. It is when the relations to one another are disturbed in imperfect anæsthesia that danger comes in.

4004. May we pause there a moment. When death occurs under an anæsthetic (I am not saying from it) it is a difficult and delicate inquiry to determine the actual cause of death?—Very much so. Perhaps I may illustrate this by a similar thing to being under anæsthesia, that is, drowning. I had occasion to study this subject a good many years ago, and I was very much struck with the fact that half the people killed by falling into the water are not drowned in the ordinary sense of the term. When you come to examine the bodies post-mortem, instead of finding the signs of asphyxia, namely, a loaded venous system and distended right ventricle, the heart is found empty. These people have died of shock, fright, not from the water.

4005. Do you mean emotional shock or shock of cold?—I cannot say; but they have died from shock, or, as Caspar terms it, Neuro-paralysis. This Neuro-paralysis as Casper terms it, is just a sudden stoppage of all the functions of the body.

4006. Or take the case one often hears of, of a good swimmer suddenly going down. Is that not probably caused by syncope or cramp?—I think a great many of those cases may be due to cramp, but I think they are very often due really to want of breath. When a man begins to find his powers are flagging he is very apt to throw up his arms. That seems, if Robinson be right, to be a curious example of what may be called atavism; that as man was very probably descended if not from monkeys,

at least from arboreal apes, when safety was gained by hanging from trees or clutching a branch overhead, so man in his greatest extremity throws up his hands. That is shown in the case of Webb, who was drowned in the rapids of Niagara. He was seen, just before he went under finally, to throw up his arms.

4007. The finest swimmer, perhaps, that ever lived?—Yes.

4008. I want to raise one further question on this point. You say that the inquiry is necessarily a complicated one. Does a post-mortem examination throw much light on it or not?—A post-mortem examination throws light upon it in this way, that it would show whether the death was due to asphyxia or to shock, but the shock or the neuro-paralysis may be due to many things. What I mean is this, neuro-paralysis might be due to the actual shock of the operation, but it may be due, as in the case of a man falling into water, really to spasm of the glottis. Caspar examined not only people who had been drowned but people who had been throttled, and the man who had been throttled or hanged often died of shock and not of asphyxia.

4009. Actual shock?—Yes.

4010. Without, of course, the neck being in any way fractured?—Certainly, there was no fracture of the neck in the case where it was done by throttling.

4011. I was asking rather for this reason. In the case of death under chloroform or ether, under an anæsthetic, is a post-mortem by anybody but a very skilled expert of any use? Are the post-mortem appearances sufficiently well known and sufficiently well marked for anybody to make an effective post-mortem?—Even a man who had no special skill could distinguish between the condition of the heart in asphyxia and neuro-paralysis; but the deduction to be drawn from that is one o very considerable difficulty.

4012. You want, then, a very careful post-mortem plus certain, what I may call, clinical evidence, the evidence of people who saw the actual symptoms preceding death?—I think so. I think it would be very difficult indeed to be quite sure of one's conclusions from the post-mortem evidence alone. For example, to take one of Caspar's observations, you examine a body, you find the symptoms of shock, and unless you knew that that man had actually been throttled, or unless you found upon his neck the marks of the burglar's fingers, you could not tell that that man had been throttled.

4013. You would simply say he died from shock?—That he died from shock, but the nature of the shock must be shown *aliunde*.

4014. Do you think it is important in every case of death under an anæsthetic that there should be a skilled inquiry? Do you think there is much to be learned from that?—That is a question I have really not considered.

4015. Perhaps I may ask you this one further question on that. Do you think, as regards the tribunal to examine into these deaths, that the coroner with a jury is the best tribunal, or would you prefer the coroner assisted by an expert medical assessor?—I should think the better of the two would be the coroner with the expert assessor, because the coroner naturally can hardly be expected to have a thorough knowledge of all those minutiæ, and the jury would generally have no knowledge whatever.

4016. You think an ordinary jury would not be likely to appreciate even the expert evidence?—I think not. I do not think that an ordinary jury would be likely to understand the differenee between shock and syncope or shock and asphyxia.

4017. A great many coroners, as you know, hold that as a matter of law, when deaths occurs under an anæsthetic used for operative purposes, they are bound to hold an inquest. Assuming that their view is correct, you do not think a jury is the best tribunal to get at the cause of death. You would prefer the coroner with an expert assessor?—Certainly.

4018. Would there be in the country generally a sufficient number available of sufficiently skilful assessors?—I should doubt it very much. I should think probably you would want one or two assessors who have studied the subject specially and could go from one place to another.

4019. There being about 150 deaths a year from anæsthetics, you think there ought to be something like a small panel of very skilled assessors?—I think that would be the best arrangement.

4020. In your opinion, representing an important medical view, do you think that if these skilled men were called as witnesses, that would do equally well; or do you think they ought to be in the more intimate position of assessors to aid the coroner?—I think it would be much better to have an assessor who had really studied the subject and was constantly at work upon it. I think we have somewhat the same in regard to cases of poisoning for instance; there are only a few men called upon to give expert evidence in case of poisoning, and it would be better that experts should be employed in cases of death from anæsthetics as well. Because after all if death is due to an anæsthetic, it is due to the action of a toxic agent.

4021. I suppose it is a difficult problem, when death occurs from anæsthesia, to determine whether there is any blame attaching to the administration or not. That is a further difficulty?—Yes, that is a point of the utmost difficulty. I do not think it can be solved by post-mortem examination.

4022. There you want the clinical evidence?—Yes.

4023. Now perhaps you will come back to your evidence. You were going to point out to us that in the case of all general respirable anæsthetics there are four stages?—Yes. The first is

the stimulant stage where all functions, bodily and mental, seem to be increased. This is best observed after a moderate dose of alcohol or a few whiffs of chloroform. Next comes the narcotic stage, when the relations of man to the external world are impaired. He is no longer completely conscious of what is going on, nor can he direct his movements with the same precision that he would when conscious. The third stage is the anæsthetic stage, when consciousness and voluntary motion are completely abolished and only the heart and respiration go on uninterruptedly. The last stage is the paralytic stage, when the respiration and circulation also become affected, the breathing stops, and the heart ceases to beat.

4024. Then I suppose when a man is coming out of the anæsthesia, the stages are reversed?—Yes, they are reversed, though very often when a man is coming out of what we term the narcotic stage, it is so very short as hardly to be noticeable. As a man is going under the anæsthetic he perhaps will struggle and cry, but in coming out he simply seems to come out without any struggling.

4025. Like awakening?—Like awakening. Very often they are drowsy and sleepy for a while after they come really out.

4026. And sometimes analgesia exists for a long time, after complete consciousness has been established?—Yes.

4027. You say that, subject to modification, these stages are characteristic of all general respirable anæsthetics?—Yes. In the case of some, like alcohol, the stages are prolonged, and a very large quantity of the substance is required to produce the paralytic stage. It is, therefore, very easy to stop the administration of the drug at any time, so as to prevent one stage passing on to the other. In the case of chloroform, on the contrary, the action is quickly produced, the stages succeed one another rapidly, and considerable caution is required to prevent one passing into the other.

4028. You have less margin?—You have less margin. Alcohol is, therefore, a much safer anæsthetic than chloroform, but it is so slow as to be inconvenient. Chloroform, on the other hand, is very rapid and very convenient, but its administration is not without a certain amount of risk.

4029. On that we have had evidence that chloroform in Scotland is very much more largely used than in England?—It is so.

4030. Is that due to the influence of the Simpson tradition?—Not entirely. This is only hearsay, and I cannot give any very definite evidence about it, but I have been told that ether had been introduced, and after being employed for a while was again given up on account of the secondary effects of ether, because ether is much more liable than chloroform to give rise to bronchitis and to a prolonged stage of vomiting; and these

secondary effects were so discouraging, that ether was given up and chloroform used.

4031. On the other hand, in America, where ether was first discovered, they stick largely to ether, do they not?—Yes, I think they still do, but how far it is due to the personal influence of the introducer I cannot say.

4032. In England we use various anæsthetics?—Yes.

4033. They come into vogue and go out again?—That is just it. Various anæsthetics, such as ether or a mixture of ether with chloroform, usually known as a.c.e., chloride of ethyl, &c., have been employed with the idea of finding one which was more convenient than alcohol and safer than chloroform.

4034. Are we likely ever to get an ideal anæsthetic, do you think, as chemistry improves?—It is quite possible.

4035. You think it is a long way off?—It is a long way off.

4036. Then you come to the question of the mode of action of these anæsthetics?—They all act—alcohol, ether, and chloroform—by affecting the nervous tissue directly, in all probability at least; but chloroform in addition to acting on the nerves, also acts on every other tissue of the body, and especially upon the heart. If applied to the skin, chloroform will blister it. If it be injected into the arteries of a limb, it will destroy the vitality of the muscles, and render them as hard as a piece of board. If a frog's heart be dipped into it, it will become rigid, like any other muscle.

4037. Then as a local anæsthetic it would be rather objectionable?—It is very objectionable. It is one of the painful anæsthetics. Then, as I mentioned before, if blown into the lungs by artificial respiration, chloroform may stop the heart; but if inhaled in the ordinary way the respiration fails first, and thus the inhalation of chloroform stops before enough has been taken in to stop the heart. But, whenever respiration ceases, the heart is bound to stop a little while afterwards, and if the cessation of respiration be caused in other ways than the mere administration of chloroform, the heart will also stop shortly after respiration.

4038. Is there anything known as to the mode in which these anæsthetics affect the nerve tissue?—They all seem to have a special tendency to combine with nerve tissue. This was shown in the case of alcohol many years ago. If you give an animal a large dose of brandy or spirit, and examine the brain afterwards, a good deal of alcohol may be got from the brain, more than from the same weight of any other tissue of the body. Practically it would seem as if the fatty bodies of which nervous tissue is largely composed have an affinity for alcohol, ether, and chloroform.

4039. Which are mostly of the carbo-hydrate series?—Much more specially the lecithine compounds. These seem to have a special affinity for alcohol.

4040. It directly poisons the nerves; it does not deprive the blood of oxygen, but poisons the nerves?—Yes, it poisons the nerves distinctly.

4041. Just as other poisons affect the spinal cord?—Yes, it would seem as if all those poisons had direct affinities for certain tissues. It is impossible to notice it with the great majority of poisons, but we can see it perfectly well with the different aniline dyes. There are certain aniline dyes which, when applied to any tissue, will pick out parts of that tissue and stain those, leaving others uncoloured, and it is through this particular property of aniline dyes that we have been able to stain bacilli of tubercle, and so on—the minute organisms which, but for staining, would not have been distinguished under the microscope.

4042. You think we may find some analogy in investigating the influence of alcohol on particular tissues of the body?—I feel sure that the analogy is a correct one.

4043. You say that respiration may be impeded in other ways?—Yes, by the tongue falling back so as to cover the opening of the windpipe, or by blood or saliva flowing into it when the patient is too deeply over to cough. A heavy weight, such as that of the arms of an assistant pressing on the thorax or abdomen, may prevent respiratory movements. I have seen the respiration impeded considerably by the thoughtless pressure of the arms of the assistant upon the body of the patient. Or a spasm of the glottis, due to blood, saliva, or regurgitated food, may cause the vocal cords to close and prevent the ingress of air. Spasm will not occur when the patient is thoroughly under, but will happen when he is partially under, and probably this is one of the reasons why imperfect anæsthesia is dangerous.

4044. All this points to the fact that, for surgical purposes, anæsthetics ought to be administered by skilled people, does it not?—I think so.

4045. I am not speaking of nitrous oxide, I was thinking of the longer anæsthetics?—Yes. Yet it is very curious that when I was a student, anæsthetics were invariably given by unskilled people. At that time, I speak of 1862 to 1866, there was no instruction in giving anæsthetics. My old teacher, Professor Symes, said: "We have never had any death from chloroform in Edinburgh, and the two reasons are that we always use the best chloroform and always give plenty of it."

4046. We had some evidence the other day from Professor Littlejohn, Professor of Forensic Medicine in Edinburgh University, who told us that he had investigated lately several deaths from chloroform. As knowledge has increased, apparently success has not increased?—Yes. It is curious that by giving the best chloroform you do not cause spasm of the glottis, because the best chloroform is free (at least if kept properly from light) from chlorine compounds which are irritating, and might

cause spasm of the glottis. Then by giving plenty of it, you avoid the risk of surgical shock. There are two ways of giving chloroform—one is to give it very gently, gently increasing the percentage of chloroform that is being inhaled; the other is the very opposite, just to cram a lot on the nose at once, and let the patient inspire. I have had both forms tried upon myself, and I certainly did not like the form of having the chloroform crammed over my nose. You feel as if you were going to be killed, and you struggle with the utmost endeavour to pull away the mask and get a breath of fresh air; whereas when it is given gently, you simply go under without any feeling of discomfort whatever. But, oddly enough, rabbits are easily killed by chloroform; they are particularly sensitive to it, and yet there are two ways in which you can give it which are with perfect safety, which are these two different kinds—by giving it very gently, or as they do at the Institute Pasteur, simply by taking a sponge filled with chloroform and cramming it over the rabbit's nose. The rabbit stops breathing entirely, and the heart stops.

4047. For a moment or two?—I should think probably for 10 seconds or more, and then it takes one deep inspiration and falls over, completely anæsthetised. That is a very rapid method. But it is when you mix the two methods that you get mischief. If you begin with a gentle effort, and then, when you have got the anæsthesia pretty well developed, you cram on the chloroform, you seem to get the damage done, though I cannot tell precisely how this occurs, whether it is through the respiration or the heart, but certainly you seem after the first deep inhalation or two to get death occurring. I think it is quite possible in this case that it is due to partial anæsthesia having made the person or animal more or less insensitive to the chloroform vapour, and that you may thus manage to get, as it were stealthily, into the lungs enough chloroform to paralyse the heart.

4048. Is it advisable, do you think, to use mechanical appliances for measuring the percentage of chloroform?—Theoretically it seems advisable, but I should doubt whether there is any practical advantage.

4049. You would rather trust to the eye of the skilled anæsthetist?—I think so. There is now, I believe, some method introduced by Professor Waller which shows the exact percentage of chloroform. I ought to have seen it, but I have not been able to get to see it.

4050. Idiosyncracy, of course, comes in very much?—Very much.

4051. An alcoholic subject or a heavy smoker will take it differently?—Yes, an alcoholic subject especially will take it badly.

4052. Or take it well; he will take a great deal without going under?—Yes, he will take so much that you really run the

risk of passing him into the paralytic stage before you get him thoroughly into anæsthesia.

4053. Then I suppose individual idiosyncracy comes in?—Very markedly, especially the nervous condition of a man.

4054. Does that enable him to take it more easily, or if a patient is very nervous and frightened of the treatment, does he take it more easily or is he more resistant?—I think a nervous person is very much more liable to shock.

4055. Does he require a big amount of chloroform before he goes under or a longer time?—That I cannot tell, but I think a nervous person is very much more likely to die. When a person is very much afraid of the anæsthetic, the mere fear may kill him, just in the same way as one knows that in India men die of snake bite, from snakes which are not poisonous.

4056. On the other hand a great many remedies have been very effective when a man has been bitten by a non-poisonous snake?—Yes.

4057. Also is the outside temperature of much importance as bearing on risk?—I think it is, but I have not been considering that for a length of time. I did some years ago work at the effect of temperature on chloroform as an anæsthetic, but it is so long ago that I have forgotten it.

4058. I think you told us on the Vivisection Commission that one result of administering anæsthetics to an animal was that the heat-regulating apparatus was put out of gear?—Yes, the instance that I then gave was that of chloral. When you give chloral to the extent of producing complete anæsthesia, the heat-regulating power of the animal is completely abolished.

4059. But you have not investigated the subject with reference to respirable anæsthetics?—No.

4060. Then the next point, I think, is that you are going to compare ether with chloroform. Ether is less dangerous than chloroform?—Yes, it seems to me that the difference between ether and chloroform in anæsthesia is very much like the difference between a blunt and a sharp knife in the surgeon's hand. Unless accurately guided, a sharp knife is the more dangerous and if it slipped would do more mischief than the blunt one, and yet the advantages which the sharp knife possesses when properly used are so great as to make surgeons invariably prefer it to a blunt one.

4061. Have you ever had ether yourself?—Yes.

4062. Pure ether?—Yes.

4063. The sensations in going under are very much more painful, are they not usually?—I did not distinguish much difference between the two in going under; but in coming out of ether there was a most disagreeable feeling of nausea discomfort and perhaps, shall I say, utter misery—a sort of indescribable misery which I did not experience after taking chloroform, and this condition lasted much longer.

4064. The patient struggles much more when taking ether? —So I think.

4065. Is that partly from idiosyncracy or would it be the general rule?—I think it is the general rule. But here also my very small experience of administration to man prevents my giving any very definite answer.

4066. Does a mixture of ether and chloroform mitigate the painful symptoms of ether?—I have never had it, and from my own experience I cannot speak. Judging from the fact that the mixture of a.c.e. was at one time very largely used and it now seems to have fallen into disuse, I suppose its advantages were not great.

4067. Now you are going to call our attention to nitrous oxide?—Yes, nitrous oxide is a very useful anæsthetic for short operations. The stimulant action of this gas, when only a few whiffs of it are taken, is so extraordinary that it is generally known under the name of "laughing gas," but when steadily pushed it produces complete anæsthesia. The disadvantage of it is that, owing to its preventing the proper oxidation of the blood, the patient becomes completely cyanosed and the anæsthesia can only be continued for a short time. By mixing oxygen with nitrous oxide, the anæsthesia may be kept up for a longer time.

4068. That is to say, up to nearly a minute?—I do not know how long, but I know for a longer time than nitrous oxide alone. If care be taken to allow the respiration to go on easily and completely during inhalation nitrous oxide is almost completely free from danger, but even, with it, it is to be remembered that shock is more liable to occur in an upright than a more or less recumbent position. I may also say that with nitrous ether as with anything else, if the respiration be embarrassed, there is a certain amount of risk. Some years ago, at the time when we were performing experiments on chloroform at Hyderabad, I think a lady died from nitrous ether. It was then found that the stays were so tightly laced that she could hardly breathe at all. We repeated the experiment upon monkeys, putting a bandage round the chest to correspond with stays, and we found that they died very much more rapidly, that it was an exceedingly dangerous thing to interfere with free respiration.

4068*a*. Then you say the position has some effect?—Yes, because when persons are standing upright they are much more liable to suffer from shock than when they are lying down.

4069. Is the tongue more liable to slip back in that position?—I do not think so. It is the shock; it is practically the difference between the flow of blood in a horizontal and in an upright position. For instance, if a man is going to faint, you put his head down and keep it down. The ordinary method

of preventing fainting that one has at the hospital is to ask the patient to put his head between his knees.

4070. Now you are going to deal with some other drugs which abolish pain but which are not usually classed as anæsthetics—opium, for instance?—Opium is more usually classed as a narcotic; in some rare cases it is a stimulant.

4071. Just like other anæsthetics?—Yes, but in large doses it is a narcotic disturbing the relationship between man and the external world, and then producing profound sleep with complete unconsciousness to pain; so that an animal entirely under its influence might be cut to pieces without making the slightest movement or indicating the least sensation. Morphia is a convenient anæsthetic for animals, but it is not convenient for man, because the quantity required to produce anæsthesia would also be sufficient to cause danger. The pain would be quite abolished, but the patient might never awaken from the state of unconsciousness. It is, however, a useful adjunct to ether or chloroform where the operation is to be very long, and especially in such cases as I have already mentioned of excision of the jaw, where the anæsthetic cannot be continued during the whole operation.

4072. That is a desperate operation, I suppose, to save life?—It is an awful operation, when there is cancer involving the jaw, but it is not only to save life but to save the man from most awful torture.

4073. It is a necessary operation, but only to be resorted to as a last hope?—Yes. In cases also where an anæsthetic cannot be administered, a subcutaneous injection of morphine may prevent much pain. For example, I was told by a German professor that when serving in the war of 1870, he was stationed beside the ambulance waggon which was to convey wounded men from the field to the hospital at the base, and as each wounded man was lifted into the waggon he received half a grain of morphine by subcutaneous injection; this quickly took effect and the wounded men, having been saved the excruciating pain they would otherwise have experienced in being carried to the hospital, arrived in a much better state for the amputation or other operation to be performed than they would have done without an anæsthetic.

4074. There is just one point I was going to ask you about nitrous oxide, to go back. How is it that when you administer oxygen with the nitrous oxide you do not, so to speak, make it into laughing gas?—That I cannot tell.

4075. If you mix ordinary air, which is oxygen and nitrogen, you get laughing gas?—Yes.

4076. If you administer pure oxygen without the inert nitrogen you get a useful anæsthetic?—I think it is because to the ordinary mixture with air the nitrous oxide is much more

diluted. One of the most curious points I know about it is this. If you take two or three whiffs of laughing gas, the pure nitrous oxide, and then throw it down just as it is beginning to take effect, the effect is continued. I was once lecturing on laughing gas as an anæsthetic, and after the lecture was over I went to a side room and I took two or three whiffs of it. I then began to feel a curious sensation in the fingers, a pricking sensation. I laid the mask down, but all at once, after I had ceased to inhale, I felt as if an electric shock had passed through my spine and I jumped up and, quite against my will, began to jump about, throwing my arms out in one direction and my legs in another. Then suddenly the whole effect passed off and I sat down again. But this was an entirely involuntary action on my part and began after the inhalation ceased. I have had laughing gas for a dental operation and there was none of this exciting action whatever when it was given in that way; I simply passed under without any excitement either in going under or coming out.

4077. You are going to tell us about some other drugs which are rather important as local anæsthetics?—Yes, perhaps I should say merely that the other anæsthetics I have mentioned —laughing gas, ether, chloroform, and morphine—probably prevent pain chiefly by deadening the sensorium in the brain. Other drugs prevent pain by acting either on the nerve fibrils at a point of injury or the spinal cord through which the painful impulse has to travel before it can reach the brain. There are a great number of drugs which have a more or less local anæsthetic action, but in many of them this is combined with an irritant effect which prevents their employment.

4078. I suppose carbolic acid is one?—Carbolic acid is a very efficient local anæsthetic.

4079. It is also escharotic?—Yes, so that you cannot employ it as a local anæsthetic except in cases of toothache, where, when applied to the cavity of the tooth, it acts as a very efficient local anæsthetic.

4080. Almost instantaneously?—Yes. The most important local anæsthetic is cocaine, and various modifications of this drug, such as eucaine, holocaine, novocain, stovaine, acoine, and orthoform. These are employed in solution by applying them to the part as in the case of operations on the eye, nose, throat, gums, or other parts where the solution can be easily applied, or by injecting them subcutaneously where an incision has been made as in the case of a boil or abscess, or into the gums for dental purposes.

4081. I suppose, when applied by simply painting them on, that can only be done in the case of the mucous membrane; it is no use painting them on uninjured skin?—No, it has no action at all.

4082. When injected subcutaneously how deep does the anæsthesia go; does it go any depth?—It does not go beyond

the point reached by the drug. I have had this also unfortunately tested upon me. In the case of a severe boil, when an injection was made of cocaine, the part to which the cocaine had been directly applied by injection was anæsthetised, but as soon as it passed beyond that point the tenderness was just as acute as ever.

4083. Does the cocaine infiltrate? If you only inject cocaine on to a definite spot, does it anæsthetise a certain space round?—Yes, a certain way round, but not much deeper. It extends a little way round the periphery, but it does not seem to extend deeper beyond the point at which the point of the subcutaneous syringe had penetrated. The action of the local anæsthetics has been found to be increased by mixing it with a solution of adrenalin, which contracts the blood vessels.

4084. That is quite a new discovery?—Yes, within the last few years.

4085. We heard a good deal about it on the Vivisection Commission?—Yes, local anæsthesia has also been produced by putting the positive electrode of a battery soaked in a solution of the cocaine on the part, and placing the negative electrode on some other part of the body. The connection then passes through the skin and subcutaneous tissue and produces local anæsthesia.

4086. Is that what is called ionization?—Yes.

4087. You can administer many drugs in that way?—Yes, a number.

4088. That is a comparatively new procedure, which has not yet come into common use?—No, it is just beginning to be used.

4089. But it may be very helpful in the future?—I think it very likely it will be. Another method which has lately come into vogue is to inject solutions of local anæsthetics into the spinal canal. These act locally upon the spinal cord and prevent the transmission of painful impressions made upon the nerves below the point of injection to the brain in much the same way as cutting a telegraph wire stops the transmission of messages by it.

4090. There are difficulties and dangers connected with that method, are there not?—Yes, certainly.

4091. There have been two deaths reported in England from the injection of stovaine?—I do not know the comparative mortality, but at present I believe it is rather higher than from general anæsthetics, although possibly, when we get more used to it and the technique is perfect, the mortality may be less.

4092. Are there not often troubles afterwards, spinal paralysis and certain brain trouble?—Those may be obviated, however, by more perfect technique. I do not think they are necessarily associated with it.

4093. One objection, I suppose, to local anæsthetics for operations will be this: that the patient will be conscious, and

fear of the operation will be operating upon him, although he will be free from the sense of pain?—So far as I know, patients do not seem to fear the operation much. In cases of operation on piles, for example, patients have told me that they felt nothing.

4094. But afterwards there have been ill effects from the administration of novocain or stovaine in a large number of cases?—I have not seen any cases myself.

4095. It is in Paris that they have been using it chiefly, is it not?—I believe so, but I do not know.

4096. But you have hopes that when the difficulties have been overcome it will be a new and powerful help to medicine?—I think it may, but I cannot express any definite opinion about it.

4097. It is only, I suppose, within the last two or three years that this spinal injection has been introduced?—It is four or five years, I think, now since they began.

4098. Can you tell us anything about your own hospital, St. Bartholomew's, as to the training the students get in the administration of anæsthetics?—I am afraid I cannot give any information about that; I believe they get a fairly good training.

4099. Then passing from that to the question of the proposed legislation, you have some opinions as regards that, I believe?—I think that to say that unqualified persons are to be absolutely prohibited from administering general anæsthetics for operative purposes is impracticable.

4100. General respirable anæsthetics?—Yes; because if that legislation were passed in that sweeping form, students could not give anæsthetics until after they had taken their degree.

4101. Surely under medical supervision, as long as they have got a qualified medical man present, it would not be excluded?—Does the Bill allow that?

4102. The proposed Bill seems to contemplate it as long as a qualified medical man is present. It is absolutely necessary in the country, say, where a man has his foot crushed by agricultural machinery and the nearest medical man must amputate it at once, and he would get anybody under his supervision to give a sponge of chloroform to the patient?—Yes, if it were under the immediate supervision of a medical man it might be done. I think that great care must be taken to secure that in cases where it is absolutely necessary for unqualified people to administer anæsthetics they should be allowed to do so, as in the instance you just gave of a man's foot being crushed by agricultural machinery in the country.

4103. I think the real question is whether putting aside nitrous oxide, to which different conditions apply, the longer

general anæsthetics, like chloroform or ether and that series, should be allowed to be administered except under the supervision or direction of a qualified medical man for the purpose of a surgical operation; what is your opinion upon that point?—I think not; because there ought to be no operator who is not qualified.

4104. Let me put one illustration to you—I do not know whether it is an apt one. Supposing that a bone-setter wanted to do a painful operation, do you think he ought to be allowed to administer a general anæsthetic? —No, I think not.

4105. Or a beauty doctor who wanted to do a painful operation for some beautifying process?—No, certainly not.

4106. You would support Dr. Hewitt's Bill up to that point?—I think it is advisable that anæsthetics should be given either by persons thoroughly qualified to do it or under the supervision of some one thoroughly qualified.

4107. But you would confine that at present to the longer general respirable anæsthetics?—Yes.

4108. Now take the case of nitrous oxide. Of course existing dentists have given it for years, and they must be allowed to go on giving it?—Yes.

4109. What do you think about future dentists who now have to go through a considerable medical training?—I think that future dentists ought certainly to get some sort of training in the use of anæsthetics, and that it should be made part of their curriculum.

4110. Under those conditions you would allow them to give nitrous oxide?—Yes.

4111. How about ether and chloroform—do you think that they require a qualified medical man to give them?—I think not. It seems to me that the administration of anæsthetics generally should be part of the ordinary curriculum of the dentist.

4112. You have told us that you must examine the patient and that the administration of an anæsthetic depends upon the general health and condition of the patient?—Yes.

4113. Do you think they would have sufficient training to enable them to do that?—I think so, quite easily, because a dentist, of course, is not at all like a man who does not know anything about anatomy and physiology, and I should think that the administration of anæsthetics might well be taught as part of their curriculum.

4114. And if it was taught as part of their curriculum, then they should not be prohibited from administering anæsthetics? —I think not; then, of course, a rule as to how much knowledge was required would be made part of their examination.

4115. We had some rather remarkable evidence last week from what I may call the unregistered dentists, a society who call themselves the Society of Extractors and Adaptors of Teeth.

There are about 1,000 members of this society, which has collected figures of the administration of anæsthetics by these unregistered people, and they informed us, I think, that their body had administered anæsthetics 1,249,167 times without an accident, or I think with one accident, in the case of ethyl chloride. Those are very remarkable figures? They are very remarkable figures.

4116. Have you any comment to make on them?—Statistics are proverbially treacherous; that is all I could say.

4117. What is your opinion on this practical point; do you think that a person who is not on the dental register and is not a medical man ought to be allowed to administer a general anæsthetic, either nitrous oxide or any other?—I think not.

4118. I rather gather that your opinion is confined to the administration of anæsthetics for the purpose of a surgical operation?—Yes.

4119. Take this case: you may administer an anæsthetic, I think you said, to a person suffering from an aneurism or any illness which causes very acute pain?—It is quite possible to administer an anæsthetic in the case of angina pectoris, gall stone, aneurism, or any severe neuralgia with, I think, no risk whatever when it is given in a certain way. It is a mode that I learnt from the late Mr. Image, of Bury St. Edmunds. A piece of blotting paper is put into the bottom of a tumbler; a few drops of chloroform are sprinkled on it, and then it is given to the patient, who holds the tumbler before his nose and inhales it. The moment the anæsthetic begins to act the hand falls; as the effect of the anæsthetic passes off and the pain comes on he again raises the tumbler. The only risks in that way of giving chloroform are first, if more chloroform should be put into the tumbler than the blotting paper can absorb. I once saw a nurse fill a tumbler one-third full of chloroform and hand it to a patient; but if the tumbler is always inverted first before giving it to the patient, there is no risk from that cause. The other risk is, if the patient should get hold of the bottle, and then he would spill it on his pillow and his head would go down on the pillow and he might be chloroformed to death. But when it is given in that way as I have described I do not think there in any risk.

4120. And you think that you must reserve the right to right to allow a nurse, or whoever is attending a patient, to give chloroform, not for the purpose of a surgical operation, but for diminishing pain.—Yes.

4121. And that is very important, is it not, in the case of a woman in childbirth?—Yes, for example, I know a country district where the doctor's beat is 25 miles in one diameter and it is absolutely impossible for such a man to be present at the whole confinement; and unless some provision is made for giving an anæsthetic to a woman in labour in some other way than by his own personal administration or under his immediate

supervision, the woman must go without the anæsthetic and suffer all the pains.

4122. So that you think Dr. Hewitt's Bill ought to be strictly confined to the administration of anæsthetics by inhalation for the purpose of some surgical procedure?—That is so; with that limitation, I think it would be all right.

4123. I suppose at St. Bartholomew's, for instance, when a doctor orders a patient an injection of morphia, it is the sister or the staff nurse who injects it?—I think at St. Bartholomew's it is generally the house physician; but I may say that very frequently I have had occasion, along with other doctors, to see patients who were suffering from intense pain, and we knew that the pain would continue for hours, and it was impossible for the doctors to come back again in time to give the second injection to relieve the pain, so that in such cases the hypodermic syringe has been left with the nurse ready charged and she is told, "Whenever the patient begins to suffer the pain again you give this injection." I think some provision of that sort must be carefully made.

4124. Sometimes, for instance, in the last stages of cancer it is necessary continually to administer injections of morphia?—Yes.

4125. And any legislation that interfered with that you would not approve of?—It would be most objectionable.

4126. Have you any opinion as to whether there ought or ought not to be any restriction on hypodermic injection, especially intraspinal injection, by unqualified persons?—Certainly; instraspinal injections should only be done by thoroughly qualified persons.

4127. At the present time they are very unlikely to be done by anybody else?—Yes.

4128. A hypodermic injection of cocaine sometimes results in accidents, does it not?—Yes.

4129. Would you confine that to qualified dentists and qualified medical men, or would you leave it outside the scope of the legislation?—It seems to me that to legislate for that might perhaps be a right thing, but it would be an awful interference with the liberty of the subject.

4130. You cannot prevent a man from giving himself a hypodermic injection, and you cannot punish a man for it as a criminal offence?—The Bill would include that, would it not?

Sir Horatio Shephard.—No, it is "to any other person."

4131. Chairman.—But still most harm is probably done by people who administer it to themselves?—Yes.

4132. Mr. Bramsdon.—I take it that you speak from having administered anæsthetics a great many times yourself?—Not to men; my experience, as I have tried to make quite clear, has been entirely from experiments upon animals.

4133. I did not gather that it was entirely; but you say so now?—Practically entirely.

4134. Still you have had considerable experience, have you not, in watching the administration of anæsthetics by others?—Not a very large experience; that is the province of the surgeon or of the anæsthetist; my practice is that of the physician; and the reason why I came to be particularly concerned in investigating the action of chloroform was from the physiological point of view, and from the point of view of a lecturer on pharmacology and therapeutics. As a lecturer to students on the mode of administering and the action of drugs, I was forced to investigate the action of drugs, and it was from that point of view that I took it up.

4135. You will not mind my asking this question: do you feel yourself thoroughly competent to express opinions upon the action of drugs and the administration of anæsthetics to human beings?—In so far as I have already guarded myself.

4136. But still I take it that you do feel able by the aid of your great experience in investigations?—Yes.

4137. Have you observed that last year and the year before, I think, there were a number of deaths in the London hospitals from anæsthetics?—Yes.

4138. Was that due in any way, do you think, to the fact that they were administered by unqualified persons?—That I cannot say, because I do not know.

4139. Your attention was directed to that fact?—Simply in a general way, not particularly.

4140. You did not go into the question at all?—No.

4141. In regard to the question of childbirth, I observe that the Bill would enable a person who is not a legally qualified medical practitioner to administer an anæsthetic if delay would endanger life?—Yes.

4142. Do you think that that would enable a nurse to administer an anæsthetic to a woman in childbirth?—I do not think so, because in many of those cases of labour, the labour would go on as it did before, before anæsthesia was ever introduced; only the woman would be suffering all the time.

4143. When a woman is in that condition, is she more tolerant of anæsthetics than any other person?—My belief is that she is, though I cannot tell you the exact reason why.

4144. With regard to dentists, do you think that if they were to administer nitrous oxide that would be sufficient for all practical dental purposes?—No, I know that it would not.

4145. What do you think ought to be permitted in addition?—I had an experience once of going to a dentist who gave me nitrous oxide and extracted, as I supposed, the tooth; but when I asked what had happened—I thought I should like to see the tooth—he said that the top had broken off and it was necessary

to extract the fang, and in order to do that he had to summon another man to give me ether.

4146. Then, I suppose, a medical practitioner was called in?—I cannot tell whether he was a medical practitioner or another qualified dentist.

4147. But in ordinary dental cases, nitrous oxide, I take it, is sufficient?—In ordinary cases.

4148. And in a complicated case would it not be advisable, if ether or chloroform were administered, to call in a medical man?—I should think, if provision were made for the proper teaching of the proper administration of anæsthetics to dentists, they might quite well, just as much as a medical practitioner, learn all that was necessary.

4149. But taking the present position of affairs with regard to dentists, do you think that they should be instructed with the administration of any other anæsthetic than nitrous oxide?—I think, upon the whole, it would be quite unnecessary to interfere with the present position of properly qualified dentists.

4150. You would give them *carte blanche* for the administration of all anæsthetics?—I think I should; if they had an accident, I suppose, perhaps more attention might be directed to it than if they were medical men.

4151. You know that a number of registered dentists have had no scientific experience and no teaching; they were simply men in practice prior to 1878?—That again introduces rather a curious question; that is, that it is since the teaching of the administration of anæsthetics has been introduced that the number of deaths under anæsthetics has risen so much.

4152. Is that due, do you think, to the increase in the number of administrations, or to any other cause?—That is just the point that I think ought to be discovered. I have been kindly provided with one of those diagrams of Dr. Hewitt's, and you will notice that there is a tremendous increase of late years; 1866 and 1867 was just the time when I was a student. At that time there was no instruction in the administration of anæsthetics, and you see the death rate is excessively low; then it rises very much, beginning with a great rise about 1887.

4153. Have you any idea as to the increase in the number of administrations during that period?—I think it must have been very great. A point that is worth investigation is how far this tremendous increase coincides with the very much greater number of major operations that are now performed throughout the country, because it was in 1877 that Lister came to London, and then it took a good number of years before the antiseptic surgery made its way. As soon as the antiseptic surgery was taught generally, men in the country performed major operations which before they never would have done. The number of major operations has increased tremendously in all the London

hospitals, so much so that the operating theatres have been quite inadequate of late to the requirements of the hospitals; and not only is that so, but all throughout the country men in general practice do operations now of a character that would only have been undertaken by very thoroughly trained surgeons when I was a student.

4154. Is it not also a fact that anæsthetics are administered in minor cases very much more largely than they used to be?—That I cannot tell; I do not know; it does not come within the scope of my knowledge.

4155. I take it that a patient who is about to undergo an operation has to be very carefully prepared before the anæsthetic is administered?—The chief thing is not to give them food for some time before, because if you give them food within a short time of the operation they are very likely to be sick just as the anæsthesia is passing off and to bring up their food, and then there is risk of choking.

4156. So that there is naturally a good deal of careful preparation required?—I do not know that I should call absence from food careful preparation.

4157. Perhaps I should not use the word "careful." A good deal of preparation is required; the patient has to be watched, and it must be seen that he or she is in a proper condition to have the anæsthetic administered?—Yes, care is certainly required about the feeding; but I do not know that there is anything else specially. The special care, of course, that is wanted before an operation is rather preparation in relation to antiseptics than preparation in relation to anæsthetics.

4158. Have you any personal experience of post-mortem examinations in the case of deaths under anæsthetics?—No.

4159. Chairman.—There is one question I want to ask apropos of Dr. Hewitt's diagram. There was a sudden rise of deaths in 1897?—Yes.

4160. I was wondering whether in 1897 any new class of operation came into existence, any fresh abdominal operations or anything of that kind?—I do not know.

4161. I take it that in the last few years an enormous number of operations are done as a matter of course which in old days hardly any surgeon would have dreamt of undertaking?—That is so.

4162. For instance, all this abdominal surgery?—That is quite new.

4163. That may account for a certain number of deaths through the necessary shock?—I do not know in what year Sir Frederic Treves pointed out that the removal of the appendix was so free from danger.

4164. When did Sir Spencer Wells' abdominal operations begin?—That was quite early; he was before 1870, I think.

4165. Then his operations soon began, I suppose, to be copied by others?—Yes, but I cannot give you any very definite opinion.

4166. But it is possible, I suppose, that the rise in the number of deaths may be due not to a more lethal effect of anæsthetics, but to the number of operations that are now undertaken?—I think it is probably due in the first place, to a greater number of administrations; and, secondly, to a different class of case, the very much greater number of major operations which are now done.

The witness withdrew.

MR. CHARLES S. TOMES, L.D.S., F.R.C.S., F.R.S., examined.

4167. CHAIRMAN.—You are a Fellow of the Royal Society, Fellow of the Royal College of Surgeons, and Licentiate in Dental Surgery?—Yes.

4168. And you are Crown Nominee upon the General Medical Council, and its senior treasurer?—Yes.

4169. How long a practice had you as a practising dentist?—About 29 years.

4170. You have retired now?—Yes.

4171. But you still do certain honorary work?—I do a certain amount of public work, on the Medical Council for instance.

4172. You, of course, have administered anæsthetics yourself very often?—I administered anæsthetics to a certain extent in the early days of my practice.

4173. But you have had them administered for your patients?—I have had them administered to a very large extent, and in the early days of nitrous oxide I assisted Sir John Burdon Sanderson, then the Professor of Physiology at University College, in his experiments. He was afterwards Regius Professor of Medicine at Oxford, but he was at that time Professor of Physiology at University College. I helped him in the early days of nitrous oxide with a number of experiments that we made on blood pressure and other effects on animals.

4174. So that you have considered not only the practical but the scientific side of anæsthetic administration?—Yes, but I do not feel competent to speak about the later investigations, and it is a good many years ago since I administered nitrous oxide.

4175. In your opinion the administration of anæsthetics calls for special knowledge?—Yes; it calls for special knowledge and training.

4176. Will you develop that a little?—I should say that the average medical man who has not received special instruction in administering anæsthetics is probably and usually a very

bad anæsthetist. He needs to understand the peculiarities of each of the bodies that is used as an anæsthetic, and to have had considerable experience in watching the gradual development of their effects.

4177. Let us take first nitrous oxide. That is by far the safest general anæsthetic?—That is by far the safest general anæsthetic.

4178. We had some rather extraordinary figures given us the other day, which perhaps you have not seen. They were given us by the Secretary of the Society of Extractors and Adaptors of Teeth, whom, I suppose, I might describe as unqualified dentists?—Yes; they are a body who have formed themselves practically for the purpose of getting behind the words of the Dentists Act and infringing its spirit.

4179. He informed us that he knew of one accident with ethyl chloride, but apart from that, the subscribers to that association had administered anæsthetics in 1,249,167 cases without any ill result?—That appears to me a very unlikely figure, because in the whole number of years that the Dental Hospital in London has gone on, speaking without book, my impression is that that is about the figure they have arrived at after an existence of some 40 years. And may I say one word about that case with ethyl chloride? That is an instructive case for the present purpose, because at the inquest on that case the most gross ignorance was displayed by the man who had administered it as to the doseage, its effects, what it was, and all about it.

4180. But we were told also as regards that one particular case that the gentleman in question had administered ethyl chloride something like 2,000 times without accident?—But if you refer to the evidence (I could have given you chapter and verse, only I came up at short notice) he displayed the most gross ignorance of its properties, doseage, and all about it. He knew nothing about it, in fact, judging from newspaper reports of the case.

4181. In your opinion, taking the ordinary registered dentist, do you think he ought to be allowed to administer nitrous oxide. As we know now, they all have a good medical training?—They have a partial medical training. It is a very difficult question. My own feeling leads me to just the conclusion I would rather not have to arrive at: that if it is to be a matter of legislative enactment and there is to be strict prohibition, I do not think they should be allowed to do so. It is perfectly true that they are medically trained up to a certain point—that they have seen a great deal of nitrous oxide administration, and that the fatal cases under nitrous oxide are few; but the emergencies, when they do arise, are such as to call for the very utmost resources of medical and surgical skill.

4182. But there we get into another difficulty. Take the case of a dentist in the country. Supposing that he was

compelled by law to call in a medical man, it is very unlikely that the medical man that he could get for the necessarily small fee would rise to such an emergency?—Perhaps not, but he may be supposed to be better equipped to meet it. For instance, I have myself seen at the Dental Hospital a case where tracheotomy had to be resorted to.

4183. Dr. Hewitt had a case in which tracheotomy had to be resorted to?—I am speaking of a different case. I am speaking of a case of Mr. Clover's, the anæsthetist, who is now dead. If you are going to say by statute that this person shall administer anæsthetics and this one shall not, it seems to me that you can hardly logically stop short of a full medical qualification.

4184. But with nitrous oxide are not the accidents so few and far between that you may practically eliminate them for legislative purposes?—They are very few.

4185. A certain number of people every year break their legs or necks from tumbling down stairs; but one could hardly legislate against people walking downstairs?—No, the amount of mortality from nitrous oxide is exceedingly small.

4186. If you take the total number of people who travel by rail and the total number of people who take nitrous oxide, would you not find that the fatalities are about in equal proportion?—I cannot answer that. I believe at the Dental Hospital there have been only two fatal cases.

4187. Two accidents in 40 years?—Two fatal accidents; but I have seen patients in a condition to cause the very greatest apprehension.

4188 At the Dental Hospital is the anæsthetic always administered by a medical man?—Yes, by anæsthetists appointed.

4189. By special anæsthetists?—Dr. Hewitt, for instance, was one, and Dr. Dudley Buxton another.

4190. That is, of course, preferable where it can be obtained; but London conditions do not exist everywhere, that is the difficulty; you have to deal with very poor people in the country districts. Must you not risk a little?—There a great difficulty comes in; but as to that I should like to say this. I do not think that whoever administers the anæsthetic, a medical man or a dentist or anybody else, should administer the anæsthetic and operate; and that necessitates the presence of another competent person. So that it does not seem to matter so much whether that other person is a medical man or a dentist so far as expense goes.

4191. Does not this sort of case often happen—a dentist has an assistant or partner, and that assistant or partner can perfectly well administer the anæsthetic while the other man operates?—Yes, and it is a very great convenience that he should.

4192. And that assistant or partner acquires very great skill in the administration of the anæsthetics by constant use; whereas the ordinary medical practitioner in a country town or village perhaps does not administer an anæsthetic once in two years?—And if he administers nitrous oxide he probably does not produce anæsthesia at all.

4193. He produces the phenomena of laughing gas?—Yes, but that, we hope, will be altered by instruction in anæsthetics being made a regular part of the medical curriculum.

4194. Do not you think it could be made part of the regular curriculum of future dentists. You could not interfere with the existing dentist; but as regards the future dentist, could not the administration of anæsthetics be made part of his normal training?—Yes, it could. The question is his capability on meeting with severe emergencies. For some reasons I should like to see a dentist allowed to administer nitrous oxide, but it seems to me logically that nothing short of a full medical qualification is quite adequate where issues of life and death may arise.

4195. Is there any authority which could prescribe a rule providing that when the dentist operates some other person must administer the anæsthetic?—There is none.

4196. The General Medical Council could not do it?—No, our powers are strictly limited by statute to dealing with certain matters.

4197. As a member of the General Medical Council may I ask you one side question: has not some instruction or recommendation been made by the Council with regard to the training of all medical students now in the administration of anæsthetics?—Yes, that was done rather more than two years ago, before there was any question of this Bill. A recommendation was sent to all licensing bodies, and the vast majority of them have adopted the recommendation and put it into force. There are a few that have not, but they are only delaying because of the peculiarities in their own statutes or ordinances. Some Scotch Universities cannot alter anything without a good deal of form and ceremony, but they are all in line as regards adopting it, and a very large majority have already done it.

4198. Will you kindly give us the exact terms of that recommendation?—The additional recommendations as to medical education of the General Medical Council (originally passed on November 29th, 1906, and communicated by circulation of the minutes) were again forwarded in a separate form to all of the licensing bodies on June 27th, 1907, and contained *inter alia* the words, "Every candidate for the final Professional Examination at the end of the fifth year should be required to give evidence that he has had sufficient opportunities of practical study, and in particular that he has received instruction in the

administration of anæsthetics." On December 7th, 1908, a circular letter was addressed to each of the licensing bodies inquiring how far they had given effect to the recommendations. The result up to the present is that, with the exception of three, all have made the requirement, or are taking steps to obtain the power to do so. From the three bodies no formal answer has been received as yet, but there is reason to suppose that they are disposed to adopt it.

4199. Does that recommendation in any way operate as a command; can it be enforced in any way?—By indirect process only. If they do not pay any attention to it, we can only report to the Privy Council, and the Privy Council, if they see fit, can suspend the registerability of the diploma issued by that body.

4200. It would cease to be a qualification?—It would cease to be a qualification.

4201. Practically they will all come into line soon?—They are all willing to come into line, and they mostly have come into line to-day.

4202. But the General Medical Council could not pass any regulation affecting, say, dentists administering anæsthetics and operating at the same time?—No.

4203. Once a man is qualified he is beyond the sphere of those regulations?—He is beyond our sphere of action unless he brings himself within it by committing acts of a kind which are disgraceful from a professional point of view.

4204. As, for instance, advertising?—Yes; for instance, advertising, or, in this particular connection, administering anæsthetics for an unqualified person.

4205. Do you mean that if a qualified dentist administered anæsthetics for an unqualified dentist, that would bring him within the scope of the General Medical Council?—A registered medical practitioner must not countenance, or to use a technical expression "cover," unqualified practice. But as the administration of anæsthetics by dentists has not been recognised, although it has not been interfered with, the resolution of the Medical Council speaks of "registered medical practitioners," and does not precisely touch the question asked.

4206. I take it that in spite of the general safety of nitrous oxide you have no hesitation in saying that an unqualified person ought not to be allowed for any operative purpose to administer general anæsthetics?—Certainly not.

4207. Even though he had had all the experience of this particular Society we had before us?—Yes, even if they have had that experience that they say. In the only case that we know of we are aware that one of their body showed the most complete ignorance of what he was about and of the agent he was using.

4208. That was in the case of death from ethyl chloride?—Yes.

4209. SIR HORATIO SHEPHARD.—The Nottingham case?—Yes.

4210. CHAIRMAN.—The next point, I think, is that the present Medical Acts are so worded as to be singularly inefficient in preventing unqualified persons from undertaking serious medical practice. What do you say on that point?—That as the Medical and the Dentists Acts are worded there is no prohibition in England of the act of practice. The only prohibition applies to the use of a title which implies that you are a qualified medical man. That was not so prior to 1858. The 1858 Bill as drafted and introduced forbade practice by unqualified persons, but it was emasculated in several Parliamentary Committees, and now the prohibition extends merely to the use of a title; so that the act of practice in England is not directly touched by the present Medical Acts, with the partial exception of the Apothecaries Act.

4211. An unqualified dentist cannot sue for fees for work done?—No.

4212. But he can sue for materials supplied?—Yes.

4213. And he can lawfully take a ready money payment?—Yes; or a man may practise medicine or surgery without let or hindrance, except that he does it at his own risk of being held guilty by a coroner's jury of manslaughter for having undertaken something that he is not competent to do.

4214. That must be on proof of the dentist showing negligence?—Yes, I suppose so. At all events for the mere act of practice he could not be punished in any way.

4215. You wish to see the Act strengthened, do you not?—I do.

4216. Do you think that much mischief is done by unqualified practitioners, both dental and medical?—Yes, perhaps especially in the Midlands and in the North. Ours is almost the only country that has such an inefficient Medical Act. Some of our Colonies have followed the wording of our Act, and they have also got inefficient Medical Acts, but a good many of our Colonies have broken away from it and made stronger Acts, and so have France, Italy, and more European countries, as well as most of the American States.

4217. I suppose you would only prohibit the practising of medicine or surgery for money.

4218. You could not prevent one man telling another to take some form of saline waters?—As long ago as the time of Henry VIII. it was recognised that you might out of Christian charity prescribe, but you must not do so for gain.

4219. May you operate for Christian charity, or do you confine Christian charity to mere prescribing?—I should not like to submit to an operation that was performed for Christian charity.

4220 The result is, is it not, that certain people have acquired very great skill, such as bonesetters, and they have often

done a great deal of good, though they may have done some harm?—A few, no doubt, may have done good, but on the whole bonesetters have done a great deal of harm. Now and again there may have been individual bonesetters who have really done a good deal more good than harm.

4221. Under foreign laws would they be prohibited from carrying on their occupation?—In many countries they would. In some countries, for instance, you must not only not practice, but your professing yourself to be ready and willing to practise is held to be an act of practise.

4222. Holding yourself out to practise?—Yes.

4223. At present, however, we are only concerned with a Bill dealing with anæsthetics. Would you say that qualified dentists should be authorised to administer any anæsthetic other than nitrous oxide?—Nitrous oxide may perhaps be put in a category by itself.

4224. You are inclined to answer the question in the negative logically?—Yes, I am inclined to answer it in the negative.

4225. But affirmatively, as a matter of convenience?—As a matter of convenience, I should not mind dentists being allowed to administer nitrous oxide, but not any of the more dangerous anæsthetics.

4226. Have you any opinion on this point as regards the use by dentists, first qualified and then unqualified, of local anæsthetics such as cocaine?—I think probably it would be inconvenient to attempt to deal with that by any enactment; it would be very difficult to draw the line where local anæsthetics begin. There have been some very dangerous cases, of course, with cocaine.

4227. I suppose there have been just as many dangerous cases with cocaine as with nitrous oxide, or even more?—I cannot answer the question as to comparative numbers. There have been one or two deaths. There was a death in Russia from a rectal injection of cocaine; but I am not aware of any deaths having happened from the administration of cocaine used for dental purposes.

4228. There was a case about a year and a half ago of a Russian unqualified dentist who used cocaine?—Yes. I was wrong. I remember that case perfectly well.

4229. Cases of death are rare, but dangerous conditions, you think, are not rare?—Not very rare.

4230. But you think that on general grounds legislation should not touch local anæsthetics?—I think it would be very difficult to legislate effectually on the subject.

4231. Even in the case of a hypodermic injection?—Yes.

4232. And nobody for dental purposes, or for any purpose, is likely to take to intraspinal injection?—Certainly not for

dental purposes, because the anæsthesia of intraspinal injection does not extend high enough up.

4233. Your teeth are not below your spine?—No.

4234. I suppose that unqualified practitioners generally are not at all likely to take to that mode of administering anæsthetics?—I should think it was exceedingly unlikely; it is difficult to do, and obviously has great risks unless it is done with great care.

4235. So that as a question of practical politics what one is dealing with is the administration of general respirable anæsthetics for operative purposes?—Yes, I think so.

4236. Is there any further information that you have to give us?—I think I have gone very nearly through what I had noted down, but there is this one point. If an anæsthetic which is capable of causing death is administered by a person who is not a fully qualified medical practitioner, he cannot give a death certificate.

4237. You do not wish that he should?—No, I should like to see that matter of certification very much tightened up.

4238. Do you think that a medical practitioner should certify the cause of death when he has not seen the body?—If he has a sufficient acquaintance with the case. If a medical man, for instance, knows that some one else has a severe aortic disease and is liable to sudden death and that man dies, I think he is perfectly justified in certifying to that effect, if the man has died suddenly under circumstances that are consistent with his known disease, though he may not have seen him for a fortnight or more, and has not seen the body.

The witness withdrew.

MR. MORTON ALFRED SMALE, M.R.C.S., L.D.S., examined.

4239. CHAIRMAN.—You are a member of the Royal College of Surgeons, and a licentiate in Dental Surgery?—Yes.

4240. You hold a double qualification, medical and dental?—Yes.

4241. And you have had some considerable dental practice?—Yes. I was for 20 years Dean of the Dental Hospital in London.

4242. That is the Dental Hospital in Leicester Square?—Yes, I was Dean there for 20 years, and I was for 16 years dentist at St. Mary's Hospital, Paddington.

4243. And also, as we know, you have had a large private practice?—Yes.

4244. And know that certain legislation is in the air?—Yes.

4245. And I believe you have formed an opinion as to what lines that legislation ought to take?—I have. My own feeling is that it is hardly desirable to legislate for one portion of

quackery—it all wants dealing with. The question has been referred from the General Medical Council, I think, for a Royal Commission to be formed, and it seemed to me that it would be better if the whole thing were put into the pot together.

4246. So that the question of the unqualified practitioner should be dealt with as a whole?—Yes.

4247. Not merely as regards dentistry, and not merely as regards anæsthetics, but the whole question of qualified and unqualified practice should be reconsidered *de novo?*—That is my idea.

4248. We as a Committee are asked by the Secretary of State to report especially on the question of deaths under anæsthetics; and incidentally we are considering the proposed Bill. Will you tell us first of all, whether you think that dentists ought to be prohibited from administering nitrous oxide?—Certainly not.

4249. In your opinion nitrous oxide is a very safe anæsthetic?—A very safe anæsthetic.

4250. And is the necessary skill in administering it very easily obtained?—Not so very easily. It is there for a man to obtain who wants to obtain it. For instance, they are giving it at the Royal Dental Hospital in 10,000 cases a year at least, and perhaps more.

4251. For the last 30 years?—Yes, I should say certainly at that hospital it has been given in half-a-million cases in the last 40 years without any death.

4252. Are you referring only to nitrous oxide, or to other anæsthetics?—I think other anæsthetics are given. Lately they have been giving chloride of ethyl a little. I suppose about 100 cases of nitrous oxide and chloride of ethyl combined have been given this year, and perhaps 3 or 4 cases of ether, but very seldom. Chloride of ethyl has only been given for a few years.

4253. As regards future dentists, do you think that the administration of anæsthetics ought to be made a branch of their training, and that they ought at any rate to be allowed, without a qualified medical man being present, to administer nitrous oxide?—Yes, I think so, certainly, but two qualified persons ought to be present.

4254. Will you give us your opinion as to the more enduring anæsthetics, ether, chloroform, and the mixtures of ether and chloroform?—I think there you are dealing with a much more difficult problem. I think the giving of chloroform, for instance, is a much more difficult process. The dental student has no opportunity, or a very small opportunity, of learning how to give that anæsthetic, because it is not given in English Dental hospitals. They give it pretty freely in Edinburgh, I believe.

4255. Do dental students give it?—In Edinburgh they do not seem to think anything of it. They would not hesitate about giving chloroform in dentistry, I think. But that is not so in the

South, and there is no opportunity for a dentist to learn at the Dental Hospital how to give chloroform. He would have to learn it in the surgical department of the General Hospital if he learnt it at all.

4256. Apart from learning how to administer it, before chloroform or ether is given you require a pretty careful medical examination of the patient, do you not, or at any rate a knowledgeable examination?—Yes, you want to be able to examine the man's heart and respiration.

4257. To be sure that there is not valvular disease of the heart, and that his respiratory organs are in good order?—Yes, but I think they give chloroform in these days without very much examination. If there is a severe operation to be performed, a man would have chloroform if necessary, without his state being examined into very carefully.

4258. To come to the practical point, do you think that legislation would be on right or on wrong lines, which prohibited future dentists from administering ether and chloroform?—I think it would be qnite right.

4259. You do not think it would inflict any hardship on the poor who may have to undergo a somewhat long operation?—I do not think so at all.

4260. They would either go to a dental hospital or a medical man would give his services?—Yes; but you can prolong nitrous oxide anæsthesia for two minutes, and can do all that you want to do in two minutes.

4261. Does no dental operation last more than two minutes?—Practically none.

4262. You mean two minutes on successive days perhaps, taking the operation in stages?—Yes; unless for some very urgent reason you would not clear a mouth of 25 teeth in one operation—it is a severe operation.

4263. The shock would be too great?—Yes, I do not think it would be desirable to do so, but by the administration of nitrous oxide through the nose you could certainly take three minutes if required.

4264. With safety?—Quite with safety.

4265. That amount of time in your opinion is sufficient for any ordinary dental operation?—Yes.

4266. Have you considered the question how far a dentist ought to be allowed to administer local anæsthetics by way of a hypodermic injection?—I do not think it ought to be allowed at all by an unqualified person.

4267. Are you referring to cocaine?—Yes, I think it is a most dangerous drug.

4268. Local anæsthetics are very commonly administered, are they not?—Yes, and there have been some very nasty results with them.

4269. Would you prohibit the use of cocaine?—I would prohibit hypodermic injections of cocaine.

4270. By a qualified medical man?—No, not by a qualified medical man. I should leave it to a qualified medical man to use it if he liked.

4271. But you would prohibit its administration by a registered dentist?—By a registered dentist, but not by a qualified dentist. I think that any man who has had a certain medical education, such as a dentist has had, should be permitted, if he thinks it desirable, to inject cocaine hypodermically. I think he is very unwise if he does.

4272. It is not a question, you think, for legislative prohibition?—I do not think it is.

4273. How about the unqualified dentist?—I do not think that any unqualified man ought to be allowed to inject a drug that cannot be restricted locally. If you inject it into the gum it is no longer a local anæsthetic, it is all over the system within ten minutes. It is the same as if you administered it intravenously. Practically it is the same as a hypodermic injection of morphia; there is no difference at all.

4274. Can you get a mucous surface like that?—When you inject it into the gum you inject it just the same, and it cannot be restricted in its action.

4275. If you inject it under the skin in your arm, as Sir Lauder Brunton was telling us just now from his own personal experience, the effects are localised, and you feel great pain as soon as the knife goes beyond the local spot?—Yes, that is quite true. I have injected it into myself many times. I had it given to me by an ophthalmic surgeon very early in the use of cocaine, and I have used it myself, and I have had a very unfortunate experience with it. I injected it into a personal friend, and he was unconscious in my chair for over an hour. I injected half a grain of cocaine. I made the solution at the moment I used it—it was not a standing solution—and injected it, and I thought he was going to die. I had to have recourse to artificial respiration, and I had a very anxious time for an hour; but he fortunately got better.

4276. Was that injecting it into the gum?—Yes.

4277. Did it act, do you think, by paralysing the throat, or by the general intoxicating effect?—I think it acted directly upon the heart.

4278. So that the injection of cocaine is a dangerous operation?—I think it is a very serious heart depressant, and you never know how it is going to act. There are many cases on record; I am not in a position to give you the number, but I am quite sure in my own mind that we could provide you with a number which would convince you that deaths from cocaine are very much more numerous than deaths from other anæsthetics.

4279. Sir Horatio Shephard.—On injection?—Yes; you may be able to get evidence on this point, but I am quite sure that there have been a great many deaths from the injection of cocaine.

4280. Chairman.—Another point on which you have a strong opinion is that no dentist or medical man should administer anæsthetics and at the same time operate?—I feel very strongly about that.

4281. In cases of emergency it may be absolutely necessary, but that would hardly arise in the case of a dentist?—No, and I think it is most dangerous. I believe that practically 11 out of the 13 cases of deaths recorded under nitrous oxide gas anæsthesia were due to the fact that the operator had no assistant and that he was doing the operation and administering the anæsthetic.

4282. From your own long personal experience you think that a man cannot efficiently watch the operation of the anæsthetic and do the necessary operation on the patient?—I could not do it.

4283. Coming to a rather different subject, I suppose you hold strongly that no man ought to give a general anæsthetic unless a third person is present?—Certainly under no circumstances. There ought always to be someone there for his own protection.

4284. Difficulties have arisen in those cases as we know?—There are many of them on record.

4285. There was one in the Midlands where a false charge was made in perfectly good faith, by a married woman against the dentist!—Yes, and I myself have known of a case within my personal experience.

4286. Mr. Bramsdon.—Do you think that for all practical dental purposes nitrous oxide is sufficient?—Yes.

4287. You do not think that dentists would be under any serious inconvenience or perhaps any inconvenience at all if they were restricted to the use of nitrous oxide in dentistry?—Personally I do not think they would, but other men might think so.

4288. I was only asking your own personal view?—I never use anything else myself and I do not have anything else used.

4289 That brings me to my next question: have you ever had occasion to want any other anæsthetic than nitrous oxide in your practice?—No; I have had other anæsthetics used at the patient's request. Patients, for instance, will request chloroform when they want their mouth cleared, and I have given way and had it administered, but not because I wanted it.

4290. Chairman.—Was it given then by a medical man?—I always have an anæsthetist, either Dr. Buxton or Dr. Hewitt. The last chloroform case was given by Dr. Hewitt.

4291. Mr. Bramsdon.—My point is, that in all cases,

whether any other anæsthetic has been given or not, you think that nitrous oxide would have been sufficient for the purpose?—I think quite, especially as it is given now with a nose piece. I think in two minutes you can practically do anything in extracting teeth.

4292. Is nitrous oxide very largely administered throughout the country, and the operation performed by one man?—Do you mean by a qualified man?

4293. Certainly?—I do not think it is very largely by qualified men; it is very largely by unqualified and non-registered men. I should say the majority probably of those gentlemen, the extractors and adaptors of teeth, do the two, because no doctor would dare to give it for them—he would be struck off the register if he did.

4294. But you think among registered dentists they invariably get a second person to administer nitrous oxide?—I should think nearly always, or that they have someone there. If they administer it, they have a doctor there. Doctors do not administer nitrous oxide very well, unless they have had some experience, and they have not had that until quite recently.

4295. It is a fact, I think, that dentists have considerable experience of the administration of nitrous oxide?—Yes.

4296. And the general medical practitioner has not?—That is so.

4297. So that you would prefer the administration of this anæsthetic by a dentist, rather than by an ordinary general practitioner?—Most certainly.

4298. CHAIRMAN.—On that may I ask, supposing any accident happened, would it be a useful thing to have a medical practitioner there who would know what to do in case of emergency?—Yes; in case of arrested breathing, or in case of heart stoppage, that is the advantage of having a doctor there.

4299. Having a skilled anæsthetist there?—Yes, he is looking after the patient while you are doing the operation—that is the point of it; and I do not think it is possible for any man to do the two. I could not possibly do an operation that required any skill in doing it, and also watch the patient's respiration and pulse, it is impossible. You will admit that the border line between death and life is a very narrow one, and if they have once gone over the border line, you cannot bring them back again.

4300. MR. BRAMSDON.—In the case of a general medical practitioner being present when nitrous oxide has to be administered and an extraction made, who generally would administer the nitrous oxide?—Do you mean a medical man who is not in the habit of administering it?

4301. Yes?—Probably the dentist.

4302. Then the docter would watch the patient?—Yes, he would watch the respiration and the pulse. I think, of course,

he is very valuable in that position, although personally, I would much rather have a doctor who was skilled at giving anæsthetics to give it, so that the dentist should have nothing to do but his operation. That is the ideal condition.

4303. But that is an expensive one, and you cannot always get it realised for the very poor?—No, you cannot now, but I think the future of nitrous oxide has to come. I believe very largely it will be the anæsthetic of the future—it is so safe an anæsthetic.

4304. You think that as time goes on, probably one will be able to lengthen out the administration?—Yes. I do not know whether you happen to have known Bailey, the anæsthetist, one of the best anæsthetists 20 years ago. Before he died he had administered gas for 40 minutes.

CHAIRMAN.—Dr. Hewitt told us that in the case of an animal, the administration had been kept up for 24 hours, I think.

4305. MR. BRAMSDON.—Do you know anything about the Society of Extractors and Adaptors of Teeth?—Yes, I know something about them.

4306. Have they some knowledge of the administration of this drug?—I do not see how they can have it.

4307. SIR HORATIO SHEPHERD.—By constant practice?—They have never had any hospital training—all that they have ever done is to be apprentices to a dentist, and to have worked in his workshop as mechanics.

4308. What about constant practice?—How do they get their constant practice? Only in their own practice.

4309. In their own apprenticeship?—They do not see the practice there; they are in the mechanical workroom. All dentists have down in the basement, or somewhere out of view, a workroom in which they deal with metals, vulcanite and so on, and make artificial teeth.

4310. MR. BRAMSDON.—Is it possible that these apprentices see the extractions, and also the administration of nitrous oxide?—I should say, certainly not.

4311. SIR HORATIO SHEPHARD.—But these people actually see the operations?—But they actually ought not to do so.

4312. It is not merely a question of mechanical operations done in the basement?—But the point I wish to make is that all their experience and all the education that they have had, they receive in the dentists' workroom—they have had no hospital career of any sort—they have never been inside a hospital either dental or medical as students.

4313. CHAIRMAN.—Some of them, I think, have had a certain hospital training, but failed to pass the examination?—Very few, I think.

4314. And some have had a long hospital training in America, but have been unable to qualify here?—

4315. Sir Horatio Shephard.—Or at some university that is not recognised?—If they cannot qualify there they must be very poor hands at their work.

4316. Chairman.—No, they have qualified there, but they could not qualify here and get on the register?—But the majority of these men are mere dental mechanics—they are just as much servants as a lawyer's clerk is to a lawyer—that is the position. You would not expect a lawyer's clerk to practise as a solicitor.

4317. Mr. Bramsdon.—But some of them get a very considerable legal knowledge?—Yes, they do.

4318. What I wanted to ascertain was whether you suggest that in many instances in connection with these men about whom we are talking, they go straight as it were into the room and administer anæsthetics without any previous experience?—I do certainly. I do not see how they are to have had any experience.

4319. You do not think it is probable that they go into the room with their principals and learn it in that way?—I should not think so.

4320. You do not know, I suppose?—No, I do not know.

4321. It is only what you surmise?—Yes, it is impossible to say that it is not so, but it seems to me that it is impossible that a man should have his mechanical pupil up to teach him to give anæsthetics, because he does not intend him to be a dentist.

4322. What does he intend him to be?—He wants him to be a tradesman—a mechanic.

4323. The same as he is himself?—Yes.

4324. Chairman.—What I rather understood when the Secretary of this Society came here was that an unqualified dentist who somehow or other has acquired great experience, has another unqualified person apprenticed to him, and for two or three years he trains him up doing practical work, though not of course going through a medical curriculum and not passing the general Medical Council's examination. In that way very considerable skill might be obtained, might it not, in the administration of anæsthetics?—It might, but I think it is most improbable. You mean that an unqualified practitioner teaches another?

4325. Takes an apprentice and teaches him?—Yes, that of course is possible, but certainly it does not seem to be a thing that should be recognised.

4326. Is it not a fact, and would not that account for the very successful way in which so many of these people apparently do administer anæsthetics?—Possibly.

4327. Mr. Bramsdon.—How long has the Dentists Act been in force?—The Act was passed in 1878. In 1859 the Royal College of Surgeons first granted its dental diploma as a voluntary diploma.

4328. What I wanted to know was this—nitrous oxide has been in existence for a greal number of years, I suppose?—Yes, I think for about 30 or 40 years.

4329. What was done with regard to general dentists prior to the Act of 1878 as to the administration of nitrous oxide—where did they get their experience?—The only place was the dental hospital.

4330. But the ordinary medical practitioner, I take it, used to administer nitrous oxide before the Act of 1878 came into operation, although he was not a licentiate in dental surgery?—The actual date when the first administration of nitrous oxide gas was given I cannot tell you.

4331. Let me try and put my question in another way. I want to find out in reference to these Extractors and Adaptors of Teeth, what was the method or manner in which dentists before the Act of 1878 used to acquire their knowlege of administering nitrous oxide?—They acquired it at dental hospitals.

4332. But many of them did not go to dental hospitals?—Then there were men giving anæsthetics, as there are now, such as Clover and Brain.

4333. Were not the circumstances prior to the Act of 1878 with a large number of dentists exactly what apply to the Extractors and Adaptors of Teeth now?—Not with regard to anæsthetics.

4334. Why not?—The thing is not of that length of time—it takes us 40 years back, does it not?

4335. I did not say 40 years—I said prior to the Act of 1878—that is 31 years?—Before I answer that question I should like to go home and find out exactly the date when nitrous oxide was first given at all.

4336. You said at least 40 years?—I should say about 40 years—I should think about 40 years—it may be only 30 years—it is quite a new anæsthetic. When I first went to the dental hospital as a student, there were only two men there who gave nitrous oxide at all—one was Clover and the other was Brain—and then it was all in the experimental stage. I actually saw with my own eyes nitrous oxide given with a face piece covering the mouth only, and a clip on the nose.

4337. With reference to the dentists who were registered as being in practice prior to 1878, how did they after that date get their experience in the administration of nitrous oxide?—Only from seeing it administered by invitation at the dental hospitals, and also by seeing it administered at demonstrations given at meetings of the British Dental Association—that is the way they learnt the general principles, and then for the rest of it they must have used it themselves.

4338. And you think that those dentists that were registered prior to 1878 availed themselves of those methods of ascertaining

the means of administering nitrous oxide?—They did certainly—not all of them, of course.

4339. Sir Horatio Shephard.—There is a danger with regard to nitrous oxide, is there not, in recovery from it sometimes?—Very seldom.

4340. We have heard of tracheotomy?—I believe there is one case on record and that is all. Dr. Hewitt performed it once.

4341. And it is with a view to that possibility that you would want a man present with a general medical qualification; —Yes.

The witness withdrew.

NOTE.

Mr. Morton Smale submitted the following Memorandum to supplement his evidence.

Memorandum by Mr. Morton Smale.

I consider that no unregistered practitioner is entitled to practise as a dentist or to teach others to evade the provisions of the Dentists Act, or that he is justified in administering anæsthetics.

The admission on to the register of the 2,000 (in practice before the passing of the Act) was not because they were fit to be admitted, but because the Legislature does not allow vested interests to be injured.

The solicitor's clerk, clever though he may be, is not permitted to practice as a lawyer. A dental mechanic, who corresponds in a dental practice to a lawyer's clerk in a solicitor's, ought not to be allowed to practise as a dentist. Before 1878 apprenticeship was the only method by which a pupil could learn his profession. The framers of the Dentists Act were fully aware how inadequate that education was, and an education at both a general and dental hospital extending over four years was prescribed by the Act as necessary for Registration.

If education, qualification and registration were made compulsory before a person could practise as a dentist, there would be plenty of qualified deutists to treat the poor just as there are plenty of doctors, but while the uneducated are permitted to evade the Act and to practise, the less desirable among young men are content to drift into that class rather than undertake the curriculum and examination that enables them to become registered.

The result of letting things drift will be that Great Britain's dental service will be demoralized and her reputation with regard to scientific dentistry be hindered. Many of these young men, if they were compelled to go to hospitals, would learn the enthusiasm for their profession that is found there, and instead of becoming merely adaptors of teeth, circumventing the Dentists Act, they would become honourable men practising honourably a profession to learn which they had devoted some years of their life.

Nearly all those who are now practising as so-called adaptors and extractors are quite young enough to have properly qualified themselves. Four years carefully supervised study can have no other result than to render the student more expert. Why not insist upon it? and see that it is not evaded by those wishing to be dentists.

It is much to be regretted that persons whose medical knowledge of the problems of life and death is infinitesimal should be allowed to produce anæsthesia, attendant as it is with certain dangers to heart respiration, and it is against my conscience to admit that those whose medical education is practically nil are capable of or justified in producing it. Many a case of malignant disease of the tongue or cheek has first been recognised in its early stages by the dentist, and the patient's life saved for years in consequence; this could not be done by those who have had no proper education or hospital experience.

Those who have had no scientific dental or medical education are not in a position to judge of its value; their assertion that the uneducated are as good dentists or doctors as those who have had a hospital career should be received with reserve.

If the Committee could see its way to advise the Home Secretary of the need of legislation prohibiting unregistered and unqualified practice of medicine and surgery and its specialities, it would confer a great benefit upon the public, which urgently needs such protection, as is shown in the December 5th, 1908, number of the *British Medical Journal*.

Such legislation should be restricted to a one-clause Bill without any definitions or qualifying words that would enable lawyers to find a method of evading it. The fact that such legislation would protect the profession can have no weight in the balance against the cruelty and rapacity of charlatans so well shown in the *British Medical Journal* to which I have before referred.

TWELFTH DAY.

Friday, 26th March, 1909.

PRESENT:

SIR MACKENZIE CHALMERS, K.C.B., C.S.I. (*Chairman*).
SIR MALCOLM MORRIS, K.C.V.O., F.R.C.S., Edin.
SIR HORATIO SHEPHARD, LL.D.
MR. WILLIAM H. WILLCOX, M.D.
MR. J. F. MOYLAN (*Secretary*).

MR. AUGUSTUS J. PEPPER, M.S., M.B., F.R.C.S., examined.

4342. CHAIRMAN.—You are a Master of Surgery of London, a Bachelor of Medicine, Fellow of the Royal College of Surgeons,

Surgeon to St. Mary's Hospital, Surgeon to the London Fever Hospital, and a Fellow of University College, London?—Yes. University College, as you know, is now incorporated with London University.

4343. And you are consulted by the Government in important criminal cases?—By the Home Office, by the Director of Public Prosecutions, and by the Commissioner of Police.

4344. Is that a formal appointment or informal?—It is all informal.

4345. Among other interesting cases where I think the Home Office suggested your help should be given, was the Druce case?—Yes. I may add that I have had very wide experience of making post-mortem examinations and giving evidence at inquests for more than 25 years.

4346. And you still, do you not, make post-mortem examinations in important cases yourself?—Yes.

4347. You are still, so to speak, in full practice?—Yes, I do not make them for coroners now, and have not done so for some years. I do for the police.

4348. At the request of the Home Office or the Director of Public Prosecutions?—Yes.

4349. More especially with reference to cases where criminal proceedings may ensue?—Yes.

4350. And you are also, of course, in practice yourself as a practising surgeon, as well as holding your Hospital appointments?—Yes.

. . . . . .

4582. CHAIRMAN.—Now we come to the question of anæsthetics. You know that at present some coroners hold that as a matter of law whenever a case of death under anæsthetics is reported to them, they are bound to hold an inquest; while other coroners, on the other hand, think they are bound to make inquiry, but not necessarily to hold an inquest?—Yes.

4583. What is your own view?—I am very strongly of opinion that an inquest should be held in every case.

4584. You agree that in case of death under an anæsthetic very complicated questions may arise?—Certainly.

4585. The death may be due to the anæsthetic?—Yes, wholly or partially.

4586. Or it may be wholly independent of the anæsthetic?—Yes.

4587. It may be due to shock or hemorrhage or to any other cause?—Yes.

4588. And supposing it to be due to the anæsthetic it may be due either to the anæsthetic *per se* or to defective administration?—Yes.

4589. Those are difficult and delicate inquiries, are they not?—Yes, and there are cases, of course, where death occurs sometimes a few days after the administration of the anæsthetic.

4590. You think that in all those cases an inquest should be held?—Certainly.

4591. Do you think that a coroner's jury are fit to determine those difficult and delicate questions?—I think so, with the aid of the medical evidence which is given and the direction from the coroner.

4592. You think it is better in that case that you should have the coroner and his jury rather than the coroner assisted by a medical expert?—I am a very great believer in the jury system. Everything comes out then; the question is considered by a greater number of people; and I believe the general public put great faith in the jury system.

4593. Do you think that faith is always well-founded?—In the majority of cases I think it is. I would not leave it to the decision of the coroner's jury except under the conditions under which the inquiry is carried on.

4594. You mean under the direction of the coroner?—Yes.

4595. Founded on expert evidence?—Yes.

4596. Take the case of a legal coroner who may be very well able to weigh evidence; do you think he ought to have a medical expert associated with him as assessor or not?—Either as assessor or that he should give evidence.

4597. In which capacity do you think that the coroner would get most assistance, from the expert as assessor, or from the expert as a witness?—I do not think there is much in it, because the coroner in those cases can and he does ask all manner of questions of the expert.

4598. But when there is, say, a considerable body of expert evidence, which may not always be in accord one with the other, and the coroner and the jury have to judge for themselves, do you think they are competent to weigh one expert against another?—I think they are competent practically to take a broad view of the case.

4599. As to whether anybody was to blame or not?—Yes.

4600. And you think, apart from that question, it is not very material?—I think not.

4601. You, of course, have operated a great deal?—Yes.

4602. Do you hold the opinion that nitrous oxide on the whole is a very safe anæsthetic?—Yes.

4603. What about accidents?—They are extremely rare, I think almost negligible.

4604. Practically negligible?—Yes.

4605. If one comes downstairs and trips, one may have an accident?—Yes. I am assuming, of course, that it is given by a qualified man.

4606. I am coming to that presently. You mean the risk of accident where nitrous oxide is given by a qualified man is practically negligible; it is like the ordinary risks of life, for

instance, a fall downstairs or an accident in a train?—Yes, but an unqualified man probably would not consider the question of removing a tooth plate, loosening the clothes properly, or inquiring whether the patient had just taken a hearty meal.

4607. When you say a qualified man, do you include dentists?—Yes.

4608. Registered dentists?—Yes.

4609. Do you include unqualified dentists?—I should absolutely forbid them to give any kind of anæsthetic whatever.

4610. I do not suppose you have seen the evidence that we had the other day given on behalf of the Society of Extractors and Adaptors of Teeth?—I should abolish them as regards anæsthetics.

4611. I asked whether you had seen the evidence?—No. I mean as regards anæsthetics. If a man likes to go to one of those men to have a tooth out, by all means let him do it on sufferance, that is, let him put up with the pain.

4612. I asked you at the moment whether you had seen the evidence?—No.

4613. The evidence given was this: that they had kept an account of the anæsthetics administered by their body, which number about 1,000, and that they had administered general respirable anæsthetics in 1,249,167 cases without an accident?—It is quite possible.

4614. That being so, is not any risk of accident a negligible one?—I do not think the risk is great, but I should say it would be greater where the anæsthetic is not giveu by a qualified man.

4615. Everybody would agree there. You have no guarantee in the case of the unqualified man whether he is skilful or not?—Of course you have not, and I have just given you instances where very likely an unqualified man would not think of things conducing to the patient's safety that a qualified medical man would think of.

4616. You think in the case of dental surgeons tnat they ought to be allowed to administer nitrous oxide?—Yes, I think so. I should be inclined to require that they should produce a certificate of proficiency in administering anæsthetics; there would be no difficulty in getting that.

4617. As a condition of being registered as a dentist under the Act of 1878?—Yes.

4618. With that safeguard you would be prepared to suggest no change in the existing law?—I think so. I say that for two reasons: firstly, because there are an enormous number of people who could not afford to pay for an anæsthetist, it would drive a good many to the hospitals; and secondly, it would also prevent a great number of people taking anæsthetics at all and add greatly to human suffering.

4619. Sir Malcolm Morris.—Is the administration of

nitrous oxide properly taught now; is it part of the curriculum at dental schools?—Yes, it is not compulsory, but there would be no difficulty in carrying it out. Every dental surgeon must have seen many hundreds of cases of administration; and when he is attending his course there would be no difficulty in having instruction from recognised anæsthetists, who would certify him.

4620. CHAIRMAN.—Have the General Medical Council power to require that before a man gets his L.D.S. qualification he should bring a certificate that he has acquired proficiency in the administration of nitrous oxide?—I do not know whether they have the power or not.

4621. But if dentists are to continue to have the power of administering nitrous oxide, you think it ought to be made a condition that every man in future before he gets his certificate to practise should have passed through an anæsthetic course?—Yes, and should have a certificate of proficiency.

4622. Now we come to other anæsthetics, ether and chloroform, and the like. In your opinion should a dentist be allowed to administer those anæsthetics, or should they always be administered by a duly qualified medical man?—I think they should always be administered by a duly qualified medical man.

4623. As involving a much longer period of anæsthesia?—Yes, or even where it is a shorter period, as in ethyl chloride, it is more dangerous than gas.

4624. And requires more medical knowledge in dealing with the emergencies that may arise?—Yes.

4625. I suppose dental operations, when they are likely to last a long time, do not require to be performed with great urgency?—No.

4626. Therefore it would always be possible to postpone an operation of some length until the services of a qualified medical man can be obtained?—Yes, in nearly all cases. There are very few emergencies in dental surgery.

4627. A man with violent toothache would wish to have the tooth out, and nitrous oxide enables it to be done?—Yes, I mean that apart from the patient's suffering you have not the emergencies that you have in general surgery.

4628. SIR MALCOLM MORRIS. If a dentist is also a qualified medical man that does not apply?—No.

4629. And there are many?—Yes.

4630. CHAIRMAN. There are many dentists who have the L.D.S. and M.R.C.S.?—Yes; then, of course, they come into the category of qnalified medical men.

4631. In your opinion, as a surgeon of long practice, do you draw any distinction between the safety of either and that of chloroform or mixtures of either and chloroform?—I think the potentialities for danger are much greater in the case of chloroform, but administered properly and carefully I think the danger is almost nil.

4632. As a surgeon, I suppose, for many purposes you would prefer chloroform to ether?—Yes. I never interfere with the anæsthetist ? I say, " You are the man at the wheel, you must choose which you like." If he says to me, " It is quite a matter of indifference whether I give ether or chloroform in this case, " I may say, " I would prefer chloroform."

4633. But the anæsthetist chooses?—Yes.

4634. Then you, of course, explain the nature of the operation and what you want in the way of production of immobility and muscular relaxation?—That is the main thing—immobility and muscular relaxation.

4635. Sir Malcolm Morris.—But the nature of one anæsthetic depends to some extent upon the nature of the operation?—Yes ; then the anæthetist knows what the operation is.

4636. Chairman.—You consult together?—Yes.

4637. For the sake of the life of the patient, the determination of the anæsthetic is left to the skilled anæsthetist?—If the patient happens to be unusually rigid, and it is, say, an abdominal operation, I wait until relaxation is established. The anæsthetist very often says, " Would you rather give him some chloroform ?" I say " No, don't consider me ; consider the safety of the patient."

4638. As regards ether, if chloroform has these advantages, do you regard ether as a very useful anæsthetic?—Certainly.

4639. For certain conditions?—I think, taking it altogether, ether is a safer anæsthetic than chloroform. There are certain cases, I think, where it is not desirable that it should be given.

4640. For the very old and the very young?—For the very old and the very young, and patients with any disease of the respiratory system.

4641. It tends to produce inflammation of the respiratory organs?—In any case of very profuse secretion of mucous or bronchitis, or dilitation of the right heart, the extra strain thrown upon the right heart or clogging the bronchial tubes may be tantamount to death.

4642. There are two kinds of ether in use, pure ether and methyl ether?—Yes.

4643. Is there any difference?—If pure, I do not think it matters much which is used.

4644. Methyl ether is rather more volatile?—Yes ; theoretically, I do not think it works out much in practice ; one would think it rather the safer of the two.

4645. Sir Malcolm Morris.—When a patient dies under an operation, an anæsthetic being given, and an inquest is held, do you think it necessary that the surgeon in charge of the case, as well as the anæsthetist, should give evidence?—I do undoubtedly. I do not think you can safeguard these cases too strongly.

4646. Dr. Willcox.—In reply to that question, by a surgeon in the hospital you mean the house surgeon?—Certainly, the house surgeon. It would be quite sufficient to explain the nature of the operation.

4647 Sir Malcolm Morris.—In the case of an out-patient?—Yes, not necessarily an operating surgeon.

4648. Chairman.—Have you yourself seen deaths under ether or chloroform?—I have seen, I think, only one death from ether. I have seen several from chloroform; I have witnessed them.

4649. Have you any opinion as to what was the cause of death in those cases—whether they were deaths under anæsthetics or deaths from anæsthetics?—In some of them I think death was mainly due to the condition of the patient.

4650. Which no care or skill could have avoided?—No, I am equally certain that, in some cases which I have seen, death could have been avoided.

4651. By a skilled anæsthetist using the proper means?—Say chloroform.

4652. Could you explain that a little more to us?—With a skilled anæsthetist, it is comparatively rare to see any struggling.

4653. In the initial stage?—Yes.

4654. Did these deaths take place, then, in the early stage while the chloroform was being administered?—The majority of cases that I have seen are where the patient has struggled a good deal, and then, when the struggle ceases, they take a few deep breaths and get in an overload of chloroform, and it is fatal.

4655. That danger does not apply to ether, of course?—No, not to anything like the extent it does with chloroform.

4656. You think, then, it is very important that medical men who may have to perform operations should all have a training in the administration of anæsthetics?—Yes.

4657. Do you think that in hospitals there ought to be one or more skilled anæsthetists on the staff?—Certainly.

4658. What is the practice, as regards your students at St. Mary's; does every student at St. Mary's have a training in anæsthetics?—I believe every one now. They have to have a certificate, I may say, that they have attended a course and received instruction.

4659. You have skilled men superintending the administration of anæsthetics?—Yes. I very rarely operate without there being some student with the anæsthetist receiving instruction. He is administering it.

4660. Under the supervision of the anæsthetist?—Yes, who is instructing him at the same time.

4661. I suppose, by long skill and practice as an anæsthetist, a man gets to know the meaning of what I may call almost imperceptible symptoms?—Yes.

4662. Which a man who is not used to administering anæsthetics would not notice?—Yes.

4663. Do you think students can be efficiently trained?—Quite.

4664. What use they may make of that training depends upon the individual student?—Yes.

4665. Do you think we shall have a less and less number of deaths, as every medical man is now receiving instruction in the giving of anæsthetics?—I believe they will be materially less.

4666. In cases in which you have seen death, was the anæsthetist a skilled anæsthetist or not?—Both—in the majority of cases unskilled, that is to say, unskilled as to experience.

4667. SIR HORATIO SHEPHARD.—Comparatively?—Yes.

4668. CHAIRMAN.—Do you mean qualified men?—Yes, but not professional anæsthetists.

4669. Taking the country generally, you cannot get a professional anæsthetist in every case?—No, and that is all the more reason why students should be specially trained in giving anæsthetics.

4670. Have you made a post-mortem yourself in the case of a death under anæsthetics?—Yes.

4671. What do those post-mortems show—typical symptoms?—No, I could not say there are any typical symptoms of death from chloroform. In the majority that I have made, there has been obviously some disease of the circulatory system.

4672. Which could not have been discovered before death, or might have been?—In some cases it might have been, and in others not. In the minority of cases there has been no disease discoverable in the circulatory system.

4673. Not even in the post-mortem?—I say in the majority of cases where I have made a post-mortem, there has been found disease in the circulatory system. In some of those cases the disease, I think, could have been diagnosed during life, and in others it could not have been.

4674. But if you had diagnosed the disease it might still have been necessary to do the operation and take the risk?—If it is justifiable to do a severe operation, it is justifiable to take the risk of anæsthetics.

4675. It by no means follows that, because a patient dies, even from the anæsthetic, anybody has been to blame?—Certainly not.

4676. SIR MALCOLM MORRIS.—Is there any system, so far as you know, of obtaining permission from the patient before an anæsthetic is administered?—No, it is not generally carried out. I think it usually follows on the question of an operation, to which the patient, or the legal guardian of the patient, consents.

4677. Would an anæsthetic be given to the young in hospitals without the permission of the parents?—Certainly. I

myself always make this rule: that I will not perform an operation on a young patient unless it is a matter of immediate urgency, a matter of life and death, unless I have permission to perform the operation.

4678. And that includes administering the anæsthetic?—That includes administering the anæsthetic. I look upon that as part of the operation.

4679. SIR HORATIO SHEPHARD.—It is so understood?—Yes.

4680. SIR MALCOLM MORRIS.—It is usually specified, is it not?—I do not think so. I should say that in the majority of cases special permission for anæsthetics is not sought.

4681. CHAIRMAN.—Surely everybody in this country knows now that a painful and serious operation is always performed under anæsthetics?—I think so. That is my practice, that neither the patient nor, as I say, the legal guardian of a patient under age is asked with regard to anæsthetics.

4682. Surely if a serious and painful operation were performed in a hospital without anæsthetics, and the patient died from shock and pain, everybody connected with it would deserve to be put on his trial for manslaughter?—I should say he would be blameworthy. What I was going to say, I think, is an important point: that it would be much more dangerous to life to perform a very severe operation without anæsthetics than with it.

4683. DR. WILLCOX.—You said that, in your opinion, it is desirable that there should be ordinarily anæsthetists at the general hospitals. Do you think it is desirable that there should be resident anæsthetists at the large general hospitals?—Certainly, because there are so many cases of emergency, where it makes all the difference whether the patient is operated upon in an hour or two; for example, perforation of the appendix, perforation of the stomach, rupture of the intestines from a blow, or rupture of the bladder.

4684. CHAIRMAN.—In those cases who would perform the operation? Would you ring up one of the surgeons?—Certainly.

4685. Then why not ring up the anæsthetist?—The surgeon is on duty during his day.

4686. But are you speaking of the house surgeon?—No, the operating surgeon—the visiting surgeon.

4687. Is not the anæsthetist who looks after that man's operations equally on duty?—At present he is only supposed to attend during certain hours of the day; he is not on continuous duty like the surgeon.

4688. SIR HORATIO SHEPHARD.—The surgeon is at call at any time?—Yes, and I have no doubt a great deal of suffering is saved, and many lives are saved by having a competent anæsthetist on the spot.

4689. CHAIRMAN.—You think that there ought to be in

every hospital that can afford it a resident anæsthetist, to be there at night as well as by day?—Yes, who can be called at a few minutes' notice.

4690. DR. WILLCOX.—You spoke of the post-mortem findings in a death from chloroform, and you said that in the majority of cases you find disease of the circulatory system, where there would have been no signs during life?—Yes.

4691. Were those cases of degeneration of the heart muscle?—Those were cases of disease of the coronatory arteries.

4692. CHAIRMAN.—Would that degeneration be visible to the naked eye, or would you have to stain in order to discover it?—In most cases, I think, it would be visible to the naked eye. They are cases of people who are not necessarily old. In old people you almost certainly will find that condition, but there are people who are prematurely aged as regards the circulatory system. A man may be, say, 45, and on a post-mortem examination you find that his heart and arteries are those of a man of 60.

4693. Is it expressed in the proverb "a man is as old as his arteries"?—Yes, it is so, but it is a fact, and a very important fact. It is a question not always of age, but of agedness.

4694. DR. WILLCOX.—In the case of post-mortem examinations after death from chloroform, do you consider it important that a microscopical examination should be made of the heart muscle as well as the naked eye examination?—Yes, I should say that a microscopical examination should be made in all cases where there is not naked eye evidence. Where there is naked eye evidence you do not require a more minute examination.

4695. CHAIRMAN.—If you see with your eyes that the muscle is degenerated, it is enough?—That is quite enough. Supposing you find nothing at all, if you had not known that the patient had died from chloroform, or under chloroform, and you find no disease of the circulatory system, the heart and vessels, I think it is important in those cases that a miscroscopical examination should be made; because there may be a dangerous condition from the state of the muscle of the heart without its being recognised by the naked eye.

4696. DR. WILLCOX.—In cases of death under chloroform in young people, is there a particular condition sometimes found which may be partly responsible for it?—There is a condition which is known as status lymphaticus, but it is not a very well determined condition. In most of those cases I think there is some obstruction to the breathing; that is likely to occur in a case of adenoids and enlarged tonsils, and occasionally enlarged thymus. I made a post-mortem on a case once where I found the thymus body as large as an orange in a child of about only six or seven years old. There, of course, obviously there was something pressing upon the blood vessels and respiratory tubes—a mechanical cause.

4697. In many of these cases is there not degeneration of the heart muscle?—My experience does not enable me to form an opinion. I have discussed the matter, not with regard to this inquiry, but long before it, with Dr. Hewitt, and I am inclined to agree with him that a little too much—I think he would say a good deal too much—is made of the status lymphaticus. Where a totally unexpected death occurs, say, in what is believed to be a healthy young person—I know of one case particularly in which it was not suspected that there was anything wrong, it is very easy to call it status lymphaticus.

4698. SIR MALCOLM MORRIS.—Is it possible under such circumstances that it is death from fright before the anæsthetic is administered—sudden panic?—I think that may have something to do with it, because sudden panic is a very powerful cardiac depressant, and if you add to that depressing influence an anæsthetic such as chloroform, I think that is a very important condition to be taken into consideration. You banish the panic by giving the anæsthetic, but you do not altogether banish the depressed condition of the heart which has been caused by the panic.

4699. CHAIRMAN.—Do you agree that as you push the anæsthetic, as the anæsthesia gets deeper, the probability is that the person will suffer less from surgical shock?—I should say that the shock from the anæsthetic when pushed is less than the shock that, especially if you were operating upon the internal organs—an abdominal operation—would be produced by such an operation with the patient not deeply under anæsthetics.

4700. Quite apart from any sensation of pain?—Yes. I am not thinking of pain; I am assuming that pain is abolished.

4701. But it is necessary, in order to prevent the full offect of surgical shock, to push the anæsthetic?—One has to do so frequently in a case of that kind, especially in the case of children, who very readily take it and appear to be quickly under the anæsthetic, where the corneal reflex is abolished, and perhaps you pull them about and they make no sign, but if you make an incision in the part they wake up a little; and it is by no means uncommon in that condition to find the pupil dilated a little and the pulse get weak.

4702. That means shock?—Yes.

4703. But not necessarily conscious pain?—No.

4704. They are in a stage of analgesia?—There is danger of shock from the operation.

4705. SIR MALCOLM MORRIS.—But you get the same sort of phenomena, quite apart from any question of shock, according to the excitability of particular parts of the skin?—Yes.

4706. An incision made in the margin of the anus will produce that sort of symptom?—Yes; to give the most typical instance, circumcision of a baby.

4707. CHAIRMAN.—Will you please explain that?—A baby very rapidly goes under an anæsthetic, say chloroform.

4708. Are babies anæsthetised before circumcision?—Yes.

4709. In hospital circumcisions?—And private circumcisions, too. I do not think parents would let you do it without.

4710. SIR MALCOLM MORRIS.—Except as a rite?—Yes.

4711. CHAIRMAN.—Amongst the Jews?—Yes; but very largely now amongst the Jews it is done by medical men under the ordinary conditions. I have done many on babies. An anæsthetic is given, and they go under very rapidly indeed. They appear to be deeply under; but the moment you make an incision they begin to struggle, and then you certainly may have some shock.

4712. Symptoms of shock?—Certainly.

4713. So that in the case of an operation you are always between two fires. As you abolish shock you increase the depth and the danger of the anæsthesia?—Yes.

4714. That cannot be avoided in any way?—No; you endeavour to strike a happy medium.

4715. There is one other point that I see you raise. You think that poisonous local anæsthetics like cocaine ought not to be administered by unqualified persons?—Certainly.

4716. Would it not be rather difficult to deal with that in an Act of Parliament, to differentiate where a local anæsthetic may be used and where it may not, by unqualified persons?—I think that would be met by specifying the local anæsthetic.

4717. Would you specify the mode of administration?—I do not think so. It would be desirable to specially mention a hypodermic administration, because the action is so quick, and you have no control whatever over the cocaine when once it is injected hypodermically. If it is injected into the rectum, for instance, or taken into the stomach, you may get rid of some of it while the patient is still there.

4718. Supposing a man gets a filing or a tiny bit of cinder into his eye, you would not prevent him from going into a chemist's shop and saying: "Please drop a drop of cocaine into my eye"?—I think not. I do not think under those circumstances it is likely to be dangerous. I think I would confine the prohibition to a hypodermic injection.

4719. Or, of course, an intra-spinal injection?—Yes.

4720. In those cases, would you prohibit anybody but a qualified medical man or qualified dentist from using it?—I would forbid his giving the anæsthetic by the stomach or the bowel or by a hypodermic injection; but by a little superficial application, such as you mentioned, to the conjunctiva, or some little sore place on the skin, I do not think the patient could absorb sufficient to be dangerous.

4721. Supposing a man had bad toothache and he goes to a

chemist and says: "Give me a tiny bottle of camphorated chloroform," and he rubs it on himself, you would not prohibit that?—No.

4722. The difficulty is, when you use general words in an Act of Parliament to exclude the cases you do not wish to interfere with, and to include those that you do?—I am thinking more particularly of cocaine, with which it is well known that accidents happen. In one recent case it is pretty well certain that cocaine was the chief cause of death.

4723. But those cases are very rare?—Cases of death, yes; but I do not think it is by any means uncommon to get symptoms of cocaine poisoning from an injection. I have seen it myself in my patients when I injected it subcutaneously; it is a very dangerous drug.

4724. SIR MALCOLM MORRIS.—You include its allies, of course, like eucain, stovain, and so on?—Yes.

4725. DR. WILLCOX.—There is considerable danger, too, in urethral injection?—Yes, I know of one case which happened not long since, when it was injected into the urethra, and death ensued.

The witness withdrew.

MR. BERNARD HENRY SPILSBURY, M.B., examined.

5821. CHAIRMAN.—You are pathological lecturer and pathologist at St. Mary's Hospital?—Yes.

5822. Do you hold any other offices?—I am a curator of the Pathological Museum there.

5823. You wish to give evidence with regard to cases in which the evidence of pathologists should be taken before the coroner?—Yes.

5824. There are two classes of cases that you refer to specially?—Yes.

5825. To begin with, cases of death under anæsthetics?—Yes.

5826. Is it your view that in those cases special pathological evidence should be required?—I think it would be preferable, certainly.

5827. Does that mean in all cases in which a patient has died when under an anæsthetic, to whatever the death may be due?—Yes, while under the influence of the anæsthetic.

. . . . . .

5874. Do you consider chloroform one of the most powerful depressants of the heart amongst anæsthetics?—I think it is the most powerful depressant.

5875. Can the condition of status lymphaticus be recognised during life?—My own impressions is that in a large

majority of these cases it cannot be recognised with certainty, but it may be suspected.

5876. Would it be a very careful examination which would give one suspicions of it?—Yes, I think that is so.

5877. Such as——?—Enlargement of the spleen and the thymus glands.

5878. Which could be detected by very careful physical examination?—Yes.

5879. You have, I believe, made several investigations into deaths under anæsthetics which have occured in other hospitals than your own?—I have.

5880. In order that the person who made the post-mortem should have no bias in favour of the particular hospital?—Yes.

5881. Has it been your experience that the post-mortem examination has in many cases entirely removed any possible charge of carelessness which might have rested on the anæsthetist?—Yes; I think that in the majority of cases that certainly has been the result.

5882. And from that point of view you consider it most desirable that a post-mortem examination should be made in all cases of deaths under anæsthetics?—For the sake of the anæsthetist only, it is an important circumstance.

5883. In all cases of deaths under anæsthetics, you consider it desirable that an inquest should be held?—Yes, I do.

. . . . . .

5893. Are there any general post-mortem appearances in the organs in the case of deaths from anæsthetics?—In a certain proportion of cases we meet with the condition of status lymphaticus, in which the appearances are very characteristic.

5894. Would you mind telling me what those appearances are?—They consist in a persistence and enlargement of the thymus gland, in enlargement of the spleen and of certain sets of lymphatic glands, and I think in all cases also fatty degeneration of the heart muscle.

5895. And in other cases are there general appearances?—In other cases in which I have made an examination, in which the death has been influenced by chloroform, I have always found fatty degeneration of the heart from other diseases.

5896. Not caused by the anæsthetic?—Not caused by the anæsthetic, as the result of previous long-standing disease.

5897. But I mean what has been the action of the anæsthetic that has produced the particular appearances noticed?—I do not think there is any reliable appearance.

5898. You get suffocation, I suppose?—No, not always suffocation. I think syncope is more often the cause of death in those cases.

5899. Is that the result of depressants on the heart?—I think it is.

5900. Pure and simple?—Pure and simple, I think.

5901. Do the different anæsthetics produce different symptoms?—You are speaking now of general anæsthetics.

5902. Yes?—They produce a difference in intensity of the symptoms, but not, I think, a difference in the kind of symptoms.

5903. It is purely a question of degree?—I think it is.

5904. Do you get the same post-mortem appearances after death from chloroform as after a death from ether?—Yes.

5905. What about local anæsthetics?—There are few local anæsthetics that I think have any danger at all.

5906. Say cocaine?—That is one in point. There the cause of death may be either syncopal or asphyxial, it varies in different cases.

5907. It may be either?—It may be either.

5908. Can you give any explanation of that?—In some cases a subject who is under the influence of cocaine may be seized with epileptic attacks, and he may die during one of those attacks from failure of respiration, from asphyxia, as the result of rigidity produced by the epileptic form of attack. On the other hand, he may die after the mere epileptic seizures have ceased, and then the death is more likely to be syncopal than asphyxial.

. . . . . .

5924. With regard to the mode of death from anæsthetics, in your experience syncope has been a frequent cause of death?—A general cause of death.

5925. More frequent than asphyxia?—I think so.

5926. And in some cases is it your view that an asphyxial attack may induce syncope?—That is so.

5927. So that the cause of death may be really a combination of syncope and asphyxia?—Yes, in some cases I think it may.

The witness withdrew.

TWENTY-THIRD DAY.

Thursday, 15th July, 1909.

PRESENT:

SIR MACKENZIE CHALMERS, K.C.B., C.S.I. (*Chairman*).
SIR MALCOLM MORRIS, K.C.V.O., F.R.C.S.
SIR HORATIO SHEPHARD, LL.D.
MR. WILLIAM H. WILLCOX, M.D.
MR. J. F. MOYLAN (*Secretary*).

SIR VICTOR HORSLEY, F.R.S., F.R.C.S., examined.

8843. CHAIRMAN.—You are a Fellow of the Royal College of Surgeons and a Fellow of the Royal Society?—Yes.

8844. And you hold the post of surgeon to certain hospitals?

—The National Hospital for the Paralysed in Queen Square, and I am consulting surgeon to the University College Hospital.

8845. I suppose we may take it that you have done more important brain operations than any man alive?—I have done a good many.

. . . . . .

9647. Sir Malcolm Morris.—In your long operations do you use chloroform much more than ether?—I practically now never use ether, because ether has several disadvantages: that it produces irritation of the respiratory passages and chloroform does not; but my chief reason for using chloroform is that it is much more agreeable to the patient afterwards.

9648. Chairman.—And at the time of administration?—Yes.

9649. Dr. Willcox.—You are not a physician, but I think you can tell us this. In those cases of fatty degeneration of the heart muscle with normal valves, that condition is practically unrecognisable during life?—Yes.

9650. So that it is only after the accident has happened that you find out the cause of it?—Yes.

9651. Do the appearances show that on the post-mortem?—No.

9652. So that you really require a very skilled pathologist to detect it?—Yes; now it requires an extremely skilled pathologist, because the little band of muscle which communicates the rhythmical impression from one part of the heart to the other is extremely small, and an ordinary pathologist would not detect any changes in it at all.

9653. Are those changes visible to the naked eye?—Very often they are not.

9654. Does it require staining?—They require microscopical examination.

9655. Microscopical examination and staining?—Yes.

9656. Sir Thomas Bramsdon.—Are there no post-mortem appearances at all in the case of death under anæsthetics?—No.

9657. Chairman.—It depends upon the cause of death, does it not; there may be asphyxial conditions?—There again these asphyxial conditions disappear by the time the post-mortem is made.

9658. Sir Thomas Bramsdon.—*Quâ* anæsthetics there are no particular post-mortem appearances?—No.

9659. Dr. Willcox.—Only signs of asphyxia?—And they will have disappeared. Besides, very often they are very slightly marked.

9660. Chairman. Before we go on to the question of who may administer anæsthetics, I should like to ask you one or two more questions. Do you think that the anæsthetic ought to be chosen by the surgeon or by the anæsthetist?—By the surgeon.

That question has been discussed I am sure in medical meetings, and I feel convinced that the general conclusion was that it is the surgeon who is responsible for the operation, and therefore primarily the question of the anæsthetic ought to be settled by him ; but undoubtedly the anæsthetist would be perfectly within his right in protesting, if on his examination of the patient he found certain conditions existing which he thought militated against that particular anæsthetic which the surgeon wished for.

9661. In your own experience you have come to the conclusion that chloroform is the best anæsthetic, and that it is as safe as any other if the dosage can be regulated ?—Yes.

9662. Is that taught in medical schools ?—Yes ; but it is not taught in all.

9663. Can you tell us what steps the General Medical Council have taken to enforce the teaching of anæsthetics to students before they are qualified ?—When I was a member of the Council I brought forward the subject and endeavoured to carry a resolution that it should be a compulsory part of the curriculum. I lost that.

9664. That is some years ago ?—Yes, and I have been off the Council now for four years, so that I do not know the actual present position ; but I am still absolutely of opinion that it would be perfectly possible to make it part of the compulsory curriculum.

9665. Dr. Willcox.—Are you aware that most of the London Medical Schools insist on a student presenting to the Dean a certificate that he has undergone an adequate course in anæsthetic instruction before he is allowed to go up for his Final Examination ?—I did not know that it was accepted by all the schools. I believe that University College was the first school at which a systematic instruction of the house officers in giving anæsthetics was a condition of their appointment, but I did not know that it was now adopted generally.

9666. In several schools that is so. You think it is a desirable system ?—I think it is essential, and I cannot see any reason why the qualifying body should not carry out the examination in the ordinary way.

9667. Chairman.—This question of anæsthetics is a very important question, and it is a question which has more or less been referred to us against our will. What do you think would be an adequate training for the ordinary student ? He ought to have theoretical instruction ; and what practical instruction ought he to have ? I should like to know what you advocate on both these points ; what would be the standard that you would set up ? —In the first place, as I stated to the Royal Commission on Vivisection, I think that all students ought to be taught to give anæsthetics on animals first. I do not think that any student ought to gain his first experience by anæsthetising human beings.

9668. Not even under supervision?—Certainly not. He ought to learn by giving anæsthetics to animals first. Then when he comes to the hospital side of his work he ought to receive, as he does receive certainly at University College Hospital from Dr. Buxton, theoretical lectures on the subject and practical instruction in the Anæsthesia Room at the hospital. I think that the instruction given there is quite adequate, barring that the man has not, under present regulations, had the previous experience of anæsthetising a living thing.

9669. A living thing under circumstances which try his nerves?—Exactly, and whose death does not matter—that is the point. There is no moral responsibility if you give too much chloroform to a cat.

9670. You mean that men are turned out into the profession who have not had a sufficient experience and who are appalled by the consequences of what they are doing and thereby lose their nerve?—I think that the public suffer more from anæsthetics being given imperfectly; from a patient having so much as to make him very uncomfortable after the operation, or having so little as to make the operation more difficult.

9671. In hospitals, of course, a skilled anæsthetist ought always to be present?—Yes.

9672. You would never let a student, I understand, give anæsthetics?—Yes, I would allow him to give anæsthetics if he has had a preliminary training by giving them to animals. I would allow him to do it then under the direction of an expert anæsthetist.

9673. Surely any student who has got up to his third or fourth year can give anæsthetics directly under the anæsthetist's eye with safety?—Yes, I should say with safety to the individual. I do not think that individuals thus anæsthetised run any appreciable risk. What I meant was that unless some one has the primary responsibility of watching the respiration, and so forth, and appreciating the variations in respiration—unless he has gone through that preliminary training he would not appreciate it when he came to do it in a hospital.

9674. You think that the whole theory of anæsthetics ought to be taught to every student?—Yes.

9675. For instance, the danger of the tongue falling back, and the danger of anæsthetics after food?—Yes, all those things are taught very fully. And allow me to point out that I think they ought to be taught, not only to every person who is going to be registered on the Medical Register, but to every person who is going to be registered on the Dentists' Register.

9676. Now we come to another point: Who really ought to be allowed to administer anæsthetics?—I think a registered medical practitioner, or a registered dentist.

9677. Would you allow a registered dentist to administer

any other anæsthetic than nitrous oxide?—Yes; I think that the qualification of L.D.S. is quite enough, provided the man has had the training that I speak of. In that matter I do not agree with Dr. Hewitt.

9678. Would you permit the same person to administer the anæsthetic and to perform the operation?—I do not think it is possible to prevent it by statute; but so far as possible it ought to be prevented.

9679. It is possible to prevent it in the case of dentists, because their operations are never very urgent?—I do not think it is possible in the case of dentists in the country; the dentists in the country often have to give gas and then extract.

9680. I was thinking of the more lasting anæsthetics—chloroform and ether?—I do not think they should ever be given without a second person being present. I was thinking of gas. It is a question of expense, you know, to the public. The ordinary patient of a dentist could not bear the expense of having an expert, as it were, to give the anæsthetic; but a dentist gives gas which costs 5d. or 6d., and then quickly extracts a tooth without much risk to the patient.

9681. In your opinion nitrous oxide is a very safe anæsthetic?—Yes.

9682. Especially when given with oxygen?—Yes.

9683. Referring to some evidence which was given before the Vivisection Commission, it is a fact, is it not, that the danger of chloroform can be mitigated by giving certain drugs to the patient?—Yes, we used to give morphia, of course, but those drugs have certain disadvantages.

9684. I am thinking more of heart stimulants such as atropin?—Yes, atropin again is given; but you may overdo it. In a case that I operated upon a short time ago, the heart suddenly began to run away in the middle of the operation, and we had to stop the operarion. I found out afterwards that the patient had had a dose of atropin given him by the anæsthetist, and it was entirely due to that. The patient, I may say, made an excellent recovery from the operation.

9685. Dr. Willcox.—Do you know how much was given?—I am not sure whether it was a $\frac{1}{100}$th or a $\frac{2}{200}$th, that is to say, a one-fiftieth. The simpler the anæsthetic the better. I do not give any drug now of any kind.

9686. Chairman.—You simply confine your attention to the dosage?—Exactly.

9687. Sir Malcolm Morris.—Which do you consider responsible, the surgeon who operates or the anæsthetist?—The surgeon.

9688. He can say which anæsthetic he wishes?—Yes.

9689. Dr. Willcox.—In difficult cases I take it that you would consult with the anæsthetist as to which anæsthetic should be used?—Certainly.

9690. And with a physician possibly?—If necessary.

9691. SIR THOMAS BRAMSDON.—With regard to dentists, you think that nitrous oxide is a very safe anæsthetic?—Yes.

9692. You know that there are a large number of persons who are not registered dentists?—Yes.

9693. They are unregistered, but they claim to have a good deal of knowledge of the practical work of dentistry?—Yes.

9694. Would you give them the right to administer nitrous oxide?—Certainly not.

9695. Would you give a registered dentist the right to administer a local anæsthetic?—Yes.

9696. You think that is safe, such as cocaine?—Yes.

9697. I think you are of the opinion that registered dentists are fairly competent?—Yes, I think the L.D.S. is a very substantial qualification. And, besides, you see you have the advantage of protection to the State through his being a registered man; you have that disciplinary control over him. Unregistered persons simply prey upon the public, because they escape with only an occasional death and they still play havoc with the public.

9698. CHAIRMAN.—You may have a very skilled unqualified man, but you have absolutely no guarantee?—That is so; and instead of their being convicted of manslaughter they escape punishment.

9699. SIR THOMAS BRAMSDON.—Do you know anything about the Incorporated Society of Adaptors and Extractors of Teeth?—I have heard of it.

9700. You do not know anything about it of your own knowledge?—No, not personally. That is how the law is evaded, of course. These people found out very soon that they could evade the law respecting registration, by forming themselves into companies, and unfortunately the House of Lords has never accepted the various amendments of the law which the British Medical Association have put forward in order to stop this evasion of the Registration Acts. We have made numerous attempts, beginning with an amendment of the Companies Act. Mr. Ritchie did accept it while it was passing from House to House, and then unfortunately he threw it away again in the House of Commons; consequently the public remains unprotected to this present day.

9701. CHAIRMAN.—You say that general anæsthetics ought not to be administered except by a qualified practitioner?—Yes.

9702. I suppose you confine that to anæsthetics administered for the purposes of a surgical operation?—Yes.

. . . . . .

The witness withdrew.

TWENTY-SEVENTH DAY.

Friday, 5th November, 1909.

PRESENT:

SIR MACKENZIE CHALMERS, K.C.B., C.S.I. (*Chairman*).
SIR HORATIO SHEPHARD, LL.D.
MR. WILLIAM H. WILLCOX, M.D.
MR. J. F. MOYLAN (*Secretary*).

Mr. WILLIAM FORREST BOWEN examined.

11,086. CHAIRMAN.—You live, I believe, at Stonwall House, Bolton, in Lancashire?—I do.

11,087. And I think for 24 years you have carried on practice as an extractor and adaptor of teeth?—I have.

11,088. And you are a member of the Association of Extractors and Adaptors of Teeth, with regard to which Mr. Butterfield has already given evidence before the Committee?—That is so.

11,089. You built your present surgery, you say, 17 years ago?—I did.

11,090. And this practice you keep under your individual control?—Absolutely.

11,091. And all operations are performed by yourself?—Yes.

11,092. Have you no assistants?—I have assistants, but they do not perform operations; they do mechanical work only.

11,093. I believe you are one of those happy people who have never had any action brought against them?—I never have.

11,094. What is your average number of patients?—Taking the 24 years at least 100 a week.

11,095. Will you tell us what training you yourself have had, and how you came to take up this practice?—First I had a good general education. I was brought up at Preston Grammar School and at 17 sat for the matriculation examination of the London University.

11,096. DR. WILLCOX.—Did you pass it?—All but the Greek. Then I was with my father, who was a medical man in Preston.

11,097. CHAIRMAN.—Your father, I think, was a doctor of medicine?—Yes, an M.D.

11,098. Of what university?—St. Andrew's. He was also L.M. and L.S.A. of London and a L.F.P. and S. of Glasgow, and he was in practice at Preston for upwards of 30 years.

11,099. And he was a justice of the peace for the borough?—Yes.

11,100. How long were you an assistant to him?—It extended over five years. For a short period I went out in that time for scientific training to a scientific college.

11,101. When you say that you were an assistant to your father, were you apprenticed to him?—I was engaged by him; I was paid a salary.

11,102. What did you do?—I dispensed in the first instance and in time I was allowed to prescribe. I have been out and seen patients.

11,103. Did you report to your father or did you prescribe yourself?—I prescribed myself when he was not in, but when he was anywhere about he prescribed.

11,104. You were what is commonly called an unqualified assistant?—Yes; it was before the days when the new regulations came in, which, I think, was in 1886; and there were some fresh regulations made also, I think, in 1890.

11,105. Your father had a general practice, of course?—Yes.

11,106. But you never studied dentistry, I suppose?—Yes, I did, because my father had a fair amount of dental practice. Originally he started practice in a country district out at Crosston, near Ormskirk, and he did all the dentistry out there. He was the only doctor in the district, and I have his instruments yet, in fact. These country people used to come in and bring their children and have a large amount of extractions done, and then it was allowed as a perquisite to all his assistants that they should pocket the money. But we had to do it out of surgery hours. His surgery hours were from 9 to 10 in the morning, and after that time we could have the money for ourselves.

11,107. Did you have any special training in dental work besides that?—I have taken lessons in the mechanical work, read text books, &c. Statics and dynamics I learnt at school and college.

11,108. Lessons in making artificial teeth, you mean?—Yes.

11,109. How did you learn to administer anæsthetics?—With my father. I had been with him in many cases. He gave nothing but chloroform; he never gave ether all the five years. He never gave anything but chloroform all the five years and never had a death under it.

11,110. The local anæsthetics were not known at that time?—Morphia was used, that was all; but you really cannot call that a local anæsthetic. It is a local anæsthetic in a sense, but it has a more general effect.

11,111. Were cocaine and those things used?—Cocaine was not generally known until 1884; it was not on the market until then. I used it first for the eye.

11,112. You have used a good deal of cocaine, I understand, in your practice?—I have.

11,113. How did you get your knowledge and experience of it?—I got my knowledge and experience of it, you might say, from text books, journals, inquiries and conversations with medical men. I know 20 or 30 medical men, I have them as

patients; in fact, I am very friendly with a good many, and of course I have discussed matters with them. And I had to make experiments, of course, the same as anybody else. I was one of the pioneers, I take it. I took many sophygmographic tracings.

11,114. You had to try it on your patients?—Yes, I used a small enough dose to start with (unfortunately, like everybody else, I used stronger solutions at first than are considered necessary now), and I could not take so many teeth out, only one or two.

11,115. With the doses that you give now, do you get complete analgesia?—Yes, quite, in the healthy tissues, complete analgesia.

11,116. You have never had a fatality?—Never. I have never seen a person become unconscious under it, I have seen two cases that became unconscious through watching teeth being taken out.

11,117. They fainted at the sight?—Yes.

11,118. That is to say, people whose teeth you were not taking out?—Yes, people who came with the patients.

11,119. You estimate, I think, that you have taken out 200,000 teeth? –More than that.

11,120. And you have administered sub-mucous injections, 100,000 times, is that with cocaine?—Cocaine mostly; it varies.

11,121. You have administered them, you say, about 100,000 times?—Yes, more.

11,122. Have you used anything else besides cocaine?—I have used eucaine and various preparations that have been brought out. I have tried them, you know. I think cocaine is far superior to all the rest.

11,123. And you have never had a death or a sloughing of the gums?—No. But the preparations are always fresh. I mix my preparations fresh for every patient.

11,124. Do you sterilise them?—Yes, it is mixed with water and the water is sterilised every day. I fill about half a dozen bottles with boiled and distilled water and pour it into the bottles in a boiling state, filled to the stopper.

11,125. DR. WILLCOX.—Do you boil the cocaine?—No, it would destroy the cocaine to boil it.

11,126. Do you have a solution of cocaine which you add to the sterilised water?—No, I use it in tablet form.

11,127. CHAIRMAN.—Do you give any other anæsthetics besides cocaine submucously?—Not generally.

11,128. You have never given chloroform submucously?—No, but I have given chloroform by inhalation to my own father.

11,129. But in your own practice as a dentist you have never given it?—Not for taking teeth out. I do not think it is a wise thing.

11,130. Do you give nitrous oxide?—No, I do not. I have helped to give nitrous oxide many times and I am conversant with it, of course. I know the peculiarities of it.

11,131. As regards unregistered dentists, if they were forbidden to use nitrous oxide, do you think they could get on very well with cocaine, and that nitrous oxide is not required?—No. I put it in this way. If you limit the unregistered, and the ante 1878 men, as I call them, or any of them, to any particular anæsthetic, you force some of them to use one that they are not accustomed to.

11,132. But in your own practice you find a local anæsthetic quite enough?—I find that in my hands it is more successful than I think gas would be, because I have a longer time for the operation and the gums heal better; and I can give it to any one. I have never refused to give it to any person since I commenced business on account of delicate health or old age. With gas, I should pick and choose; I should reject 50 per cent. of the people who come to me, not that there is any special danger, but that I get many cases in which the duration of anæsthesia produced by nitrous oxide gas would not be sufficient.

11,133. On what ground? Do you consider it unsafe?—No, I should not consider it the most suitable anæsthetic in a tedious case? it is undesirable in that sense. I do not think it unsafe, but all are not good subjects for it. Where the gum is unhealthy gas is better than cocaine. I think that the freedom from accidents among, say, unregistered practitioners, and ante-1878 men, is due to their having no recognised qualification. I think they are on sufferance, and as they realise they are on sufferance I think there will be no accidents from it. But if it is directly legalised that they shall give gas only, then I think it might be a risky thing in the hands of any one who has not had some experience in that particular anæsthetic.

11,134. I am not quite sure that I appreciate your point. You cannot enact that a man shall give anæsthetics?—I know that, but I mean to say that the Dentists Act says that a person shall be empowered to do this, that, and the other. If you put it in a negative way, I think it is better.

11,135. In fact, you are satisfied with the law as it stands at present, which says nothing one way or the other?—Yes. I think that if people could show that they have given an anæsthetic for some time they should still be empowered to use that particular anæsthetic.

11,136. I think you want to tell us something as to what caused you to give a local anæsthetic like cocaine?—It was really because I was afraid of taking a general anæsthetic myself. When I first went to Bolton I suffered very much from neuralgia—I had about eight or nine weeks' suffering. I had several teeth taken out.

11,137. With or without anæsthetics?—Without, as a rule—with a calorific fluid principally composed of ether, I believe.

11,138. It froze?—It has a freezing action. It was not satisfactory.

11,139. I think that the result of your experience is that the risks in giving cocaine or a similar local anæsthetic are nil?—Yes, under proper conditions.

11,140. I was going to ask you about that. You have had a large experience and considerable skill, no doubt; but you would not trust them to anybody, would you?—Yes, if they knew the routine and with the patient placed in a recumbent position and with a reasonable dose. When there is a little pallor in the face, provided you put the patient in a recumbent position and the chair is turned back, it is absolutely safe.

11,141. In unskilful hands?—Yes, they could not take any harm if the dose does not exceed half a grain.

11,142. DR. WILLCOX.—Does it not require skill to know whether it is dangerous?—No, not if you see the patient turning white.

11,143. But it is skill that makes you notice whether the patient is turning white, is it not?—Anyone would notice it.

11,144. CHAIRMAN.—Our difficulty, you see, is this. You may have certain unregistered people with very great skill and a very long training, but when once you get away from registration you have no guarantee?—There are 2,000 of the present registered practitioners of dentistry who have not had the training that members of our society have had.

11,145. But there is no guarantee for their training?—There is a guarantee for the training of our members. There is no absolute guarantee for the others. I have journals here which will prove that I gave demonstrations three or four years ago and mentioned all these statements I am telling you now, and also a lot of the things mentioned in the Minutes of Evidence as regards the action of unregistered people not sterilising the gums and other matters.

11,146. You may have a guarantee as regards the members of your society, but what is the guarantee as regards a man who has not gone through that course?—A man will only use an anæsthetic that he is accustomed to and he feels confident about. We know, of course, that there are such people as insane people in the world, but I have only come across one or two cases in which people have administered anæsthetics in you might say——

11,147. A crazy way?—A crazy way. When persons are dealing with human life they are naturally more careful than if they are dealing with material.

11,148. In your opinion, at any rate, if people would always use proper cocaine and use a 1 per cent. solution you say that it is absolutely safe?—Absolutely safe, and in support of my assertion I beg to refer the Committee to an article by Professor H. A. Hare, M.D., professor in therapeutics in the Jefferson Medical College, Philadelphia, and editor of the *Therapeutical Gazette*, in which journal, writing under the heading of "Progress in 1892,"

he said "that within the last decade cocaine has proved a gain, the value of which cannot be estimated both for its anæsthetic effect and its general systematic influence." Reclus, at a meeting of the Académie de Médicine, of Paris, said that "local anæsthesia by injections of cocaine, of which he has been a partisan for ten years, had not yet found many adherents. He thought it desirable to recall in a few words the principles to be observed in its employment and to explain the reason why accidents had been reported, from time to time, from its use. He affirmed once again the eminent anæsthetic properties of cocaine, which he considered to be superior to all those used with the same therapeutic object, and in particular to guaiacol, a drug which had recently been warmly recommended by one of his colleagues. He thought that the accidents attributed to cocaine could easily have been avoided if the indications he had recently laid down had been followed. They were to use only 1 per cent. solutions, never to exceed three or four grains of cocaine, to always place the patient in a recumbent position, and to avoid penetrating a vein. It was by observing these rules that he had been able to perform 3,500 operations without a single accident, nor did he even once observe an attack of syncope or vomiting. He employed cocaine exclusively where the field of operation was not too extensive. In two cases he used it with success in amputating the arm, where, by reason of cardiac trouble, he was not able to give chloroform." That is taken from the *Medical Press* of May 27th, 1896. I might say that there is no solution on the market for dental purposes that contains above 1 per cent., and 40 minims is supposed to be the limit of dose given.

11,149. Now, will you give us the result of your own experience?—The result of my experience is that when cocaine was first introduced all the dentists who seem to have taken to it used too strong a solution: they used a 10 per cent. solution quite commonly.

11,150. And they had 10 per cent. of accidents, I suppose?—More than 10 per cent., I daresay. And the solutions, of course, decomposed, which they were not aware of and grew a fungus and the cocaine was very impure. And the doses were excessive.

11,151. And now people know better—at any rate you do?—Yes.

11,152. You have something to tell us about Dr. Clifford Mitchell?—Dr. Clifford Mitchell, writing in "Dental Chemistry and Metallurgy," 4th edition, in 1896, page 307, says, "the purity of the drug is of the greatest importance; that the permanganate test should be used for possible organic impurities, and that toxic symptoms have followed injections of 20 per cent. solution, relieved by inhalation of amyl nitrite, three drops at a time." If it is possible to give a 20 per cent. solution to a person without any serious result, certainly I think a 1 per cent. solution should be considered safe.

11,153. You would not like to give a 20 per cent. solution?—No, I should not.

11,154. Or even a 5 per cent. solution?—No, my reason is that with a 20 per cent. solution you might get sufficient absorption to have an effect on the heart. I do not think a 1 per cent. solution has any direct effect on the heart.

11,155. Do you ever find that in injecting into the gums you affect the glands?—No. I have heard of people who have had excessive doses of cocaine complaining afterwards of "a lump in the throat," but that is *globus hystericus* and has nothing whatever to do with the cocaine.

11,156. You have never perceived paralysis of the breathing apparatus in the throat as the result of your administration of cocaine?—Never.

11,157. You yourself, of course, prefer cocaine very much to a general anæsthetic?—To anything, for dentistry of course.

11,158. Not for taking off a leg, of course. I see you say that, in your opinion, the use of cocaine does away with any danger of having to perform the operation of tracheotomy?—Yes.

11,159. Is that because you find that there is no paralysis of the air-passage?—Yes, and on account of consciousness. If any foreign substance got into the larynx, I am afraid it would come out quicker than it went in; or if in the gullet the patient would probably swallow it. I have had two people swallow teeth—they simply passed through them.

11,160. Were you able to relieve them? What did you do? Did you give them an emetic?—No, I simply told them to take soft food, that was all.

11,161. And nature would relieve them in time?—Yes. The healing process is more rapid than with a general anæsthetic, the reason is that the part is kept anæsthetised for about four hours. For half an hour it is distinctly so—from 20 minutes to half an hour—it depends on the circumstances, and you might say that the result of the mechanical action of forcing the tooth from the socket has died away before the anæsthesia has passed away, and the consequence is that the gums are not sore on the following day, and you can take teeth out day by day from the same patient and no swelling or soreness follows.

11,162. In conclusion, what have you to tell us?—As a matter of safety it can be administered to old people, even with senile heart. A person past middle life will tolerate cocaine better than a person under middle life, in the teens say. I suppose perhaps the right side of the heart is stronger—there is more determination of blood to the head after middle life as a rule. I do not approve, however, of some of the proprietary preparations on the market. And I think that all preparations put on the market should bear the date of dispensing, if they contain cocaine

which cannot be boiled to sterilise it; they should have it stated on the label, not only in the interest of the dentist, but in that of everybody for whom it is used. Of course eucaine solutions can be sterilised by boiling, but I do not advocate any ready-made solutions of cocaine, because they lose their power by keeping and become toxic as well; in time there is a fungoid growth.

11,163. Any general conclusions that you have come to we shall be glad to hear?—I might say that in Lancashire and the North yonder, generally from 70 to 80 per cent. of extractions are under local anæsthetics to-day.

11,164. In supersession, so to speak, of nitrous oxide?—Yes, nitrous oxide is dying out very rapidly. There is not one case of nitrous oxide now this year, I think, where there are 20 or 30, possibly 40 cases, of these local anæsthetics. A year or two back, of course, it was different.

11,165. It was just the other way about?—Yes, a few years back.

11,166. How many non-registered people are there in Lancashire to-day do you suppose who are administering cocaine?—If you take my own district, Bolton, say, in Lancashire (I see it is not mentioned in Dr. Hewitt's list or given in the *Lancet*), the Poor Law Union and the district just around, there is a population of 600,000, I should say roughly. There are about five licentiates in dental surgery, and there will be 30 unregistered practitioners and about 16 registered as being in bonâ-fide practice in 1878. Farnworth has about 26,000 or 27,000, and there is not a registered dentist in the place. There are a few doctors in Farnworth, but they do not take out teeth.

11,167. The ante-1878 men are under the old system, but, still, they are registered?—Yes, those registered men were mostly old spinners in mills and men from the foundries who did their dental work at night and got registered. I know of one who gave gas to his present wife, many years ago, not very far from me, and it pretty well frightened his life out. He has never given gas since.

11,168. He frightened his wife's life out, did he not?—Very nearly. He frightened himself, anyway. And not only that, but the registered dentists are sending out unregistered men with a bag and gas in a cylinder to give gas in the homes of the people.

11,169. You mean, to assist in it?—No, they are going out single handed. Unregistered young men are going out with a bag and a cylinder with gas in it into the country districts and taking teeth out for registered dentists.

11,170. Would it not be advisable that somebody should call the attention of the General Medical Council to it?—I think the practice of dentistry and the use of anæsthetics by unregistered people covered by dentists has been reported to the Council and they have taken no action so far as I know.

11,171. In you opinion is it not exceedingly objectionable that a man should administer a general anæsthetic and operate at the same time?—Certainly, he ought to have somebody at least who is competent with him; a man who has had a few years' experience is quite sufficient.

11,172. But still there ought to be some person with some experience present. However skilful a man may be he is not fit to operate and look after the anæsthetic at the same time?—No.

11,173. Apart from other dangers?—Yes, there is a danger in a man operating and giving the anæsthetic also.

11,174. SIR HORATIO SHEPHARD. That does not apply to local anæsthetics?—No, not to local anæsthetics.

11,175. CHAIRMAN.—I am not speaking about yourself, you have had a long training and are a man of skill and experience; but what guarantee is there that these 30 unregistered practitioners in your district, when they first took to administering cocaine, knew anything about it?—I do not think any man would take to administering cocaine unless he had had some experience of it. The bulk of those 30 men have had a proper apprenticeship. Most of them have had a proper apprenticeship and the indentures say that they will be taught all the branches of dentistry. They are taken as apprentices by registered dentists before they have entered for the preliminary examination, and when the five years are up, they find that the five years have been wasted, it does not count.

11,176. You mean that a good many men go as apprentices to registered dentists, and then they find after they have served their apprenticeship that it is of no use?—Yes, the registered dentists take them for boy labour—it is nothing less; and they take a premium with them too.

11,177. SIR HORATIO SHEPHARD.—To do the mechanical work in the workshops?—Yes; they operate also later, and when they have finished their time and are compelled to make a living for themselves they are all that is bad.

11,178. CHAIRMAN.—Generally, what is your objection to the ordinary dentist's course that a dentist has now to go through in order to be registered?—Supposing I had to put my son through, I cannot teach him dentistry in any shape or form to count as part of the curriculum; I should have to pay a premium to some registered person. He would have to serve the usual course and there would be no recognised instruction in my practice. He would have to go through the usual curriculum at some recognised teaching institution.

11,179. You think that the qualifications are put too high under the present Act?—Far too high. I do not mean to say that I would reduce the qualifications; the higher qualifications a man gets the better. If he can add medical qualifications to

his dental qualifications so much the better; he will get a better class of patients, no doubt, and people who can pay. But I think the L.D.S. qualification at present both costs too much and is too exclusive to benefit the working classes. I can give you an instance in point. In the flying week at Blackpool, on the Monday, a person went in Manchester to five or six dentists and found them all out. She went to a certain well-known L.D.S., who speaks very often at the British Dental Association meetings——

11,180. And he was flying?—I do not know whether he was there or not, but there was someone in attendance and half a guinea was demanded for taking her tooth out in the ordinary way without an anæsthetic.

11,181. That is too much for ordinary people?—Yes. I say that the members of our Society in particular are a necessity. I know there are people who ought not to be allowed to practice, but take the respectable unregistered practitioners, they are a necessity to the public, there is no doubt about it. And anæsthetics are also a necessity; the people will not have a tooth out without.

11,182. Really?—I do not take five teeth out a week without anæsthetics. In Lancashire they will not have it without anæsthetics. If a man did it his business would be gone. I do not take five teeth out a week without anæsthetics, and have not done so for the last 20 years.

11,183. But on the other hand (I am interested in what you say) you think that general anæsthetics are gradually going out and local anæsthetics are taking their place?—Yes, simply because a person will not lose consciousness, they prefer to be "present at the operation."

11,184. There is no special pleasure that I know of in seeing your tooth come out, but everybody, of course, has an objection to being made unconscious?—I may say that I believe the principal trouble with local anæsthetics is not due to the anæsthetic, but to shock-fright.

11,185. Do you think that a local anæsthetic does not diminish shock?—Yes, it diminishes surgical shock certainly. It is nervous shock—fright—that I mean.

11,186. You mean that a person who has a local anæsthetic, still suffers from fright?—Certainly, if they are facing an operation. Well, I am rather nervous myself, I might as well admit it. In fact it is through that nervousness that I dare not take a general anæsthetic myself, and that I gave my attention to "locals."

11,187. I think you know that there has been an action lately against the London Hygienic Institution. That body has nothing to do with your society?—No, we think them very much below us.

11,188. DR. WILLCOX.—You had had a very extensive medical experience with your father before you took up dentistry at all?—Yes, five years.

11,189. And you gained a lot of practical knowledge in medicine and surgery during that time?—Yes.

11,190. So that your knowledge is probably greater than that of many other members of the Society which you represent?—Possibly on one point only—on this particular point; but there are lots of members of the Society who have far more knowledge than I have, say, on general anatomy or physiology.

11,191. But on general medicine and surgery you probably have much more knowledge that the average?—Yes; but there are exceptions; there are some very clever men in the Society.

11,192. I may take it that you yourself did not undertake any courses of anatomy or dissecting?—No, I simply had books. I have a large library of medical books now. I have all my father's books and his instruments too, for that matter.

11,193. As regards cocaine, how many teeth would you take out at a sitting under cocaine?—Not more than five.

11,194. You would go so far as to take out five?—Yes. Would it be better if I showed you a report in proof *(presenting copies of the "Mouth Mirror")* as to two demonstrations I have given?

11,195. Thank you very much, but I think that answer is sufficient. For taking out one tooth, how many drops of solution would you use?—I usually mix the same quantity for all. I usually mix half a grain of cocaine and I should possibly use all the lot for two, three, four, or five.

11,196. Would you use more than half a grain?—Never. I have given half a grain twice in the day and repeated it every day for a week.

11,197 CHAIRMAN.—You mean, taking out teeth day by day?—Morning and night—two sittings in one day. I might say that my business is not confined to Lancashire; I have patients here in London now.

11,198. DR. WILLCOX.—Do you frequently have to place your patients in a recumbent position before giving them cocaine?—No; I do not think I have had to place one in a recumbent position for three or four years, and then never for above five minutes, and never before the operation.

11,199. Are you aware that cocaine affects the heart?—I do not think a 1 per cent. solution affects the heart directly. I do not know how it can get there at all.

11,200. Do you know that in that recent case of the London Hygienic Institute a 1 per cent. solution was used?—I do not know what strength they used, or how much of a ready-made solution. They say all sorts of things, of course.

11,201. Do you know that some people are very susceptible

to cocaine?—Yes, hysterical people only, but it is not of a dangerous nature. Hysterical people, anæmic people, and people subject to tobacco. Alcohol does not affect them.

11,202. CHAIRMAN.—Do you mean people who smoke cigars?—If people come who have recently smoked a strong pipe or a strong cigar you will very often see a slight pallor—nothing more than that.

11,203. DR. WILLCOX.—Would you be surprised to know that two-thirds of a grain of cocaine has cause death if it is given under the skin?—I have known a hypodermic needle-prick cause death, without anything more, from shock.

11,204. Do you admit that cocaine is a poison? It is a poison in a very large dose; but I have Dr. Buxton's statement here that he has known a person take 20 grains and it did not poison him.

11,205. CHAIRMAN. Would that be a person who was habituated to it?—No, a single dose.

11,206. DR. WILLCOX.—Are you aware that several cases are recorded where one grain caused death?—I doubt if it was the cocaine that caused death.

11,207. Cases in which death has followed the administration of cocaine?—It may be. The only case I am conversant with at present is the case of a Russian chemist over here a short time ago, and he gave it to an anæmic woman and probably kept her in an upright position. He did not seem to know much about cocaine.

11,208. You do not admit that cocaine is a dangerous poison?—Under proper conditions, I do not. It is much safer than morphine. Morphine is a very unreliable injection. The margin of safety with cocaine I should think is from 10 to 20 times that of morphine, and hospital nurses give morphine regularly.

11,209. Do you think that great care is necessary in the administration of cocaine?—Reasonable care only; common-sense care I think is all that is necessary, if the routine is known.

11,210. Do you think that any person should be allowed to give cocaine without some training?—I do not.

11,211. CHAIRMAN.—Where would you draw the line?—I should draw the line at a person who has been at a fair number of demonstrations and has had some training as apprentice with a dentist and has seen a sufficient number of cases.

11,212. DR. WILLCOX.—What guarantee can you have as regards that training?—In regard to our Society, a man must have served an apprenticeship of not less than three years and must have been two years on his own account; it was one year—now it is two years; so that he must have had at least five years' experience, and attended many demonstrations.

11,213. CHAIRMAN.—I do not understand that two years on

his own account. That seems to be an interval during which he is like Mahomet's coffin, suspended between earth and heaven?—After he has finished his apprenticeship—he may have stayed longer than three years with a dentist, but he must have served three years' apprenticeship—if he wants to join our Society he must also have been in business on his own account as principal at least two years.

11,214. SIR HORATIO SHEPHARD.—But for those two years he is a dangerous man?—No; he has had not less than three years' training previously, usually five years.

11,215. CHAIRMAN.—He must be a dangerous man because you will not have him without the two years. Otherwise, why do you make that condition?—The reason is that we want to keep our Society select in the sense that we will not have inexperienced and unproven persons as members. We are responsible for them.

11,216. Dr. WILLCOX.—Is it your view as regards the administration of cocaine that only qualified medical men, qualified dentists and members of your Society should be allowed to give cocaine?—I think it is perfectly right that any man who can make a statutory declaration that he has given it for a period should continue to give it; but if any Act was passed I should certainly debar all, except medical men, from giving chloroform.

11,217. I am talking about cocaine. What do you say as regards cocaine?—I think that cocaine is as safe as any anæsthetic that there is.

11,218. But you have not answered my question. I want you to tell me, is it your view that qualified medical men, qualified dentists, and members of your Society only, should be allowed to give cocaine?—No, that would be rather unfair to some who are not members of our Society, who have a fair amount of knowledge and experience. We do not say that we represent every skilful unregistered person, but we represent the bulk of them.

11,219. What would you suggest as being the limitation for the future. Assuming, as you say, that people who have had experience now in the administration of cocaine may be allowed to give it, what guarantee have you for the future?—I should be inclined to suggest that a register should be formed on the lines of the Dentists Act, and that those who could show that they were *bonâ-fide* giving any particular anæsthetic other than chloroform should go on that exemption register.

11,220. SIR HORATIO SHEPHARD.—That is for the past. What do you suggest for the future?—They would not be able to go on; they would not be administering it.

11,221. CHAIRMAN.—Would you let future generations go on that register?—No, not future generations. Then the door would be closed immediately.

11,222. At a fixed date?—Yes.

11,223. DR. WILLCOX.—Then how about men taking up the practice of dentistry?—They must go through the usual course of training, I suppose.

11,224. What is that training to be? We have qualified medical men and qualified dentists, and what about the rest?—There would be no more after we died out; they would all be qualified by the usual course.

11,225. SIR HORATIO SHEPHARD.—But you tell us that is impossible?—No, you would get them in time. It will take time.

11,226. CHAIRMAN.—Your Society is to be a sort of intermediate stage?—No; I mean to say that we should be in the same position as the ante-1878 men—that is, the men described as being in practice in 1878—are now.

11,227. What you mean is that you want an extension of the 1878 principle to the present day, so as to include you?—Yes.

11,228. And then what about the future?—They would have to go through the usual educational portals.

11,229. DR. WILLCOX.—Then for the future only qualified medical men and qualified dentists would be allowed to administer cocaine?—Yes, I think that is the only reasonable course.

11,230. SIR HORATIO SHEPHARD.—Would not the result of that be that 20 or 25 years hence the same trouble would begin all over again?—No, it cannot possibly; nobody would be allowed to administer anæsthetics except those on this particular register.

11,231. CHAIRMAN.—But your Society would be adding new members?—But you would not take the Society as a Society, you would take the members individually.

11,232. SIR HORATIO SHEPHARD.—Besides you have told us that the course required for the L.D.S. is a course which it is impossible that the men can go through, and that it is too expensive?—I do not know how they would have to deal with that. The only thing is that when the door is closed there would be a greater inducement for people to go to colleges.

CHAIRMAN.—Surely that ought to have happened in 1878—that is our difficulty.

11,232a. SIR HORATIO SHEPHARD.—The closing of the door did not have that effect in 1878. Why should it have that effect now?—Only the title was reserved—practice was not controlled as it would be in this case.

11,233. CHAIRMAN.—What you suggest is that the dose given in 1878 should be repeated?—Certainly. We have vested interests, we consider, now. You would probably think so if you had built a surgery like I did 17 years ago with about £3,000 sunk there.

11,234. We do not dispute that. The difficulty is where to draw the line between individuals. When once you get outside the regular qualifications, the difficulty is where to draw the line between individuals with great skill and experience and others who have not that same skill and experience?—I might suggest also, as regards cocaine, that in comparison with general anæsthetics the dose is a fixed dose, and that with general anæsthetics, particularly the more deadly ones, you bring in the skill of the operator to a considerable extent, because the dose is not fixed.

11,235. It is not the case then, I assume, with local anæsthetics as it is with general anæsthetics, that according to the individuals you have to give the dose?—With local anæsthetics it is a fixed dose generally. With a general anæsthetic you have to have skill to know when the patient has had sufficient. With gas it is almost a fixed dose; they very rarely give gas for above 50 seconds—an inhalation of about 11 or 12 inspirations; so that it is practically a fixed dose.

11,236. DR. WILLCOX—Your view is that general anæsthetics must be given with very great care?—Yes, more so than local anæsthetics. That is one reason why I do not use them. I can do a more difficult operation under cocaine than they usually do with any general anæsthetic. To get some canine teeth out, I have occasionally to use both hands to remove them, and if the person was under a general anæsthetic it would pull him out of the chair, or you would have to have somebody to hold him. Lancashire teeth, you know, are said to be different from what they are down here. These colliers are not allowed to smoke in the pit, so they chew tobacco all day, and their teeth are worn flat on the top; they become part and parcel of the jaw bone almost in time, and you can hardly sever them from the bone. They are more used, of course, and like muscle, the more they are used the harder they become; they become more knit to the bone.

11,237. Do you think that some restriction should be put upon the administration of general anæsthetics?—Only on the more powerful ones, not on gas.

11,238. On chloroform?—Certainly.

11,239. And ether?—I think a medical man ought to be called in for ether and for ethyl chloride.

11,240. In fact, for all but gas?—Yes, gas and local anæsthetics, I think, ought to be left reasonably free.

11,241. You say that you think a medical man ought to be called in for other general anæsthetics?—Yes, the more powerful ones.

11,242. CHAIRMAN.—Will you kindly hand in, so that we may get it upon the notes, the statement that your solicitor has kindly furnished for us, and also some corrections that Mr.

Butterfield wishes to make?—Certainly. I might say that I have here an original copy of the depositions taken in the case of Eliza Ann Cole, a Nottingham case which has been mentioned to you, and which under a misunderstanding has been mixed up with a Burnley case, in which the man concerned was not a member of our Society. I may further mention that the head of the London Hygienic Institute offered a subscription to our Benevolent Fund, which was refused. He is not a member of our Society.

The witness handed in the following documents :—

STATEMENT OF MR. PERCY JAMES HALL ROBINSON, Solicitor to the Incorporated Society of Extractors and Adaptors of Teeth, Limited.

With regard to questions 2955, 2956, and 2957 in Mr. Butterfield's evidence on the Ninth Day (First Volume of Evidence, page 108), as to how the law could distinguish between a member of the Incorporated Society and any other person who chooses to call himself an extractor of teeth, the Society would suggest that if prohibition of the administration of anæsthetics were thought desirable in the interests of the public, such prohibition and restriction could be brought about by the following process, which would at the same time preserve to existing unregistered practitioners their right to practise, viz. :—

The passing of a new Act to amend the Dentists Act, 1878.

This Act should provide in effect :—

(1) That after a specified date, say, 1st January, 1911, the administration, by any person or persons, not registered under the Act or under the Dentists Act, 1878, and not being a legally qualified medical practitioner, of a general anæsthetic (to be defined by the statute) should be an offence punishable on summary conviction of the offender by the imposition of a penalty of £20 upon his first conviction, and £50 upon a second or subsequent conviction.

(2) If a registered practitioner should employ an unregistered person, not a legally qualified medical practitioner, to administer such general anæsthetic he should be liable to the same penalties as the administrator of the anæsthetic.

(3) Any person who has been *bonâ fide* engaged in the practice of dentistry and dental surgery as a principal for himself or the firm of which he is a partner, or the company of which he is a director for a period of not less than two years prior to the passing of the Act shall be entitled to be registered on the register created by the Dentists Act, 1878, and kept pursuant to the provisions of that statute. The proof of the person being so engaged shall be statutory declarations that the applicant has

been engaged in such *bonâ fide* practice of dentistry and is of good character and repute by—

(*a*) The applicant himself.

(*b*) A legally qualified medical practitioner of the town or one of the towns in which the applicant carries on his practice.

(*c*) By a resident householder of such town.

(4) In the event of a refusal by the registrar to register an applicant, the applicant shall have the right of appeal to a judge in the King's Bench Division sitting in Chambers, who shall have the power (if he thinks fit) to order the attendance of the applicant and his references before him for the purpose of examining them orally as to the contents of their statutory declarations.

(5) Any person making a false declaration should be liable to criminal proceedings under the Statutory Declarations Act, 1835.

(6) All persons registered under this Act should be entitled to all the benefits and privileges of the Dentists Act, 1878, provided that nothing in this Act shall confer upon such persons the right to use the title of "surgeon" in connection with any other description, title, or designation, and all persons registered under this Act shall be subject to the provisions and regulations relating to registered dental practitioners contained in the Dentists Act, 1878.

The Act would have to be read in conjunction with the Dentists Act, 1878, and certain sections of that Act would require to be repealed or amended to fit in with the altered conditions.

The foregoing suggestions are merely put forward as a basis upon which to frame an Act of Parliament, and do not deal with the matter in detail, but if the Committee would permit it, the Society would be pleased to put their proposals more fully before them.

With regard to the memorandum of Mr. Morton Smale, in which he states :—

"I consider that no unregistered practitioner is entitled to practise as a dentist or to teach others to evade the provisions of the Dentists Act, or that he is justified in administering anæsthetics."

The Society desires to call the attention of the Committee to the following dicta of judges of the Appellate Courts of the United Kingdom and of the promoters of the Dentists Act, 1878.

The Master of the Rolls, Sir H. Cozens Hardy, said (on the hearing of the case of Bellerby v. Heyworth and Bowen in the Court of Appeal) :—

"There is nothing in the Dentists Act to prevent a man doing any dentists' work. It is not wrong under that Act for any man to do dentists' work, and it is not wrong for him to inform the public that he does that which it is lawful for him to do."

Lord Moncrieff, in the case of Emslie v. Patterson (Scotch Law Reports), said :—

"The Act (*i.e.*, the Dentists Act, 1878) does not prohibit the practice of dentistry."

The Lord Chief Baron of Ireland, in a case before the Irish Courts, said :—

"The Act does not prohibit an unregistered person from practising."

Sir John Lubbock, in introducing the Dentists Act, 1878, into the House of Commons, said :—

"The principal object was to protect the public against quacks by giving them an opportunity of ascertaining whether dentists were properly qualified."

And when the Bill was in the Committee stage he said :—

"The real object of the Bill is to enable the public to distinguish between educational dentists."—(Hansard's Parliamentary Debates.)

While this Bill was under consideration Sir John Lubbock received a deputation of chemists and druggists, who protested that their rights were being interfered with by the Bill, and he said that it was not the intention of the Bill to interfere with such simple operations as extracting or stopping teeth.

The Dentists Act, 1878, was promoted by the Dental Reform Committee, the late Mr. John Tomes acting as President, and the late Mr. Smith Turner as the Secretary of the Committee. The Committee issued a circular to Members of the House of Commons appealing for their support for the Bill, and stated in this circular :—

"The object of the Bill is to provide for the registration of dentists at present in practice and of such dental practitioners as shall hereafter have been properly educated and examined, for the practice of their profession, and not to establish an exclusive right to practice, but an exclusive admission to the register and to the use of the title 'Dentist,' 'Dental Practitioner' and 'Dental Surgeon.'"

The Society submit, therefore, that there is no foundation for the suggestion of Mr. Morton Smale that their members are not entitled to practice, or are evading the provision of the Dentists Act, 1878.

They further submit that the statistics tendered to this Committee, and the evidence given before the Committee of the House of Lords who held an enquiry in 1907 into the practice of dentistry by companies, show conclusively that the unregistered practitioners are carrying on their practices and are administering anæsthetics to the benefit and advantage of the community.

They desire further to point out with reference to Mr. Tomes' statement (*Q.* and *A.* 4216): "That much mischief is

done by unqualified practitioners in the Midlands and the North." No cases were quoted in support of this statement, and no opportunity has therefore been given to the Committee or to other persons to verify the accuracy of the answer. In the one case in which Mr. Tomes has given detailed particulars, viz., the Ethyl Chloride Fatality, it is submitted that the evidence given at the coroner's inquest and the particulars supplied to the Committee show that Mr. Tomes' statement is inaccurate and that he has confused the case in question with another case.

That with regard to Questions 2697 and 2698 and Mr. Matheson's answers thereto, that he would not dream of excepting ante-1878 practitioners who were registered from the administration of nitrous oxide gas, on the ground that the legislature would not legislate retrospectively, it is desired to point out that the Dentists Act, 1878, did not confer upon any person either the right to practise dentistry or to administer anæsthetics, but that the statute merely conferred upon certain individuals, viz., those who registered under the Act, the right to the use of the title Dentist, &c., the Act dealing with a right of title and not a right of practice, and that the right of the registered practitioner to administer an anæsthetic is only the same right as that of the unregistered practitioner, viz., the right conferred by the common law of the land, and common custom and usage.

That with regard to Question 2712 and the answer of Mr. Matheson, that the fact of a man being on the register shows that he has been educated and trained and examined in those things he sets out to perform for the benefit of the public is incorrect.

Out of a total of 4,994 persons registered in the Dentists Register for 1909 there are 2,043 who were registered on their own declaration that they were in *bonâ fide* practice of dentistry, without any additional qualifications.

Some of these persons were admitted as recently as 1901 upon making statutory declarations that they were in practice before 1878, although the Act provided that a person who wished to be registered upon such declaration must register himself before 1879.

The mere fact of registration affords no such guarantee as Mr. Matheson suggests, and the fact that registered dentists who are not qualified by examination are using the same designations as those qualified by examination, such as "Surgeon Dentist," or "Dental Surgeon," is calculated to mislead, and has, I am informed, been known to mislead the public as to the exact position of the so-called "Surgeon Dentist," who, although he may be, and in many instances is, well qualified to attend to the dental requirements of the public, yet holds no diploma, and has given to the authorities no proof of his qualifications either as a surgeon or a dentist.

That with regard to Questions 11,230 to 11,233 inclusive, I desire to point out that, in 1878, the practice of dentistry was not prohibited, but any person was free to practice, though he could not use the title dentist unless registered.

Numbers of individuals thought the advantage of using the title dentist was not sufficient to make it worth their while to spend the time and money necessary to qualify them, not necessarily for their profession, but to sit for examination entitling them to the degree of L.D.S., and as, in addition, when registered practitioners were subject to the jurisdiction of the General Medical Council and restricted in their advertisements, they preferred to forego the right to the title dentist, and this to a large extent accounts for the position to-day.

If the suggestions I have put forward were adopted, after 1911 no unregistered practitioner could administer an anæsthetic without breaking the law, and consequently the administration of anæsthetics by unregistered persons would be stamped out.

Further, if thought desirable, this prohibition could be extended to the practice of dentistry by the following provisions:—

Any persons not being registered under the Act or the Dentists Act, 1878, and not being a legally qualified medical practitioner who should practise dentistry or dental surgery, or perform any surgical operation in the human mouth habitually or for gain, should be liable to the same conviction and punishment as an unregistered person who administered an anæsthetic.

Any person or persons, or body of persons, using or applying a name, title, addition, description or designation to themselves or their work or the premises kept, used, or rented by them of dentist, dental practitioner or any other name, title, addition, or description, implying that they are qualified to practise dentistry, or that the practice of dentistry or dental surgery is carried on by them or at the premises referred to in the notification, should be liable on summary conviction to similar penalties.

Some exemptions should, however, be made in favour of persons engaged in *bonâ fide* practice at the passing of the Act. As I have suggested in paragraphs 3, 4, 5, and 6 of my Statement, in the event of the prohibition of the administration of anæsthetics, and such practitioners engaged in *bonâ fide* practice should be admitted to the Register upon the terms indicated and be subject in all respects to the provisions of the Dentists Act, 1878.

These provisions would not merely restrict the use of a title as did the Dentists Act, 1878, but would prohibit practice by unregistered practitioners.

In 1878 no proof was required that the applicant for regis tration was in *bonâ fide* practice, whereas the proofs I have suggested as to *bonâ fide* practice afford a guarantee that the applicant is a competent practitioner.

Moreover, as every practitioner would be subject to the

jurisdiction of the General Medical Conncil, if a few undesirable persons crept on to the Register they would soon be weeded out, as the attention of the various associations connected with the profession would be concentrated upon malpractices by the registered.

At the present time, according to my experience, these bodies pay more attention to the undesirables amongst the unregistered than to the black sheep amongst the registered.

STATEMENT of further Evidence of MR. FRED. BUTTERFIELD.

I am Secretary of the Incorporated Society of Extractors and Adaptors of Teeth, Ltd.

I have perused the Minutes of Evidence taken before the Departmental Committee.

I desire to call attention to certain questions put to Mr. C. E. Tomes, and to certain answers made by him which are incorrect and which were doubtless made under a misapprehension in consequence of his not having, as he stated, his papers with him.

In answer to Question 4179, page 151, Mr. Tomes stated that the figures of 1,249,167 cases was an unlikely figure, because in the whole number of years that the Dental Hospital in London has gone on, speaking without book, Mr. Tomes' impression was that was about the figure they had arrived at after about 40 years.

I desire to point out that the figures quoted relate not to one particular town, but to the whole of the United Kingdom of Great Britain and Ireland.

Mr. Tomes further made the following statement with regard to the one fatality under ethyl chloride referred to by me :—

"That is an instructive case for the present purpose, because at the inquest on that case the most gross ignorance was displayed by the man who had administered it as to the dosage, its effects, what it was and all about it. (Question and Answer 4179).

Further, Mr. Tomes stated :—

"If you refer to the evidence (I could have given you chapter and verse, only I came up at short notice), he displayed the most gross ignorance of its properties, dosage, and all about it—he knew nothing about it, in fact, judging from newspaper reports of the case." (Question and Answer 4180.)

Later on, in answer to Question 4207, Mr. Tomes said :—

"He did not think an unqualified person ought to be allowed for any operative purpose to administer general anæsthetics, even though he had all the experience of this particular Society we had before us, as in the only case that we know of we are aware that one of their body showed the most complete ignorance of

what he was about and of the agent he was using." (Question and Answer 4206 and 4207.)

"That was in the case of the death from ethyl chloride?—Yes." (Question and Answer 4208.)

SIR HORATIO SHEPHARD. "The Nottingham case?—Yes." (Question and Answer 4209.)

I say that Mr. Tomes is in error in saying either that the newspaper reports in that case, or the facts in that case, showed that the member of our Society displayed gross ignorance.

The member of our Society was Mr. Frederick Palmer, who then carried on practice at No. 1, Hounds Gate, but who, owing to the increase in his practice, has since been compelled to move to larger premises, situate at No. 8, Albert Street, Nottingham.

The name of the patient was Mrs. Eliza Ann Cope.

An inquest was held by the Coroner for Nottingham on the 6th March, 1907.

At this inquest Mr. Palmer was represented by Mr. C. E. W. Lucas, Solicitor, of Nottingham.

The British Dental Association, although they had no interest in the case and no *locus standi*, were represented by a firm of solicitors, Nottingham.

A copy of the depositions supplied by Mr. Rothera, the Coroner for Nottingham, and a newspaper report of the case, are submitted.

It will be seen from these papers that the case to which Mr. Tomes was referring was not the case of Mr. Palmer, who, as I have already stated, is the only member of our Society who has had any fatality while administering a general anæsthetic.

I therefore ask that, in justice to Mr. Palmer and our Society, these facts may be published.

If the Committee desire to question Mr. Palmer personally with regard to the matter, I will arrange for his attendance.

That with regard to Question and Answer 4216, I desire to point out that there is no justification for the statement that much mischief has been done by unqualified practitioners, especially in the Midlands and in the North.

If the Committee desire it, the Society could arrange for other members from other districts to speak as to the practice done by unregistered practitioners in the Midlands and in the North.

The witness withdrew.

TWENTY-EIGHTH DAY.

Friday, 19th November, 1909.

PRESENT:

SIR MACKENZIE CHALMERS, K.C.B., C.S.I. (*Chairman*).
SIR MALCOLM MORRIS, K.C.V.O., F.R.C.S.
SIR HORATIO SHEPHARD, LL.D.
MR. J. F. MOYLAN (*Secretary*).

Sir DONALD MacALISTER, K.C.B., M.D. (Camb.), examined.

11,243. CHAIRMAN.—You are President of the General Medical Council and Principal and Vice-Chancellor of the University of Glasgow?—I am.

11,244. And you are kindly going to tell us what has happened in the General Medical Council as regards instruction in anæsthetics?—With pleasure. I would mention first that, eight years ago, the Society of Anæsthetists approached the General Medical Council with a request that the administration of anæsthetics should be included in the schedule of compulsory subjects of instruction for medical degrees.

11,245. That was in November, 1901;—Yes. I should say, by way of explaining my reference to the schedule of compulsory subjects, that the General Medical Council has, strictly speaking, no power to require any particular subject to be included in the medical curriculum. Its statutory powers are to see that the course of study and the examinations to be gone through for the medical qualification are sufficient to guarantee the proficiency of medical practitioners in all branches of practice; but in order to secure that proficiency they have two powers. One is to inspect the examinations and to require information from the examining bodies as to what courses of instruction they prescribe; and secondly, if they are not satisfied with the answers as to the course of study, or if they are not satisfied with the standard of the examinations, they can report that to the Privy Council, and the Privy Council can then, if it sees fit, and if it is satisfied that the objections of the General Medical Council are sound, remove the qualification of that particular licensing body from the list of registerable qualifications.

11,246. It is an indirect power of compulsion?—It is an indirect power of compulsion. The natural method of following out the statutory instructions would be to be perpetually asking questions of the licensing bodies, and perpetually inspecting the examinations; and so, as a matter of convenience for the information of licensing bodies themselves, the Council has for many years been in the habit of drawing up a list of the subjects which it would regard as proper to be included, and has drawn

up also a list of regulations with regard to the standard of examinations that it would regard as sufficient. The licensing bodies in practice obey these recommendations because they are, as it were, a warning beforehand of what the Council will expect when the ultimate test comes to be applied. So that we call our suggestions recommendations rather than requirements; but they are recommendations with a sanction behind them. Strictly speaking, therefore, the Society of Anæsthetists, in approaching us and asking that certain subjects should be included among the compulsory subjects, were not speaking technically; but I wish you to understand that they were in effect speaking technically. The result is that we have drawn up a list of subjects that we consider should be included in every curriculum of medicine, in order that it may be regarded as coming up to the minimum standard. We have also made other recommendations, which we regard rather in the nature of desirable additions, and I presume that the Society meant that instruction in anæsthetics should be put in the first category and not in the second. As a matter of fact, at that time the curriculum was regarded as overloaded in the compulsory subjects. We had only recently introduced certain further changes in it, and the Council took the view that it was not expedient at that time to include instruction in anæsthetics as a separate subject among those which we would regard as compulsory in the sense I have explained. However, no doubt the standard of medical education has improved, and the requirements of the profession have advanced; so that in 1906 when the question came up, as it comes up periodically, for revising the recommendations of the Council, two things were quite spontaneously put in by the Council which had not been in before; one was practical instruction in anæsthetics, and the other was practical instruction in the methods of making *post mortem* examinations. Both of these had been implicity included in the general practice of surgery or the general practice of pathology, and now they were explicitly inserted on that occasion. These recommendations were then sent down to the bodies in the usual way, and were acknowledged by the several bodies. I should say that the bodies differ among themselves as to the rapidity with which they can make changes in their regulations. If you take such a body as the Royal College of Surgeons or the Royal College of Physicians in London, they can make changes in their regulations within a comparatively short time, because the regulations do not come under the head of byelaws or ordinances of the College, for which a superior sanction may be required, but they can be made on a recommendation of the Conjoint Board, and adopted probably at a subsequent meeting of the two Colleges after a very short interval indeed. The modification of their regulations is practically within their own hands. In the Scottish Universities the freedom is much less. The medical

curriculum there is laid down by an ordinance which has the force of an Act of Parliament, and in the case of the medical ordinance it prescribes very minutely what the several subjects to be included are, the duration of study, and so on; and the Universities within that ordinance have extremely little power of amending or altering.

. . . . . .

11,261. What is the number of the General Medical Council?—Thirty-four. I am not sure whether it is to be 35 to-morrow.

11,262. How are they divided into committees?—The Education Committee consists of a chairman, the president, and eight members. The Examination Committee is similar. They practically are continuous. They are elected from year to year, but they are always re-elected and vacancies are filled up as they occur, so that they acquire a considerable familiarity with the subject-matter that they have to deal with, and by a Standing Order they are required to report to the Council at each session on the matters committed to their charge.

11,263. The Council is elected of course from England, Scotland, and Ireland—from the whole of the United Kingdom?—Every University of the United Kingdom has a member, and every licensing corporation, such as the Royal College of Physicians and the Royal College of Surgeons and the Apothecaries' Society. The practitioners in the country resident in England and Wales elect three members at the present time; at the next election they will elect four. The practitioners in Scotland elect one and the practitioners in Ireland elect one; and then the Crown through the Privy Council appoint five.

11,264. It is a medical Parliament in fact?—Well it cannot legislate.

11,265. Except by recommendation?—Except in the fashion I have explained to you. But it has also a more important function. It is not exactly a parliament, it is a tribunal, because it can investigate charges against a medical man of unprofessional conduct and punish him if the case requires it, and a very large part of our time is taken up in penal work.

11,266. Am I right in saying that you not only prescribe the medical curriculum but the dental curriculum as well?—Yes; by the Dentists Act the Dental Register is placed under our charge, with somewhat similar powers to those we have with regard to the medical profession, but, being a more recent Act, certain improvements were introdnced into the procedure which make it somewhat easier for us to prescribe the curriculum in the case of dentists than it is in the case of medical men. And as you have asked the question, I may say that there has been no recomendation or requirement on the part of the General Medical Council that a dentist shall have received any instruction in anæsthetics. I mention that as a matter of fact.

11,267. I am going to ask your opinion presently on that subject. I think you have completed your statement as to the action taken by the General Medical Council in introducing instruction in anæsthetics as a subject of the medical curriculum?—That is my statement as regards the action taken by them in that matter. I may say that the Privy Council is in the habit of sending down to the General Medical Council for its opinion on all matters affecting legislation or even administration which seem to touch upon the affairs committed to it, and that last year the Privy Council submitted to us a Bill in which one of the clauses—I think the first clause—was that only a medical practitioner should administer anæsthetics for any purpose.

11,268. SIR MALCOLM MORRIS.—Was that Dr. Cooper's Bill?—I think there was a proceeding one drafted by Dr. Hewitt; that came first, and then, I think, at the same sitting the other Bill was also before us.

11,269. CHAIRMAN.—Dr. Cooper's Bill was actually introduced into the House, was it not?—Yes but Dr. Hewitt's draft Bill was the first. The first clause of that Bill, if I remember rightly, was as I have stated. The General Medical Council expressed instantly the opinion on that first clause, that they would very much desire to see a similar provision extended to all other branches of other medical practice. With regard to the second part, which proposed to make instruction in anæsthetics by Act of Parliament compulsory on all teaching bodies, the General Medical Council raised the difficulty that it seemed to be superseding the duty of the General Medical Council, and ultimately of the Privy Council, because the Privy Council, I ought to say, can, under the Medical Act, do anything which the General Medical Council ought to do and has failed to do. For that reason we took objection to the supersession, in one small point of medical practice, of the powers which were given to us for general purposes, and of a very wide scope.

11,270. And, having regard to what has been practically done, you think that sufficient provision is now made, without the compulsion of an Act of Parliament, for securing the proper teaching of anæsthetics?—That was the deliberate opinion of the General Medical Council, and I may say that it is my opinion. We believe that the powers which the General Medical Council possess, exercised as they are, are sufficient to secure that any branch of practice which gradually aquires sufficient importance shall be made part of the curriculum, and that we have the means of supervising the manner in which that instruction is required to be given and for the testing of the examinations by which it is tested. In the Bill as proposed there was no means either of punishing a defaulting licensing body which refused to obey the Act, nor was there any means of

securing that they carried out the duties imposed by Act of Parliament in other than a perfunctory manner.

11,271. Like a good many other Bills enacting a fine principle but with no machinery to carry it out?—Precisely. The General Medical Council answered that we had the machinery, that we have, we believe, the power, and that we believe that this particular branch of practice will be dealt with as others have been, better that by a separate Act.

11,272-4. May I take it that the General Medical Council generally are impressed with the importance of teaching the administration of anæsthetics? — Yes, you may take that certainly; this resolution was carried unanimously.

11,275. I suppose one is right in saying that day by day the field of surgery increases, and that as the field of surgery increases the necessity for skilful anæsthetisation also increases? —That is perfectly correct. I take it that it is that fact that has caused the changed attitude from 1901 to 1909. The importance of such instruction has become apparent to everybody.

11,276. Sir Malcolm Morris.—Is not a new form of anæsthetic coming up which is outside the scope of what is at present contemplated in the proposed legislation?—That is so; and one reason against laying it down by Act of Parliament, as a necessary condition of obtaining a diploma, that a person should have had instruction in the present form of inducing anæsthesia, would seem to be that it would be ignoring the possibility of a complete advance in the science which would make the requirement obsolete and would leave the door open for new forms of anæsthetic which could not be controlled by that Act of Parliament. The General Medical Council, on the other hand, can follow the advance of science and change its regulations as need may arise.

11,277. Chairman. — You have a flexible machinery whereas an Act of Parliament is rigid?—Yes. I ought to say that the resolutions of the Council with regard to that draft Bill, which I had better perhaps call Dr. Hewitt's Bill, and with regard to Dr. Cooper's first Bill, were transmitted to the Privy Council, having been adopted by the General Medical Council.

11,278. Will you kindly tell us what those resolutions were?—They are as follows:—"I. The General Medical Council has consistently endeavoured to safeguard the interests of the public in matters relating to the practice of medicine. They will, therefore, willingly support any measure which has as its object to render illegal the practice, save by duly qualified and registered medical practitioners, of any Department of Medicine and Surgery, including the branch of practice to which special reference is made in the communication from the Privy Council, viz., the Administration of Anæsthetics. II. The Council has within the last year issued a 'Recommendation' to the licensing

bodies that a course of study in the administration of anæsthetics should be included in the curriculum; and they have reason to believe that the 'Recommendation' has been already given effect to by many of the bodies." Then with regard to the communication which the Privy Council sent to us in relation to the draft Bill, I may state that on July 1st, 1908 the Privy Council, referring to the suggestion that had been made that the administration of anæsthetics should be restricted by legislation to duly qualified and registered men, observed that such legislation would have little value unless proper training in this branch of practice were provided, and inquired whether the effect of the Medical Council's action would be to include a course of the study in the professional curriculum. The Privy Council was informed that a large number of the teaching bodies had already taken the action recommended, and that it might, in the President's opinion, be confidently expected that in due time all the bodies would make instruction in the subject a requirement for their licence. In August, 1908 the Privy Council forwarded, with a request for observations, a copy of the General Anæsthetics Bill, 1908, which proposed to render it a penal offence for anyone not a legally registered practitioner to administer anæsthetics, and required all licensing bodies to examine in the subject. It was pointed out by the President, in reply, that such legislation would mean the virtual supersession of the General Medical Council, whose statutory function it was to secure the efficiency of examinations and to maintain the standard of proficiency in the several branches of practice. He held that there was no doubt that the power of of the Council to make recommendations to the licensing bodies, and its power to report to the Privy Council on the results, would be sufficient to effect the purpose desired. The Executive Committee, after considering this correspondence, on November 23rd, 1908, passed the following resolutions:—"(*a*) That the Memorandum and proposed Bill be reported to the General Council, with the statement that the Executive Committee approve the terms of the President's reply dated September 3rd, 1908, addressed to the clerk of the Privy Council; and the recommendation that the Council should inform the Lord President that the Council approve the principle of the first clause of the proposed Bill, but is unable to support the provisions to which objection is taken in the President's letter. (*b*) That the Registrar be directed to communicate with the Licensing bodies, calling their attention to the recommendation of the Council of May 30th, 1907, and inquiring how far they had given effect to this recommendation by requiring students to produce evidence of having received practical instruction in the administration of anæsthetics." These resolutions were reported to the Council on November 28th, 1908, when the Council directed the Registrar to inquire of all licensing bodies how far they had given

effect to the resolution of the Council as to practical instruction in anæsthetics, and the answers received from the bodies showed that nearly all of them had already taken steps in regard to the matter, and that before admission to their final examinations, candidates would be required to produce satisfactory certificates of instruction. On April 3rd, 1909, the Privy Council transmitted a copy of a Bill on this subject introduced into the House of Commons by Dr. Cooper, with a special inquiry whether clause 5 should not be made to cover all properly qualified dentists. The President pointed out in reply that the Memorandum attached to the Bill showed that the intention was to prevent the administration of anæsthetics in future by any but duly qualified medical practitioners. The clause in question merely reserved their existing practice to dentists already registered. The intention of the Bill would be frustrated if dentists hereafter registered were also included. The Executive Committee thereupon submitted the following recommendations for adoption by the Council:—"(*a*) That in the opinion of the Council the administration of general anæsthetics for the purpose of producing unconsciousness during medical, surgical, obstetrical or dental operations or procedures should in future be restricted to persons possessing a medical qualification. The Council further express the opinion that clause 4 of the Bill, as at present drawn, creates and imposes a serious penalty for an offence whose precise nature is not sufficiently defined. (*b*) That the Registrar's summary of the answers from the Licensing Bodies be referred to the Education Committee for consideration and report to the General Council." On May 29th, 1909, the General Council appointed a Committee to consider the proposals for legislation on the subject of anæsthetics which had been, or might hereafter be, put forward and to report to the Council on the subject at the next session, beginning on November 22nd. Then came a new point. We had given our general answer on Dr. Cooper's Bill to the effect that we should desire first of all that all branches of medical practice should be limited to medical practitioners; secondly, that we deprecated special legislation for anæsthetics; and thirdly, that we deprecated the creation of an offence which it was proposed to create, namely, the signing of a death certificate in the case of any person who died under the influence of an anæsthetic; we deprecated the making of that a penal offence on the ground that it was so ill-defined that medical men would not know where they were. "Dying under the influence of an anæsthetic"—does that mean under the knife or by reason of the anæsthetic, or within an hour afterwards, or by reason of shock, or anything of that kind? On that ground, that it was creating an offence the limits of which no medical man could understand, we thought that a recommendation contrary to that should be made. That completed our answer with regard to Dr. Cooper's Bill. Then

subsequently the clerk to the Privy Council asked us a question to which we have not yet given a final answer. In that Bill it was proposed that dentists registered up to the passing of the Act and medical practitioners at all times might administer anæsthetics. The implication was that dentists registered after the Act should not give anæsthetics. That was referred to the Executive Committee of the Council, consisting of nine members, which has in fact practically the charge of the business between the sessions, and they said that there was in their minds no doubt as to the answer to be given to it. They did not know that a question of principle was being raised ; they thought that the clerk to the Privy Council wanted to know the meaning of our answer on the previous communication. We had answered that the Memorandum attached to the Bill showed that its whole intention was ultimately to limit the administration of anæsthetics to medical men, and therefore that to remove the limitation to dentists registered before a certain date would be to destroy the purpose of the Bill. We did not understand him to ask us whether it was wise to remove that limitation and we did not think we were bound to give an answer on that point. But it turned out that he wanted to know our mind on the question whether dentists at all times as well as medical men at all times might by law continue to give anæsthetics as they had done. At any rate the Executive Committee had no doubt, and they recommended the Council to pass this resolution and send it to the Privy Council: "That in the opinion of the Council the administration of general anæsthetics for the purpose of producing unconsciousness during medical, surgical, obstetrical, or dental operations or procedures should in future be restricted to persons possessing a medical qualification." In other words, they endorsed the principle of the first Bill.

11,279. SIR MALCOLM MORRIS.—Is a dental qualification included under a medical qualification ?—No, they are two distinct things. One is under the Medical Act and the other is under the Dental Act. Each with a separate curriculum, separate examinations, and separate registration. But a medical man is, of course, entitled to perform all dental operations, as well as others. I ought to say, however, that when that resolution of the Executive Committee came before the General Medical Council it came near the end of a long and wearisome session and it was not adopted or rejected, but it was thought to be desirable that it should be thoroughly well considered before it was sent to the Privy Council ; and so I think on the last day of the Council meeting, at my own suggestion, a committee was appointed to consider it more carefully and to report to the next session.

11,280. And they are considering it ?—Yes, and they will meet on Tuesday, and probably report next week as to what their opinion is. We have not taken an opportunity of meeting before,

although it was contemplated, because we got a communication from the Privy Council saying in effect that there was no hurry, that the Bill was not likely to come before Parliament again this session; so we thought it would be advantageous to take the opportunity of a full meeting of the Council to consider it in all its bearings. At that committee meeting it is possible that this suggestion of the Executive Committee may be modified,—I cannot tell.

11,281. Is it fair to ask your individual opinion and some questions relating to it?—Quite. I have studied the subject.

11,282. Would you draw any distinction between nitrous oxide, which on the whole is a very safe anæsthetic, and the more durable anæsthetics, such as chloroform, ether, and ethyl chloride? Would it be possible that dentists should be allowed to administer nitrous oxide but not the more durable anæsthetics, which involve certain complications;—I would put my answer in this way—that there is much more to be said in favour of dentists giving nitrous oxide than in favour of their giving any other anæsthetic; but to my own mind there are two serious difficulties which have to be surmounted. The first is that in so many cases the anæsthetist is also the operator.

11,283. That I think everybody agrees is most objectionable?—It can be avoided and it should be.

11,284. Sir Malcolm Morris.—You express the opinion that it is undesirable?—It is undesirable for this reason, that many things may happen to a patient in a state of unconsciousness which require close observation to prevent them from becoming urgently dangerous, and that an operator who is occupied with his operation cannot exercise that watchfulness which is necessary to prevent the patient falling into danger.

11,285. Chairman.—That applies equally to medical men as to dentists, does it not?—It is very rare for a surgical operation to be conducted by a man who also gives the anæsthetic.

11,286. Sir Malcolm Morris.—But it does occur occasionally in country cases; I have done it myself?—I am not speaking of emergencies.

11,287. Chairman.—For instance, in what we may call a field operation. But dentists' operations are not sufficiently urgent in your opinion?—I do not think that a dental operation is sufficiently urgent to justify running that risk. In the case of a surgical operation in an emergency you must do it. That is one objection that I feel. The other is that if an accident occurs it requires medical skill to know what is wrong and medical skill to know how to treat it, if it is to be remedied in time, and neither of those qualifications does a dentist as a dentist possess. For example, the tongue falling back, or blood going into the throat, stoppage of the heart or respiration may require an injection of strychnine, or it may require immediate measures

applied to the circulation. It may even require tracheotomy. None of these things is a dentist as such qualified in the first instance to determine, if there is no one else there, and secondly to treat when once he has determined them. Those are the two difficulties that have to be surmounted.

11,288. But supposing that the administration of nitrous oxide—confining it to that—was made part of the dental curriculum and that there was something in the nature of a byelaw prohibiting the same man from administering the anæsthetic and operating, would you see any objection to dentists continuing, as they have done, to give nitrous oxide?—That would limit the preventable dangers very greatly. It would not finally remove my difficulty as to dentists being obliged in an emergency to perform medical or surgical operations, which they have not been trained to perform.

11,289. But so far as the evidence before us goes, with nitrous oxide those emergences are so exceedingly rare that they are hardly worth taking practical account of?—They are not very common. I am speaking from the theoretical point of view.

11,290. As a counsel of perfection, so to speak?—Yes.

11,291. But it would be a serious practical detriment to dentists, would it not, if they were not allowed to give gas?—I think there is no doubt of that.

11,292. Sir Malcolm Morris.—Where there are two partners in a small country town, one partner might give gas for the other?—Yes. If you insisted that for every operation where unconsciousness was produced two qualified dentists should be present, I think the greater part of the danger would be met—not the whole of it. I have said already that tracheotomy might have to be performed.

11,293. Chairman.—I think Dr. Hewitt told us that in all the anæsthetics he has given, he has only once had to do tracheotomy, and that was not nitrous oxide?—But you see it might be your case or mine that was the next one.

11,294. But you can hardly legislate for a one-per-million chance?—I should like to do so if I could.

11,295. Sir Malcolm Morris.—I should like your opinion on this particular point. Supposing that two men are partners and one is a qualified dentist and the other is not, and the qualified dentist does the operation, is it unjustifiable for the non-qualified dentist to give the anæsthetic?—The General Medical Council has a strong view on that point, and so far as it can legislate it has prohibited a medical practitioner from giving anæsthetics for an unregistered dentist, regarding that as covering unqualified practice.

11,296. It would equally cover the other case?—It would cover the other case more strongly. If he is permitting an unregistered person, by his presence and his co-operation, to pose as

if he were a qualified person, we regard it as a professional offence, on the ground that it is fraudulent to the public; and we have successfully prosecuted and punished medical men who persistently covered unqualified dentists by administering anæsthetics for them.

11,297. CHAIRMAN.—There is no doubt whatever in your mind or that of anybody else, I suppose, that intraspinal administration of anæsthetics ought only to be done by a qualified medical man?—There is not the faintest doubt of it—and a highly skilled medical man—until it is more familiar than it is at present.

11,298. I suppose the General Medical Council are clearly of opinion, as regards unqualified people (excluding dentists and medical men) that no general respirable anæsthetic ought to be administered by them?—They regard it as highly objectionable in the interest of the public.

11,299. As the law stands at present, any member of the public may administer an anæsthetic to any other member of the public without let or hindrance, provided that he does not intend to commit a criminal offence?—Or he can perform any surgical or medical procedure—even amputation.

11,300. There is nothing to prevent, for instance, a beauty doctor administering anæsthetics?—No, there is nothing to prevent an unqualified person administering any drug, so long as it is not for a felonious purpose.

11,301. One Englishman may not sell a glass of beer to another, but he may drug his friend to his heart's content?—Yes, and perform any surgical operation. I do not know whether it would come under the common law as mayhem.

11,302. I should think he would consult the patient before that?—That is the state of our law, and in this country we are almost unique among the nations of the world in that respect.

11,303. The Scotch law as well as the English law?—Yes, the Medical Act extends to Scotland.

11,304. There is no prohibition in Scotland which is not in force in England as regards drugging or anæsthetics?—That is so; but the same is not true of the larger Dominions and Colonies that have laws restricting unqualified practice, some of which are of a very admirable kind. Among the nations of Europe I believe I am right in saying that only Great Britain, Germany, and Turkey have no law on the subject.

11,305. SIR MALCOLM MORRIS.—It is no part of the function of the General Medical Council to consider the various kinds of anæsthetics and how they are administered?—No, except as the *British Pharmacopœia* authority.

11,306. CHAIRMAN.—I suppose that your practice has been always that of a physician?—I was physician to Addenbrooke's Hospital at Cambridge for about twenty years.

11,307. Are there any points on the subject of anæsthetics that you wish to bring before us from the point of view of a physician?—None, I think.

11,308. We have been told—I do not know whether you have considered the matter—that in Scotland chloroform is used almost to the exclusion of ether?—That is so.

11,309. That in America ether is used to the exclusion of chloroform and in England ether is very largely used?—Gas and ether, and for children and so on, chloroform.

11,310. Have you any notion as to how the divergence of practice has sprung up?—I think partly from historical reasons.

11,311. In connection with Sir James Simpson?—Yes. Chloroform was studied most intensely in Scotland because it was introduced there under Sir James Simpson, and probably they have therefore acquired a knowledge of its qualities and its dangers which makes them prefer what they know best. In America ether, of course, was introduced in Boston a hundred years ago and they have become more familiar with its qualities. In England they are more eclectic, and the individual preference, I think, in England counts for more than the teaching of a particular school. In Scotland, schools like those of Edinburgh and Glasgow, where great men have taught, have caused a particular practice to pervade the country. There has been less individual concentration of influence in this country; in the different schools there are different ways and their pupils follow them, and so there are different practices throughout the country.

11,312. What is your opinion as to the relative safety of the Scotch and English methods?—I should say that chloroform is safer in the hands of a Scotsman, and ether in the hands of an Englishman; and I believe that that is owing to more than a mere national preference; it is that they actually know better what to look out for in Scotland as regards chloroform.

11,313. It has been a traditional anæsthetic with them?—Yes, and the dangers of it are carefully inculcated to medical students.

11,314. SIR MALCOLM MORRIS.—Do you agree with Dr. Waller that it is very largely a question of accuracy of dose?—Yes, safety is very largely a question of accuracy of dose.

The witness withdrew.

NOTE.—*Subsequently to giving evidence, Sir Donald MacAlister forwarded the Report of the Anæsthetics Committee, which was appointed by the General Medical Council on May 29th, 1909, to consider the proposals for legislation on the subject of Anæsthetics which have been or may hereafter be put forward, and which had before it the Anæsthetics Bill, 1909. The Report was adopted by the*

General Medical Council on November 27th, 1909, and contained the following conclusions and recommendations :—

CONCLUSIONS.

1. That the statutory powers with regard to medical education exercised by the Council, and in the case of need exercisable by the Privy Council, are sufficient to secure that candidates for medical or dental qualifications shall have received adequate practical instruction in the administration of anæsthetics, and that the Council has already taken steps, and is prepared to take further steps, to secure the end in view.

2. That it is inexpedient to provide by Act of Parliament that evidence of such instruction should be raised to the status of an "additional qualification," without which no person shall be entitled to registration.

3. That in the exercise of its statutory powers with regard to medical education the Council is enabled to take account from time to time of the advances of medical science in regard to the methods of procuring anæsthesia, and to vary its recommendations to the licensing bodies accordingly, in a manner which would not be practicable under the terms of the proposed Bill, should that pass into law.

4. That it is desirable in the public interest that the administration of anæsthetics for the purpose of inducing unconsciousness or insensibility to pain during medical, surgical, obstetrical, and dental operations or procedures should be restricted by law to duly qualified medical practitioners, due provision being made for the practical instruction of students, and for cases of emergency.

5. That having regard to existing conditions it is also desirable in the public interest that duly qualified dental practitioners should be authorised to administer certain specified anæsthetics, such as nitrous oxide gas, for the purpose of inducing unconsciousness or insensibility to pain during dental operations or procedures, due provision being made for the practical instruction of dental students.

6. That the specification of the anæsthetic substances or drugs which may thus be employed by duly qualified dental practitioners during dental operations or procedures should be made in a schedule to the proposed Act of Parliament, power being reserved to the Privy Council, on the recommendation of the General Medical Council as the authority charged with the publication of the *British Pharmacopœia*, to add to or vary the specified list from time to time as occasion arises.

7. That it is expedient in the public interest to provide that the person who administers the anæsthetic for the purpose of inducing unconsciousness during any medical, surgical, or

dental operation or procedure, should not be the person who performs the said operation or procedure, due provision being made for cases of emergency.

8. That it is inexpedient to create, as proposed in clause 4 of the Bill, a new penal offence the precise nature of which is not defined, inasmuch as the words "dying while under the influence of an anæsthetic" are capable of several interpretations, varying with the circumstances of each particular case.

9. That if it should be deemed desirable to make provision for duly recording the cases contemplated in clause 4, a system of notification to the proper authorities, similar to that which is applicable to births, or to infectious diseases, would be sufficient for the purpose.

10. That for the present it should be left to the licensing bodies to determine the precise form of the evidence of "adequate practical instruction in the administration of anæsthetics," which they require to be produced by candidates for their medical or dental qualifications.

11. That the following addition should be made to the Council's Recommendations on dental education and examination, namely:—

"(v) (*e*) Administration of the anæsthetics usually employed in dental practice."

RECOMMENDATION.

The Committee recommend that the foregoing conclusions be adopted by the Council and transmitted to the Lord President of the Privy Council for his information.

DONALD MacALISTER,
Chairman.

November 25, 1909.

The memorandum and text of the Anæsthetics Bill, 1909, are as follows:—

ANÆSTHETICS BILL.

Memorandum.

The object of this Bill is to require a medical practitioner or a dentist applying for registration on or after January 1, 1912, to submit evidence of having received practical instructions in the administration of anæsthetics, and to prohibit any person not a registered medical practitioner or a registered dentist administering an anæsthetic except under certain conditions. To prohibit any certificate of death being given in the case of any person dying under an anæsthetic.

Arrangement of Clauses.

Clause.

A BILL to regulate the administration of Anæsthetics.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows :—

1. On and after the *first day of January, one thousand nine hundred and twelve*, no person shall be registered under the Medical Acts or the Dentists Acts in respect of any qualification referred to in any of those Acts unless he shall have produced evidence that he has received theoretical and practical instruction in the administration of anæsthetics.

2. Any person not a registered medical practitioner or a registered dentist who shall adminster or cause to be administered to any other person, by inhalation or otherwise, any gas or vapour, or drug or mixture of drugs, solid or liquid, with the object of producing unconsciousness during any medical or surgical operation, examination, act or procedure, or during childbirth, shall be liable on conviction before a court of summary jurisdiction for such offence, to a penalty not exceeding *ten pounds*, and in the case of any subsequent conviction, to a penalty not exceeding *twenty pounds* : Provided that a person shall not be liable to a penalty under this section if in conducting such administration he was acting under the immediate direction and supervision of a registered medical practitioner or a registered dentist, or if the circumstances attending the administration were such that he had reasonable grounds for believing and did believe that the delay which would have arisen in obtaining the services of a registered medical practitioner or a registered dentist would have endangered life.

3. Power is hereby given to the General Council to make any regulation or order to carry out the requirements of this Act.

4. Any registered medical practitioner who gives a certificate of death in the case of any person dying while under the influence of an anæsthetic shall be liable, on summary conviction, to a penalty not exceeding *five pounds*.

5. Offences under this Act may be prosecuted and all fines recovered in manner provided by the Summary Jurisdiction Acts.

In the application of this Act to Scotland the expression "Summary Jurisdiction Acts" shall mean the Summary Jurisdiction (Scotland) Acts, 1864 and 1881, and any Act amending the same.

In the application of this Act to Ireland the expression "Summary Jurisdiction Acts" shall mean a court of summary jurisdiction constituted in the manner mentioned in the two hundred and forty-ninth section of the Public Health (Ireland) Act, 1878.

6. The expression "Medical Acts" means the Medical Act, 1858, or any amendment of that Act.

The expression "Dentists Acts" means the Dentist Act, 1878, or any amendment of that Act.

The expression "General Council" means the General Council of Medical Education and Registration in the United Kingdom.

The expression "registered medical practitioner" means a person registered under the Medical Act, 1858, or any amendment of that Act.

The expression "registered dentist" means a person registered under the Dentists Act, 1878, or any amendment of that Act.

7. This Act may be cited as the Anæsthetics Act, 1909.

Mr. J. Frederick W. Silk, M.D. (London), M.R.C.S., examined.

11,315. Chairman.—For the last 16 years I think you have been Senior Anæsthetist and Teacher of Anæsthetics at King's College Hospital?—I have.

11,316. And for 10 years you held a similar position at Guy's Hospital?—That is so.

11,317. And you have been anæsthetist to other hospitals, and you are a past president of the Society of anæsthetists?—That is so.

11,318. For the last quarter of a century, I think, you have practically devoted your whole time to the subject of anæsthetics?—I have.

11,319. And you have kept records, you tell us, of 17,000 cases?—I have got records of upwards of 17,000 cases in my own notebooks, apart from my hospital work.

11,320.—Are these cases in which you yourself have seen the anæsthetic administered, or only cases that took place in your hospitals?—No, they are cases in my own private work which I have absolutely done myself.

. . . . . .

11,338. Sir Malcolm Morris.—Do you think that the public have no right to any public inquiry into a death occurring during anæsthesia?—No more than into a death occurring during an operation.

11,339. In your experience has any harm to the public resulted from the fact of the publicity?—I believe myself very strongly that a great deal of the excitement and trouble which has arisen in respect of the administration of anæsthetics is due to the publicity, and that one element of danger in the administration of anæsthetics is funk on the part of the patient, who then comes upon the operating table in the very worst possible condition.

11,340. And you attribute that to a great extent to the great publicity with which inquests are frequently held?—I think that is an element. I do not want to overburden the point, but I believe that that is a distinct element in increasing the trouble.

11,341. Chairman.—As a practical anæsthetist you say that the danger is increased by the apprehension of the patient?—Yes.

11,342. And that that apprehension of the patient is liable to be increased by publicity being given to these cases?—Certainly.

11,343. It is not the fact of the inquest but the reporting of the inquest that is a dangerous thing as regards the patient?—Yes, so far as the patient is concerned. But I object to an inquest in such cases, even if it is not public.

11,344. Sir Malcolm Morris.—Would you have any objection to the coroner inquiring into the question, even if he does not hold an inquest?—No, providing always that there is not the aspect which is my serious objection to the coroner holding an inquest.

11,345. Not an inquest; he is to make a preliminary inquiry?—Yes, provided that it does not mean that he is putting the man on his trial in any way.

. . . . . .

11,362. It is quite conceivable that there may have been carelessness in an operation and that the patient may survive, say, for 24 hours?—Quite so, but then you see another important point arises: there is a condition known as post-chloroform poisoning which does not show itself until 24 hours. The patient in the interim is apparently well; he then becomes acutely ill and dies.

11,363. From sudden heart failure?—No, the chloroform sets up an acute fatty degeneration of the liver. Are you going to inquire into those deaths?

11,364. You can inquire, but the answer would be that nobody was to blame?—Exactly.

11,365. Sir Horatio Shephard.—Is that due to an overdose?—No.

11,366. Chairman.—Is it idiosyncracy on the part of the

patient?—Yes. I am merely putting it forward as indicating difficulties that arise when once you begin to suggest that there should be an inquest into every case, because the cases involve so many complicated questions: the question of the operation, the question of chloroform, the question of the condition of the patient, and so on.

. . . . . .

11,370. SIR MALCOLM MORRIS.—Take the case of status lymphaticus. Without a post-mortem examination no one would know what the death was from?—No, and they do not always find out now.

11,371. With your experience in all these years do you, looking back now, think that any deaths can have been due to it without your knowing it?—It is quite possible, I think. But with regard to status lymphaticus, I think the general feeling is that there is no doubt that it is a pathological entity, but it is doubtful what exact bearing it has upon the cause of death either in that or in anything else. Curiously enough the condition was brought forward to explain cases of people dying suddenly in the street, not to explain anything in connection with anæsthetics at all; it has only been applied to that since.

11,372. CHAIRMAN.—But if a person is in a condition in which he is likely to die suddenly in the street, the administration of an anæsthetic is liable to conduce to that result there and then?—Yes, and equally if it was known that he was in a condition in which he was liable to fall down in the street he would not be allowed to go out in the street. But the thing is that you do not know it.

11,373. To come to your next point, there is only one question that I want to ask you about it. You say that you think that the Committee hardly want any more evidence as to the action and methods of administration of the various anæsthetics; but I should like to ask you after your long experience, whether you have any opinion on a point on which we have had conflicting opinions given to us. Some witnesses have told us that the way of safety lies in keeping the anæsthesia light just beyond the point of analgesia. Others have told us that if you keep the anæsthesia light, although the patient may be absolutely free from pain, the danger of surgical shock is not removed if the operation is a serious one, or it is an operation involving a a large number of nerves. What is your opinion with regard to that point?—I should be inclined to say that it is a case of being midway; that if the anæsthesia is too deep the tendency to shock is increased, just as much as if it is too light the tendency to shock is increased; so that the point that the anæsthetist always tries for is to get the intermediate condition, in which the shock is as little as possible, so far as the anæsthetic is concerned, either one way or the other.

11,374. That opinion of yours brings us to another rather difficult question. I suppose that this happy medium stage, this golden mean, depends entirely on the skilled eye of the anæsthetist?—Yes, it does depend very largely on that.

11,375. You can hardly teach that theoretically to people?—No, I do not believe that you can.

11,376.—Because you see little minute changes which would mean nothing to a man who was not continually and daily administering these anæsthetics?—It is not so much, perhaps, a matter of skill as it is very largely a matter of teaching. In teaching my students I always make a point of insisting that they should closely apply themselves to what they are doing and not look at anything else. I believe that if you could get all men to do that, you would avoid many accidents and deaths.

11,377. The whole attention ought to be on the anæsthetic?—Yes,

11,378. Not on watching an interesting operation?—No, he need not be a very clever man, but he does need to be a man with a power of watchfulness, and quick observation.

11,379. And you think that a good deal of that can be taught?—I think a good deal of it can be taught.

11,380-2. Do you agree generally with Dr. Waller's evidence as to the immense importance of the dosage?—Yes, but with this reservation, that I think you have got to regulate your dose according to your patient. You have not got to regulate your dose according to your percentage scales standing up against the wall, because what is poison to one person, say two per cent. or say 0·5 per cent., or whatever percentage you take, is perfectly safe to another.

11,383. Sir Malcolm Morris.—Can you say what guides you, so far as the patient is concerned?—Variations in breathing mainly, and colour, and the general condition of the patient.

11,384. Chairman.—The signs of which are apparent to a skilled anæsthetist?—Yes.

11,385. And which no mechanical teaching and no mechanical apparatus will supply?—That is so.

11,386. Sir Malcolm Morris.—Have you any statistics at all as to the proportion in this country of anæsthetics given by specialists who have been trained and by ordinary members of the profession, who have knowledge, but not special training?—No, I have not, and I cannot think where you could get anything of the kind.

11,387. There must be an enormous number of anæsthetics given every day in this country by men who are qualified to do it, but who are not trained anæsthetists?—Sir Donald MacAlister pointed out just now, and I was very pleased indeed to hear him say so, that gradually the schools are coming into line as to the necessity for instruction in anæsthetics.

11,388. But there is a vast difference between the minimum qualification and training?—Yes, but there is a still greater difference between a man who has received absolutely no instruction in anæsthetics and a man who has received some instruction in anæsthetics.

11,389. CHAIRMAN.—May I put it in this way: I understand you to say that by proper teaching you can teach a man how to avoid the common accidents, the accidents that occur nine times out of ten?—Yes, and what to do when they do occur.

11,390. In nine cases out of ten?—Yes.

11,391. Or even a larger proportion?—Yes.

11,392. SIR MALCOLM MORRIS.—I did not get to my point. The point of my question was as to the percentage of trained *versus* ordinary practitioners, as to whether there was a larger proportion of deaths and accidents with the latter class?—Some years ago I wrote a paper on the subject, in which I endeavoured to show that of the deaths a larger proportion occurred at the hands of young men than at the hands of the more experienced; and I went further than that, and endeavoured to point out that they occurred at the hands of men who came from schools where we knew there was no teaching in anæsthetics.

11,393. Therefore training and skill count?—They do count.

11,394.—Therefore no mechanical method can take the place of training and skill?—I agree with you.

. . . . . .

11,405. Then another point arises on these returns. We have no figures whatever to show the ratio between the number of deaths and the number of operations?—None whatever.

11,406. Can you help us in that matter?—In a letter that I wrote to the papers I made a very rough approximation. I first of all took the number of administrations in two hospitals—King's College Hospital and the London—in one year. I then went through the Medical Directory, and looked out all the public hospitals in England alone where operations were likely to be performed, with the number of beds that they had, and I made an approximate estimate on that basis. The conclusion that I then came to was, that in England alone the administrations were very many more than I had anticipated; I put them down at half a million a year. But even that is very much under-estimated, because I did not take into account nitrous oxide cases. According to Mr. Matheson, who gave evidence here, he put the latter at not less than 2,000,000 per annum for dentists alone. But that is a very rough estimate, and it is merely an indication of what an enormous number of administrations there must be.

11,407. Of the longer anæsthetics, such as chloroform and ether?—Yes, a very large number.

. . . . . .

11,413. CHAIRMAN.—So that an enormous number of lives are saved although a certain number of lives are lost?—Yes, I think that is without question. I should like to emphasise the fact with regard to the difficulties of figures that it is not only difficult to arrive at the number of administrations, but it is absolutely impossible to arrive at any idea of what number, if any, of deaths are due to what I may call unqualified agencies. We have absolutely no information upon the point. Allusion has been made to 13 cases in 21 years, 13 cases in 21 years I consider practically negligible.

11,414. SIR MALCOLM MORRIS.—Out of millions and millions of administrations?—Yes, you cannot put them at less than 10 millions.

11,415. CHAIRMAN.—If, then, Mr. Matheson's figures go over the same number of years, as they probably do, at least as many people have been killed by falling downstairs?—Yes. With regard to that again, it seems to me that if you are going to take the Registrar-General's figures as the basis of the increase in the number of deaths, I should like to point out that most of the figures registered by him are derived from registered practitioners. The unregistered practitioner does not, as a rule, approach the Registrar-General in any way; so that the increase in the number of deaths is due to an increase at the hands of qualified administrators, not of unqualified persons.

11,416. What is your remedy. Would you allow absolutely unqualified persons to administer anæsthetics if you could stop it?—I should be very glad indeed to stop it.

11,417. Would you draw no distinction between other forms of unqualified practice and the administration of anæsthetics?—Certainly not. It is suggested that if a bone-setter can call in his butler to give an anæsthetic, you should prosecute the butler, prosecute the servant, penalise the servant, but not the bone-setter. I cannot see why the distinction is made.

11,418. I cannot quite follow that.

SIR HORATIO SHEPHARD.—One is giving a direct poison and the other may be doing some operation.

SIR MALCOLM MORRIS.—But the one is giving it under compulsion.

11,419. CHAIRMAN. Let me put it in this way. If I, being a lawyer, recommend my friend, Sir Horatio Shephard, to take a particular pill, that is unqualified practice, but there is a very great difference between my doing that, saying you will find these pills excellent, and my giving him an anæsthetic and performing an operation upon him?—But with all due deference, your friend could not refuse to pay you your wages if your pill failed to act. That is the position. The bone-setter says to his butler, "You come and give an anæsthetic." "No," says the man, "I will not." Then the bone-setter says, "You must leave my service."

11,420. In that particular case. But surely there is a great difference between a man simply prescribing a drug—I am taking an unqualified practitioner—a chemist, say, who, when a woman comes with a bad cough and asks for a prescription, gives her a cough mixture and a man who gives her an anæsthetic and performs an operation upon her?—It is a question of degree; he is equally culpable. He may administer morphine or cocaine, cyanide of potassium, or some of the most poisonous drugs.

11,421. But surely putting a person into a state of absolute unconsciousness is a serious power to entrust to anybody who does not belong to a recognised profession and has had no training in the profession?—But you have no guarantee that he is more qualified to give anæsthetics if he is qualified. Sir Malcolm Morris's inquiries, I take it, were directed to elicit my opinion as to whether I thought it was a personal element came in in giving anæsthetics. I do think so. I think that many qualified practitioners are much less capable of giving anæsthetics than a man who is perhaps nominally unqualified.

11,422. That shows that you must legislate for general cases and not special ones?—Exactly. There is one other point with regard to that; I am very much opposed to partial legislation in this way. I agree with what the previous witness has said.

11,423. CHAIRMAN.—You think that no bread is better than half a loaf?—If one were certain of getting no bread at all, one would prefer the half loaf; but I think the whole trend of opinion at the present moment is that, with a little perseverance, we shall get some form of protective legislation. If a partial Act of this sort is carried, and it fails (and I believe it is foredoomed to failure), it would ruin the prospect of getting another Act through. That is the point I submit. I say that it is foredoomed to failure. Take the case of the Midwives Act. Although it is quite true that the Midwives Act is directed in the opposite direction, that is to say, to legalise unqualified practice, still the principle involved is the same: it attempts to legislate for a portion of medical practice (midwifery, to wit). In the annual report of the Council of the Royal College of Surgeons for 1909, Mr. John Ward Cousins says: "The Act came into operation on the 1st April, 1903, and up to the present time the results have been very unsatisfactory." That is an example of the fate which may befall special legislation.

11,424. You say that the whole matter of unqualified practice ought to be taken in hand and not only one branch of it?—Yes, most emphatically.

11,425. So that on the whole, you disapprove of the whole of Dr. Cooper's Bill, and not only of certain clauses in it?—Yes, I think, on the whole, it is very much the same as the

previous witness's suggestion with regard to education. He said that the General Medical Council had—as, of course, they have—already the power with regard to that; and with regard to other clauses of the Bill, you must provide for emergencies and other contingencies, and these would be so many doors open for evasion, And in none of the Bills as drafted are there any provisions whatever for machinery to put the Act into force, and I do not understand how it is to be put into force.

11,426. Of course, if you simply penalise an unqualified person for administering anæsthetics, it is like any other offence, anybody can prosecute; anybody who is aware of the facts can go to a magistrate?—That would surely lay the practice open to blackmailing.

11,427. That is, of course, the unfortunate result of any penal legislation?—It is, I quite admit. I thought that all legislation was objectionable in which the penalties were to be recovered by the man in the street, or where the Act was to be put in force by the man in the street.

11,428. It is the general rule of English law that anybody can prosecute for any offence?—Yes, and I should judge that the trouble with the Medical Act at the present moment is not only that it does not extend far enough, but that the machinery for putting its existing powers into force is not of a sufficiently far-reaching kind. It depends upon the opinion of a man's neighbours.

11,429. There is only one further question I want to ask you. You have been teaching anæsthetics for a long time; would you tell us what practical course you give to your students, and what you think is a sufficient practical course?—What we did at Guy's Hospital was: a certain number of students were attached to the anæsthetist, as "clerks to the anæsthetist," for, I think, two months at a time; they came with me to the dental extracting room, where I showed them how to give gas, and I made them give gas.

11,430-1. Under your supervision?—Under my supervision and direction. They entered all their cases on a form that I had made showing what they had observed. I would tell them what to observe; I would say, "You must see this, that, and the other, and go and put it down in the book." Then they did the same thing with regard to general operations in the operating theatre, and by that means we used to get through (there were two or three of us then, I think) a very large number of students and give them a great deal of instruction—actual personal instruction and personal experience—in the course of the year.

11,432. I was going to ask you, is it possible to get through the whole of the students?—That depends very largely upon the size of the school, and also upon the number of the anæsthetists.

11,433. Sir Malcolm Morris.—At the present day these operations are carried out with the greatest possible antiseptic precautions, as you know?—Yes.

11,434. And the desire is, so far as possible, especially in a difficult operation, say an abdominal operation, that there should be as few people as possible in the theatre?—Yes.

11,435. How are you going to get through all your students if you cannot take them in there to look on and to do it. Take King's College Hospital; with a bad operation going on, how many men could you have by your side learning the administration of anæsthetics?—With a bad abdominal operation going on one ought not to have more than one.

11,436. Then how can you work it all round the whole lot of your men in a year?—You may have six operations a day, and you may have a different man each time.

11,437. Can any men now get signed up and go up with a statement that they have had the instruction without their having it; is it possible?—Not from me.

11,438. Not from you. I am speaking generally.

11,439. CHAIRMAN.—We have to deal with medical schools all over the country?—I mean myself, in my anæsthetic work. You are inquiring now into a very large subject, that is to say, how is a medical student signed up?

11,440. I did not mean exactly to go into that. To put it in another way, is this recommendation of the General Medical Council one that can be practically carried out by the whole profession?—It can absolutely, I have no doubt.

11,441. Then before a man ought to practise, how many times ought he to have administered anæsthetics himself?—That is a very difficult question, because it depends so much upon the man.

11,442. Is there not a minimum? I quite agree that you cannot have a maximum; but is there not a minimum?—I should not like to fix it.

11,443. I was thinking that when a teacher has to certify that a man is fit to go up for his qualifying examination he must have some standard in his own mind?—Quite so.

11,444. But you cannot lay down an objective standard?—You cannot lay down an objective standard. It is the sort of thing that you must leave to the teacher, I think. I know that it has happened to me more than once, that if for some reason or another I was not quite satisfied with a man, I would make him do another month. You must send them back. You ought to have the power, and I think it is perfectly possible to do it.

11,445. A good deal can be done, I suppose, in lecturing; there are a good many theoretical points that men ought to know apart from mere practice?—I always have a course of lectures myself of about half a dozen every summer, and the men have to attend them. There are certain points that you must rub in, but then of course that is not so important as the question of practical work, standing by the man and seeing what he does.

11,446. Sir Malcolm Morris.—In smaller operations it is perfectly possible to give each man a training, but supposing you come to a big abdominal operation that lasts an hour and a half, every man cannot have a full training in that?—But does not that apply to all medical teaching altogether? A man is taught how to put up a broken leg, but he does not really become proficient in putting up broken legs until he has actually put up at least half a dozen. But you cannot give him half a dozen in his student days.

11,447. Sir Horatio Shephard.—There must be very few people who have gone through the whole course who are really fit to perform a big operation; you cannot expect it?—That, if I may say so without offence, is very often the difference between the skilled surgeon and one who is not; they all start about equal; or, at any rate, it is not merely a question of genius, it is a question of practice.

11,448. It might be of importance to know your opinion with regard to this point. Dr. Waller, as I understand, told us that it was possible on an analysis of the blood after death to ascertain positively whether the death was due to the anæsthetic —to an overdose of chloroform. That appears to have been his view. I should like to know what your view is?—I should certainly not like to say that it is impossible.

11,449. Chairman.—You would not like to give an opinion yourself?—No.

11,450. Sir Horatio Shephard.—The way in which I see he puts it is this: "My statement amounts to this, that if the turning-point registers more than 10 cc. of silver nitrate, there has been excess of chloroform in the blood"?—I daresay it is true. I would not like to say that it is not.

11,451. Chairman.—You would not like to act on it?—No.

11,452. Sir Horatio Shephard.—At any rate, you do not attach the same importance to the exact dose as Dr. Waller does? —To the exact dose *qua* the man, but not the exact dose *qua* the measure.

11,453. Chairman.—On that I take it that you would agree with another witness who told us that you may have any apparatus you like, but that you always want the individual care and attention—in fact, the human element?—Yes. If you introduce an apparatus you are very apt to introduce a distracting element which diverts the attention of the administrator from the patient.

11,454. And for the safety of the patient, I take it that you, as a skilled anæsthetist, would just as soon use the open method as any apparatus?—I would.

The witness withdrew.

STATISTICS OF ADMINISTRATION OF ANÆSTHETICS

In England, Ireland, Scotland, and Wales, by Members of the Incorporated Society of Extractors and Adaptors of Teeth.

Handed in by Mr. Butterfield. *(See Q. 2962.)*

1909.

ENGLAND.

County.	Number of Places in each County.	Population of County. 1901 Census.	Total Number of Administrations of Local Anæsthetics during 1908.	Fee charged for "Local."	Total Number of Administrations of Nitrous Oxide Gas for 1908.	Fee for Gas.	Number of Administrations of Local Anæsthetics since Members joined the Society.	Number of Administrations of Gas since Members joined the Society.	Fatalities.	Remarks.
				s. d.		*s. d.*				
Bedford	1	174,972	138	1 6	14	5 0	680	39	Nil	
Berkshire	5	283,531	8,547	2 6	1,478	5 0	12,734	2,139	Nil	
Buckingham	6	173,061	1,900	2 0	380	7 6	6,492	1,178	Nil	
Cambridge	14	200,680	6,678	2 6	4,314	10 6	95,310	45,008	Nil	
Cheshire	18	792,913	32,138	1 6	6,384	3 6	207,468	54,704	Nil	
Cornwall	12	318,591	5,200	1 6	90	5 0	20,830	610	Nil	
Cumberland	18	266,933	20,188	1 0	2,930	3 6	52,395	10,176	Nil	
Derby	10	491,032	5,950	1 0	460	2 6	17,100	1,420	Nil	
Devon	45	664,697	57,879	1 6	857	5 6	106,860	6,913	Nil	
Dorset	4	199,968	2,750	2 0	27	7 6	9,250	108	Nil	
Durham	40	1,194,590	36,117	1 0	1,069	5 0	177,260	5,820	Nil	
Essex	9	1,062,645	22,804	2 6	841	5 0	120,525	6,088	Nil	
Gloucester	45	648,627	51,604	2 0	3,080	5 0	377,935	30,455	Nil	
Hampshire	19	768,608	12,057	2 0	1,066	5 0	15,420	5,948	Nil	
Hereford	8	112,549	1,523	2 6	350	5 0	11,700	2,200	Nil	
Hertford	2	239,760	600	2 6	100	5 0	1,800	800	Nil	
Huntingdon	1	46,750	200	2 6	100	5 0	2,000	1,000	Nil	
Kent	26	935,144	20,523	2 6	1,302	5 0	63,012	8,117	Nil	
Lancashire	309	4,437,518	278,857	1 0	52,630	2 6	2,465,880	506,900	Nil	
Leicester	10	440,932	7,730	1 6	175	5 0	68,560	1,450	Nil	
Lincoln	21	492,994	8,150	1 6	6,327	5 0	54,958	25,977	Nil	
London	163	4,536,541	81,431	2 6	12,289	5 0	465,760	92,635	Nil	
Middlesex	6	810,306	4,280	2 6	304	5 0	5,155	812	Nil	
Monmouth	11	316,864	9,352	1 0	426	5 0	46,310	3,213	Nil	
Norfolk	17	467,754	2,150	2 0	1,260	5 0	34,800	17,062	Nil	
Northampton	9	348,947	3,400	1 6	180	7 6	6,608	1,755	Nil	
Northumberland	39	603,119	19,675	1 0	570	3 6	129,914	17,807	Nil	
Nottingham	39	596,705	21,825	1 0	2,924	2 6	71,720	15,720	One Mar. 4/07	Under ethyl chloride
Oxford	1	186,698	437	1 6	20	5 0	1,628	160	Nil	
Rutland	1	20,753	1,965	2 0	360	4 0	9,710	3,240	Nil	
Salop	1	259,088	580	1 6	29	5 0	3,380	174	Nil	
Somerset	18	466,193	18,168	2 0	673	5 0	88,424	4,947	Nil	
Stafford	25	1,251,910	21,193	1 6	4,914	3 6	168,194	48,394	Nil	
Suffolk	10	361,900	8,186	2 0	625	5 0	34,745	4,400	Nil	
Surrey	15	718,549	6,513	2 6	921	5 0	56,464	5,020	Nil	
Sussex	4	605,785	3,480	2 0	279	5 0	26,180	1,786	Nil	
Warwick	39	906,601	24,707	1 6	15,846	2 6	125,035	148,432	Nil	
Westmoreland	2	64,409	2,300	1 0	105	2 6	13,384	4,467	Nil	
Wilts	6	263,944	7,380	2 6	75	7 6	27,950	256	Nil	
Worcester	7	500,819	4,320	1 6	1,919	3 6	41,040	9,945	Nil	
Yorkshire	255	3,596,325	96,524	1 0	15,179	3 6	661,749	151,892	Nil	
Total	1,291	30,829,695	919,399		142,872		6,106,329	1,242,167	One	

IRELAND.

County.	Number of Places in each County.	Population of County. 1901 Census.	Total Number of Administrations of Local Anæsthetics during 1908.	Fee charged for "Local."	Total Number of Administrations of Nitrous Oxide Gas for 1908.	Fee for Gas.	Number of Administrations of Local Anæsthetics since Members joined the Society.	Number of Administrations of Gas since Members joined the Society.	Fatalities.	Remarks.
				s. d.		*s. d.*				
Antrim	8	461,634	768	1 0	186	5 0	11,510	2,116	Nil	
Armagh	6	125,392	11,600	1 0	750	3 6	16,830	1,549	Nil	
Cork	10	404,611	4,750	2 0	430	5 0	19,452	1,893	Nil	
Clare	4	112,334	2,500	2 6	100	10 0	5,000	200	Nil	
Fermanagh	3	65,430	600	1 0	—	—	3,500	—	Nil	
Dublin	7	448,206	3,840	2 0	99	7 6	18,773	216	Nil	
Derry	14	144,404	5,087	1 6	26	5 0	20,648	284	Nil	
Mayo	1	199,166	450	2 6	—	—	1,330	—	Nil	
Limerick	12	146,098	2,500	2 0	350	5 0	25,000	4,200	Nil	
Total.....	65	2,107,275	32,095		1,941		122,043	10,458	no death	

SCOTLAND.

				s. d.		*s. d.*				
Aberdeenshire ..	4	304,439	520	1 0	87	3 6	3,257	615	Nil	
Ayrshire	4	254,468	3,940	1 0	150	5 0	19,400	1,050	Nil	
Dumbartonshire.	2	113,865	280	1 0	100	5 0	800	200	Nil	
Forfarshire	4	284,082	12,900	1 0	1,685	5 0	165,000	21,575	Nil	
Invernesshire ..	2	90,104	1,000	2 6	20	7 6	17,000	920	Nil	
Lanarkshire	35	1,339,327	49,024	1 0	6,871	5 0	359,739	31,326	Nil	
Linlithgowshire.	4	65,708	3,000	1 0	50	5 0	15,000	650	Nil	
Midlothian	12	488,796	4,460	1 0	6,668	5 0	31,695	16,559	Nil	
Perthshire.....	1	132,283	2,000	1 0	100	5 0	6,500	500	Nil	
Renfrewshire ..	3	268,980	1,200	2 0	500	5 0	12,000	4,500	Nil	
Rossbire.....	3	76,450	6,000	1 0	50	5 0	12,000	100	Nil	
Shetland Isles ..	1	28,166	1,000	1 6	—	—	10,000	—	Nil	
Total.....	75	3,446,668	85,324		16,281		652,391	77,995	no death	

WALES.

				s. d.		*s d.*				
Cardiganshire ..	5	82,707	600	1 6	—	—	6,500	—	Nil	
Carmarthenshire	2	123,570	4,650	1 0	—	—	35,600	—	Nil	
Carnarvonshire..	8	137,236	1,200	1 6	—	—	18,000	—	Nil	
Denbigh.....	4	126,458	4,650	1 0	26	2 6	2,100	568	Nil	
Flintshire	6	42,261	2,000	1 6	36	5 0	10,850	324	Nil	
Glamorganshire..	2	866,250	15,342	1 6	392	5 0	81,891	2,152	Nil	
Montgomery	6	63,994	2,300	1 6	700	5 0	20,000	2,000	Nil	
Pembrokeshire..	3	82,424	6,800	1 0	253	5 0	29,800	2,034	Nil	
Total.....	36	1,524,900	37,542		1,407		204,741	7,078	no death	

I hereby Certify that the above-named Statistics have been prepared from figures and information furnished by Members of the Incorporated Society of Extractors and Adaptors of Teeth, Limited.

ARTHUR NICHOLAS, *Accountant & Auditor*,
83, Bridge Street, Manchester.

15th March, 1909.

CORONERS' COMMITTEE REPORT.

Deaths resulting from the Administration of Anæsthetics.

To the Right Honourable Winston Leonard Spencer-Churchhill, M.P., one of His Majesty's Principal Secretaries of State.

Sir,

1. Pursuant to the Secretary of State's letter dated December 24th, 1908, and in connection with our inquiry into the law relating to coroners and the practice in coroners' courts, we, the undersigned, have investigated the question of deaths resulting from the administration of anæsthetics. Many of the witnesses, coroners and others, who were called to give evidence on the general subject of our inquiry, incidentally gave us useful information on the special question of anæsthetics. We examined, with particular reference to anæsthetics, three leading London anæsthetists, Dr. Hewitt, Dr. Dudley Buxton, and Dr. Silk; some eminent surgeons, as, for example, Sir Victor Horsley, Mr. Pepper, of St. Mary's Hospital, and Mr. Clinton Dent, of St. George's Hospital; physicians who had devoted special attention to anæsthetics, namely, Sir Lauder Brunton and Dr. Waller; and leading dentists, namely, Mr. Matheson and Mr. Tomes. We also had the evidence of the Secretary of the Incorporated Society of Extractors and Adaptors of Teeth, Limited, Mr. Butterfield, and of a prominent member of that society, Mr. Bowen. Finally Sir Donald MacAlister, the President of the General Medical Council, kindly attended our Committee and gave us the views of the Council, and informed us of the steps taken by them to make the study of anæsthetics a necessary branch of the medical curriculum.

2. Dr. Hewitt gave us the statistics, extracted from the reports of the Registrar-General, as to deaths under anæsthetics for the 40 years from 1866 to1905. They rose from 5 in 1866 to 155 in 1905. In the year 1897 there was a sudden unexplained rise to 126 deaths as compared with 70 in the previous year. But, with this exception, there has been a steady progressive increase in fatal accidents during the period in question. According to a

return furnished by the coroners for the year 1908, the deaths under anæsthetics reported to them amounted in that year to 235.

3. We desire to point out that no absolute deductions can be drawn from these figures. In the first place there is no duty imposed on anyone to report a death under anæsthetics administered for any surgical or medical purpose. There is therefore no guarantee that every such death is reported to the coroner, or even notified as such to the registrar of deaths. Secondly, there is an important distinction to be drawn between death *from* an anæsthetic, and death *under* an anæsthetic. For example, a person under an anæsthetic may die from the action of the anæsthetic, or from surgical shock, or from hæmorrhage, or from a combination of these or other causes. So again a person under an anæsthetic may die from some accident consequent on its administration, *e.g.*, asphyxia through the tongue slipping back, or regurgitation of food. Without a detailed investigation of each case it is impossible to say how far the anæsthetic was or was not the cause of death, or whether it even contributed to it. Thirdly, we have no statistics to show the ratio between the number of operations performed and the number of deaths under anæsthetics. This much we know, that, thanks to Lord Lister and to the system of antiseptic surgery, a vast number of operations are now undertaken with success which a few years ago no one would have dared to do, operations without which patients must inevitably die or linger out their lives often in great agony. Abdominal surgery and brain surgery are both quite modern developments.

4. Still, when all these sources of error are allowed for, we have the fact that there is an increasing number of deaths under anæsthetics, and that in the opinion of experts a certain number of these deaths are due to preventable causes. A certain number of deaths are inevitable whatever the care and skill may be with which the anæsthetic is administered.

Anæsthetics, like all other poisonous drugs, act differently on different constitutions. The idiosyncrasy of the patient is a factor which cannot be eliminated. Again, a person may be suffering from disease, *e.g.*, the status lymphaticus, which a skilled examination may fail to detect but which may greatly increase the risk. But in the interests of humanity it is of the first importance that accidents under anæsthetics should be brought down to the irreducible minimum.

We think that every death under an anæsthetic should be reported to the coroner, but we do not think that the coroner should in every case be bound to hold an inquest. He should have a discretion to decline to hold an inquest when he is satisfied on inquiry that the anæsthetic was necessary and was administered with due care and skill. The certificate of death

should always state that the deceased died while under an anæsthetic. We understand that it is the usual practice for the medical man in charge of the case to report the death to the coroner direct. This is obviously the most satisfactory procedure, but in addition we think that the registrar of deaths should be required to forward to the coroner particulars of all such cases of deaths under anæsthetics as come to his knowledge.

5. As the law stands at present, the administration of anæsthetics is under no regulation. Although a man cannot sell a glass of beer to another without a licence, he may drug that other person to his heart's content, without let or hindrance from the law. Apart from any criminal intent, a bone-setter, or a beauty doctor, or a quack of any kind is as much at liberty to administer an anæsthetic to his patient for the purpose of an operation as a qualified medical anæsthetist. If an accident happens as a result of the administration, the fact that the person administering the anæsthetic was not qualified might, of course, be material as bearing on the question of negligence, civil or criminal.

We think that this unregulated state of affairs constitutes a serious menace to the public, and that the administration of anæsthetics should be carefully regulated by law. We proceed now to consider the different classes of anæsthetics, and the regulations which in our opinion should be applied to them.

6. Anæsthetics are either general or local. Dealing first with the general respirable anæsthetics, the administration of which produces complete unconsciousness, and always involves a possible risk to life, we strongly urge that it should be made a criminal offence for any person to administer them who has not professional qualifications, or is not acting under the personal supervision of a person so qualified. We consider that the public ought to have the guarantee of professional training, and the further guarantee afforded by the administrator belonging to a recognised profession, with a high sense of responsibility, and under the disciplinary control of the General Medical Council.

7. General respirable anæsthetics fall into two categories to which somewhat different considerations apply, namely, nitrous oxide gas on the one hand, and, on the other, anæsthetics such as chloroform, ether, ethyl chloride, and the like.

Nitrous oxide gas is available only for operations of brief duration, and is the anæsthetic largely used in dental surgery. It is a very safe anæsthetic, and its effects quickly pass off. It requires, however, skill in administration, and a knowledge of how to deal with certain common causes of danger which may occur, as, for instance, that of the tongue slipping back. Registered dentists have always freely administered it without medical assistance. It would be impossible to deprive existing registered dentists of their right to use it for dental operations,

and, as regards the future we do not think that the right should be interfered with. All such dentists have now to undergo a good preliminary medical training, and, if provision is made that this should include a course of instruction in the administration of gas as a compulsory part of the training, we think that the public would be sufficiently protected.

8. One point we desire to emphasise. We have had evidence that many of the accidents which have occured in connection with the use of nitrous oxide gas occured when the same person both administered the gas and performed the operation. We think that in no case should one person attempt both to administer the gas and operate. If a medical man is not employed to administer the gas, the dentist should have the assistance of another registered practitioner for this purpose. When the patient is a woman, it is obviously important for the protection of the dentist, as well as for the safety of the patient, that a third person should be present. Single-handed operations under anæsthetics have given rise to several false charges of assault. This, however, is a matter which can be better dealt with by a professional bye-law, than by direct legislation.

9. We have considered carefully the representations of the Incorporated Society of Extractors and Adaptors of Teeth, who urged their claim to continue to be allowed to administer anæsthetics. The Secretary of the Society in his evidence told us that his Society had obtained returns from its members which showed that in England there had been 1,249,167 administrations of general anæsthetics by members of the Society, with only one fatal accident, and in that case the anæsthetic administered was ethyl chloride; there had not been a single accident with nitrous oxide gas. We have, of course, no means of testing these figures; but even if not wholly trustworthy, they bear strong testimony to the safety of nitrous oxide gas. Still, after giving due consideration to this evidence, we remain of opinion that the public safety requires the guarantee of professional qualification. No doubt many members of this Society are skilful anæsthetists, but, short of recognising a purely voluntary and uncontrolled Society as a branch of the medical or dental profession, we do not see that it is possible to draw any distinction between a member of the Society and any other member of the public at large. As the Secretary admitted, if a member of the Society is expelled for malpractices, he can still go on practising as before. The dental profession is not a close one. Any one can enter it who can comply with its very reasonable educational requirements.

Moreover, we do not think that the prohibition of the use of general anæsthetics would inflict any hardship on the members of this Society, because we gather from the evidence that they are, to an increasing extent, voluntarily giving up the use of nitrous oxide, and are using in its place cocaine and other local anæsthetics.

10. Somewhat different considerations apply to the anæsthetics of longer duration which are required for the more serious surgical operations. For such operations ethyl chloride is occasionally used, but the anæsthetics mainly relied on are chloroform and ether or combinations thereof, with or without alcohol. When pushed to any extent they act directly on the respiratory centre and the heart, and a new element of danger is introduced. Both chloroform and ether have peculiar advantages and disadvantages. Chloroform is less distressing to the patient; he goes under its influence more quickly than under ether, the period of excitement is less prolonged, and as a rule the symptoms on recovery are less unpleasant. Greater immobility is also obtained, and this is sometimes important to the surgeon; but the margin between safety and danger is narrower. Ether, on the other hand, is very much safer as regards its effects on the heart and respiration. One witness went so far as to say that it was seven times safer than chloroform. But in many cases it is unsuitable. It is unsuitable for the very young and the very old, and for any persons who suffer from bronchial troubles. Sometimes chloroform is given in combination with ether, and sometimes chloroform is given first with ether to follow. Great responsibility rests on the anæsthetist in choosing the anæsthetic for a particular operation. He has to consider the patient's constitution and state of health as well as the nature of the operation, and the safety and comfort of the patient largely depend on the anæsthetist's skill and experience.

In connection with the employment of nitrous oxide gas we expressed a strong opinion that the same person should not administer the gas and perform the operation. This principle applies with increased force to such anæsthetics as chloroform or ether. But in the case of urgent surgical operations we recognise that no hard and fast rule can be laid down. In cases of emergency, as for instance in the case of a railway or machinery accident, the medical man on the spot must do his best with such assistance as he can get. Dental operations requiring prolonged anæsthesia are never of such urgency that the presence of a medical man should be dispensed with. The accidents which may occur during the administration of these anæsthetics require full medical knowledge to deal with them. The anæsthetist must be always on the watch, and must be prepared to use artificial respiration, or even in extreme cases to resort to such an operation as tracheotomy. We are of opinion, then, that the administration of those anæsthetics, the effect of which is of prolonged duration, should be confined to qualified medical men.

11. The question of local or regional anæsthetics is more difficult. Many accidents have occured through their administration, and they may be administered in many different ways. One form of administration, however, raises no doubtful issue.

During the last few years the intra-spinal administration of stovaine or cocaine and its analogues has come into use. This method of administration is still in its infancy, and medical opinion is much divided as to the part which will be played in future by this form of anæsthesia. A certain number of fatal accidents have occurred, and in many cases distressing complications have supervened, and it is not always an advantage that the patient should remain conscious during the operation. Most of the experts who gave evidence on this question incline to the opinion that this method of anæsthesia would for a long time to come be confined to a very limited class of cases where there was great risk in administering a general respirable anæsthetic. Whatever may be the future of this new method, we think that it is perfectly clear that no one except a qualified medical man should be allowed to practise it.

12. The other uses of cocaine and its analogues for operative purposes raise a debatable question. Fatal accidents have from time to time occured in the administration of cocaine, and many individuals appear to be peculiarly susceptible to its influence. It is undoubtedly a dangerous drug, especially in unskilled and untrained hands. Some of the witnesses before us were strongly of opinion that no one except a qualified medical man or a registered dentist ought to be allowed to practise this method of anæsthesia. But the balance of opinion among the witnesses seems to be against legislative interference, and with some hesitation we acquiesce in this view. Fatal accidents have not been numerous, and many of the objections to the use of general anæsthetics have no application to local anæsthesia. No restrictions on the use of local anæsthetics (except when used intra-spinally) appear to us to be practicable or desirable. Morphia (except as an adjunct) is rarely used for surgical operations, and much more harm is done by the self-administration of morphia than by any use that is likely to be made of it for operative purposes.

13. Having considered the restrictions which we think ought to be applied to the persons who are allowed to administer anæsthetics, we think that a good deal still remains to be done before fatal accidents from this cause can be reduced to a minimum.

In the first place, the administration of anæsthetics is by no means as yet an exact science, and a perfect anæsthetic has yet to be discovered. There is no consensus of opinion as to the choice of an anæsthetic or the conditions under which it is indicated. In Scotland, for example, chloroform is more freely used than in England. Again, we have heard somewhat conflicting opinions as to the depth to which the anæsthetic should be pushed. Some witnesses were of opinion that the way of safety lay in keeping the anæsthesia light, and that the

anæsthetic should be pushed only to the point of abolishing pain; while other witnesses were of opinion that the anæsthesia must be profound, otherwise the danger of surgical shock was increased. The surgeon is between the Scylla of surgical shock and the Charbydis of paralysis of the vital centres. There is need yet for much careful clinical observation, controlled, if necessary, by physiological experiments.

Secondly, we think that both practical and theoretical instruction in the use of anæsthetics should be made an obligatory portion of the medical curriculum. The General Medicil Council have recommended that all medical students, before qualifying, should be trained in the administration of anæsthetics, and all medical schools and examining bodies are, we understand, now acting on this recommendation. We think an adequate course of training in anæsthetics should be compulsory. We fully recognise the very special qualifications and capabilities which go to the making of an expert anæsthetist. It is only by long experience, coupled with special aptitude, that a man can attain to that position, but careful instruction can do a great deal to diminish the dangers incident to the administration of anæsthetics.

We would further urge on hospital authorities the importance of keeping up in every way the status of the anæsthetists on their staff. As more attention is given to the teaching of anæsthetics, and an increased prominence is given to the position of the anæsthetists, we think that the general practice in the administration of anæsthetics would improve.

14. It has been suggested to us that in the case of deaths under anæsthetics the inquest should be held before the coroner with a skilled assessor, either in addition to, or in substitution for, the jury. We think it would be impossible to differentiate between deaths under anæsthetics and other deaths involving difficult and delicate and scientific inquiries which the coroner has to conduct. In building accidents and mine accidents, technical and abstruse questions are often involved, and coroners have sometimes voluntarily called in the aid of an expert as assessor. This practice, perhaps, might be formally recognised by law, but we think it would be unwise to attempt to go further. If, in any classes of cases, assessors were made compulsory, there would be the greatest difficulty in getting competent men anywhere outside of a few of the great towns. A coroner's inquest must always be a more or less rough and ready inquiry. It is important that the inquiry should be commenced without delay, and terminated with reasonable expedition. In many cases expert witnesses are of more assistance than assessors, because their cross-examination elucidates points which might otherwise be overlooked.

At the same time we fully recognise the importance of scientific investigation when death occurs under an anæsthetic

in hospitals, infirmaries, and similar public institutions. But such an investigation, conducted by the authorities of the institution, ought to be held under very different conditions from those necessarily attendant on an inquest where the main question is, whether any one was to blame or not. The object of the investigation is to determine the precise cause of the accident, the conditions which predisposed to it, the means which should be adopted in the future to avoid such accidents, and the circulation of the knowledge so obtained to the medical profession. In some of the larger hospitals such investigations, we understand, are now carried out, and we trust that in the future they will be held as far as possible in every case of doubt and difficulty.

15. As we have already pointed out, much yet remains to be learnt about anæsthetics and their administration, and we think that the most hopeful way of advancing knowledge would be the appointment of a small standing scientific Committee or Commission to deal with the subject.

The functions of such a Committee would be—

(*a*) To collect information from all sources, and to digest it when collected.

(*b*) To report from time to time on any advance made by the discovery of new anæsthetics, or by improved methods of administration.

(*c*) To direct chemical, toxicological, or physiological researches for the purpose of testing new discoveries or elucidating doubtful points.

(*d*) To make their information available to the medical profession in a convenient form, and at small cost.

The Committee should be nominated by the Home Office.

The Committee would require funds to prosecute its work, and we think that the Committee ought to have a grant from public funds, as progress in the science of anæsthetics is a matter which deeply concerns the public at large. Each year the death roll increases and at any moment any member of the public may have to undergo an operation which involves the use of anæsthetics. Recent benefactions have put a considerable sum of money at the disposal of the medical profession for the purpose of research work, and a portion of that money might well be devoted to researches in connection with anæsthetics. If this could be arranged the charge on public funds would not be considerable.

16. We may sum up our more important recommendations as follows :—

(1) Every death under an anæsthetic should be reported to the coroner, who, after inquiry, should determine whether it is desirable to hold an inquest or not.

(2) In the case of every death under an anæsthetic the medical certificate of death should specify the fact, whether the anæsthetic was the actual cause of death or not.

(3) No general respirable anæsthetic should be administered by any person who is not a registered medical or dental practitioner.

(4) Registered dentists should be confined to the use of nitrous oxide gas for dental operations, and should not employ the general respirable anæsthetics of longer duration.

(5) Intra-spinal anæsthesia should be practised only by registered medical practitioners.

(6) Practical and theoretical instruction in the administration of anæsthetics should be an essential part of the medical curriculum.

(7) Such instruction in the administration of nitrous oxide gas should be an essential part of the dental curriculum.

(8) In the case of any death under an anæsthetic in a hospital or other similar public institution, there should be a scientific investigation into the actual cause of death conducted by the authorities of the institution.

(9) A small standing scientific Committee on Anæsthetics should be instituted under the authority of the Home Office.

We have the honour to be,

Sir,

Your obedient servants,

M. D. CHALMERS, (*Chairman*).
MALCOLM MORRIS.
H. H. SHEPHARD.
T. A. BRAMSDON.
W. H. WILLCOX.

J. F. MOYLAN (*Secretary*),
18th March, 1910.

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