confirm the results in the Byculla Gaol, the plague prophylactic will appear to influence the disease in men in a very advanced stage of incubation, the period of the latter being in plague apparently between two and seven days, whereas the prophylactic will appear to act in some twelve to fourteen hours, arresting or mitigating the disease in individuals infected several days before. The rapidity of its effect would recall the immunity produced in a few hours in animals by injection of non-fatal doses of comma bacilli into the peritoneal cavity.

Between January 10th and May 6th, 1897, 11,362 individuals from the infected areas have been inoculated by the above process with the following occurrences, which do not include those in the Byculla House of Correction detailed above.

The fatal occurrences were 12, namely: 3 patients who were already unwell at the time of inoculation; 3 patients who contracted the disease within twelve hours after inoculation; 2 patients who fell ill within three days after inoculation; 4 patients attacked fifteen to twenty-five days after inoculation. The attacks with recoveries numbered 33.

Figures relating to the general population are not available for an exact comparison with the death-rate from plague in the corresponding classes of non-inoculated persons. A rough estimate, however, would seem to show that the inoculated have suffered to an extent about twenty times smaller than than the non-inoculated living under the same conditions and exposed to the same chances of infection.

ON SOME TYPICAL CASES OF DISEASES OF THE EAR.*

By GEORGE P. FIELD, M.R.C.S.,
Aural Surgeon to St. Mary's Hospital, London.

In the following remarks I purpose to call attention to certain typical classes of cases which frequently come under my notice as an aural surgeon, and as to the nature and treatment of which I think it will be advantageous that I should make some observations, in order that those who are engaged in general practice may perceive the point of view from which these cases are regarded by the aurist.

ACUTE OTITIS MEDIA IN YOUNG INFANTS PRESENTING SYMPTOMS SIMULATING THOSE OF MENINGITIS.

For these cases paracentesis is necessary; but it is to be regretted that they have not yet generally received the benefit of treatment. I have operated now in a great number of them with excellent results. Paracentesis has sometimes proved ineffectual because it has been deferred till too late, there having been retraction of the head for more than a week, or because after puncture the Politzer's bag had not been used to dislodge the accumulated pus. The evacuation of the pus is followed directly by relief of the urgent symptoms.

My attention was first drawn to this subject by Dr. Cheadle, Dr. Barlow, and Dr. Lees, of the Children's Hospital, Great Ormond Street, and they have very kindly, in response to a request from me, placed at my disposal some valuable remarks thereon. Dr. Cheadle writes as follows:

"I recognise fully the value of puncture of the membrana tympani in certain cases of head affection in young children, notably in cases of suspected meningitis of a non-tuberculous type, and in obscure head pains in infants occasionally due to median otitis. I have seen young patients with acute symptoms closely resembling 'posterior basic meningitis,' who have been quickly relieved, and who have got well after puncture of the membrane and free discharge of purulent matter. Indeed, I can call to mind one instance in which grave symptoms ceased immediately after this operation, although there was not at the time or afterwards any apparent discharge of offending matter. Some of those curious cases of incessant screaming and sleeplessness met with occasionally in infants, and almost invariably attributed to the pains of teething, are really due to otitis. One instance of the kind occurs to me in which a child a year old had screamed violently and almost incessantly for a fortnight. There was

clearly extreme pain, but the medical man who sent the case to me could discover no cause for it. I failed to find either inflammation from teeth, pleurisy, colic, otitis, or any of the usual sources of pain. Although there were no outward signs of otitis, however, I remembered an instance in which the similar obvious intense pain and incessant screaming for many days of a young child had suddenly come to an end with the free discharge from the ear of pus, the existence of which had not been suspected. I suggested that the question of median otitis should be solved by puncture of the membrane. As you may remember, this was effected by you with satisfactory result of immediate relief and peaceful sleep directly afterwards. It is possible, I think, that certain cases of simple meningitis the cause of which has not yet been traced may be due to the entrance of infective matter through the ear passages from the throat. Puncture of the membrane might in these cases be of great service."

I have received also a most instructive statement from Dr. Barlow, who writes:

"I may briefly say that my friend, Dr. Lees, and I have for several years been struck with the importance of the relation of otitis media in the cases of posterior basic meningitis in infants. It is perfectly true that some degree of otitis media is a very common condition found *post mortem* in young children dying from very many diseases apart from meningitis. But this very great frequency of otitis media has suggested to us that it may afford a ready mode of transmission of the results of infective catarrhs from the mouth and upper passages to the membranes of the brain. We believe it to be almost impossible to distinguish some cases of early posterior basic meningitis from cases of otitis media. Thus we have seen marked head retraction, fever, extreme irritability, vomiting, and even convulsions—symptoms compatible with commencing posterior basic meningitis—relieved by incision of both tympanic membranes and subsequent escape of thin mucopurulent fluid, and followed by complete ultimate recovery. In other cases there has been only temporary relief from this measure, and the further progress of the case has showed renewed cervical opisthotonos, tonic spasms of limbs, gradual supervention of hydrocephalus, and death, with *post-mortem* evidence of meningitis in the posterior base. The position, therefore, that we have felt justified in taking is this: In a given case there is a chance that incision of the tympanic membranes may give relief and eventuate in perfect recovery, and, if it does not procure more than temporary relief, the operation, performed by a competent surgeon, does no harm. I may mention that in at least eight cases under my care recovery took place after the operation had been performed, sometimes by Mr. Pollard, sometimes by Mr. Ballance, and that these were all cases in which the diagnosis of slight but early posterior basic meningitis was tenable. In a great number of severe cases, in which the head retracting and other symptoms were more pronounced, the incision was only temporarily beneficial; but in no case was there any ill result. You will recall the cases in which Dr. Lees has had the advantage of your help, and in which, I think, I am right in affirming the results were parallel to the above."

I have further to quote the testimony of Dr. Lees, who writes to me thus:

"I would point out that otitis in infants, owing to the incomplete development of the petrous bone during the first year of life, is very apt to infect the cerebral membranes and cause meningitis. This extension may occur even when symptoms pointing definitely to the ear have been slight or absent. Paracentesis of the tympanic membranes has undoubtedly arrested the symptoms in several cases where it has been employed early, but at a later stage it has often proved quite useless. Retraction of the head is the most important symptom; when this occurs within a few days after the commencement of the illness, and especially if it is accompanied by vomiting or any kind of convulsion, the question of paracentesis should always be considered at once. Sometimes the head is turned partly to one side, and obvious signs of pain in the ear may be present; but these may be absent. Otorrhoea is rare, and must never be waited for. Optic neuritis, also, is extremely rare. The fontanelle may be tense. If paracentesis is performed within a few days after the development of such symptoms, it will often save life. But in

* Read at a meeting of the South Eastern Branch of the British Medical Association.

view of the smallness of the parts, and the proximity of the carotid and the lateral sinus, I think that the help of a skilled aurial surgeon is almost indispensable."

To this testimony I have to add only that I feel confident that every year, owing simply to the non-discovery of pent-up pus in the tympanic cavity, scores of children die or fall victims to chronic hydrocephalus or complete idiocy.

INFLUENZA.

It is remarkable how many cases of various forms of ear disease result from that recent scourge, influenza. One may, perhaps, suspect that it is credited with the origin of many a complaint simply for lack of any other assignable cause, just as formerly gout was regarded as directly or indirectly the source of every malady under the sun. This, however, is no matter for wonderment when we consider the extremely grave condition to which patients may be reduced by an attack of influenza. The thorough prostration of the bodily powers is then frequently evidenced in affection of the auditory with the other nerves, eventuating in excessive deafness. Without enlarging on this subject, I may state that I have found strychnine in small doses to be in most cases the best remedy. In very obstinate instances I have had excellent results from pilocarpin. One gentleman, Mr. R., a resident in Perthshire, who was almost stone deaf, was completely restored after taking one-tenth of a grain three times a day for six weeks. Another case, Mr. G., whom I saw in consultation with Mr. Howard Barrett, derived astonishing benefit from its use. I should mention also that I have seen some cases which, after the ineffectual exhibition of this drug, have been cured by the judicious employment of the syringe and warm water.

As regards labyrinthine deafness following influenza, I have had the advantage of learning the opinion of Dr. Gowers respecting several of his patients whom I have seen, and for further information on this interesting subject I would refer you to his admirable Bradshaw Lecture on the Subjective Sensations of Sound, published in the *BRITISH MEDICAL JOURNAL* of November 11th, 1896.

But of the diseases met with after influenza, the most common is acute otitis media with perforation of the membrana tympani. The development of the inflammation is so rapid that perforation usually takes place after a few hours' intense pain, before the surgeon has been sent for. It is astonishing how in such cases—of which I have seen hundreds—immense quantities of blood and pus will continue for days or even weeks to pour from the drum of the ear. Very disagreeable results, as I have witnessed on several occasions, may come of the common practice of using strong lotions in the acute stages of the disease or of filling the meatus with antiseptic powders, sudden cessation of the discharge, accompanied often by very serious brain symptoms, having been so occasioned.

The plan I adopt, if there be acute inflammation and the pain severe, is to leech repeatedly till all suffering has subsided, and to syringe the ear very gently six times a day with a solution of potassium permanganate in warm water. When the discharge has lessened stronger lotions may be substituted. For healing the perforation I have found the application to the edges of a solution of silver nitrate, 15 gr. to 3j, by means of cotton wool twisted on a fine probe, to be the most promising method of treatment. Six years ago I saw a young lady with a perforation of the right membrana tympani after influenza. Treated in the way just indicated she soon got quite well. Four years later I was called into the country to treat her for the second time for the same disease, now located in the other, the left, ear. She was then dangerously ill, and her acute symptoms did not subside before she had been twice leeches. The discharge was the most copious I have ever seen, and it continued for a month. The perforation was then healed by means of nitrate of silver. The condition of both ears is now quite normal.

In older persons the perforation does not heal so rapidly as in this instance, especially if it has persisted for long. J. W., aged 63, came to me with a profuse discharge that had been going on for six months. It had been treated in vain by various powders, including boracic acid, but was soon got rid of by the treatment I have mentioned. The perforation, however, did not heal.

I saw in consultation with Dr. Hughlings Jackson, Dr. Stephen Mackenzie, and Dr. Howard a similar case—a lady of about the same age, whose ear steadily improved after being frequently washed out with the lotions referred to, though, when I last saw her, the discharge had not quite stopped. Here, again, the perforation is not likely to close. A strong, healthy young man, on the other hand, who was sent to me by Dr. Symes Thompson with a large perforation and abundant discharge, became perfectly well after a fortnight's treatment, the perforation being completely healed. In very young children not only is the treatment troublesome, but progress may be tedious. An American lady, Mrs. C., sent for me a fortnight ago at Mr. Critchett's request to see her baby, aged 7 weeks, who had double perforation and profuse discharge, and the child's very slow improvement is delaying its relatives' return to New York. It is evident that, in giving a prognosis in cases of otitis with perforation, the patients' age should be taken into account.

A gentleman, Mr. O., had suffered from an offensive discharge after perforation of the membrane, a sequel of influenza. Carbolic, boracic, and salicylic acids, both in strong solution and in the form of powder, had been tried on him without avail. I prescribed syringing four times a day with weak solution of potassium permanganate, to be followed by the use of a lotion of lead acetate, glycerine, and opium. The swollen, tender, and excoriated meatus soon improved in appearance, and in three weeks the discharge ceased; during the two years that have since elapsed there has been no return of it. I had a like case, that of a medical man, recently. There had been a profuse discharge for a long time, which had obstinately resisted the heroic remedies employed for its cure, but which yielded in a fortnight to mild applications. These and similar experiences point to the necessity of avoiding the common error of assuming that violent inflammatory action is, as a matter of course, to be quelled by strong remedies.

Quite recently I was called in consultation by Dr. R. J. B. Howard to see the case of a lady suffering from influenza. The disease had already run through the house, and she was the last to be attacked. She had a high temperature, constant cough, and acute pharyngitis, and complained of great pain in both ears. I saw her only about an hour after the pain had come on, and owing to the immediate resort to free application of mustard all round both ears the redness of the membranes disappeared, the pain subsided, and the patient got well without progress of the inflammation to the formation of pus. But it is rarely that the surgeon is called in so early to see a case of this sort; usually by the time he has arrived an abscess has formed, and has ruptured the membrane, through which there is a free discharge.

EAR DRUMS.

The question of the use of artificial ear drums in the case of persistent perforation of the membrana tympani is one which the practitioner may at any time be called upon to decide. One fact which cannot fail sooner or later to force itself upon his attention is that, apparently from some mistaken notion as to what constitutes the sacred liberty of the British subject, quacks are quietly permitted by the legislature to advertise and do a large trade in ear drums as a panacea for every form of deafness. I have seen numerous hospital out-patients who have pinched themselves and saved up for weeks in order to buy these contrivances for the extortion of cash from the credulous. Finding that not the slightest benefit has been derived from the drums, their purchasers come to the hospital complaining that the vendors will not take back their wares. In reply to the observation that such trash should never have been bought, one is told, "But, if you read their books, you will see they cure all their cases." Great is the astonishment at the suggestion that all the glowing testimonials have emanated from those persons themselves.

An instance in point is one which presented itself to me a short time ago. A gentleman brought his wife to me, and asked me to examine her right ear. I told him that hers was a hopeless case of long-standing thickening of the drumhead. "Oh," said he, "you don't know your business; she has a perforation." "I perceive," was my answer, "that you have been to the patent ear drum place—I won't say where." I

had seen already many other cases from this establishment. The friends who go with the patient to the quack's den are requested to look through a machine like a telescope, and they behold what they are given to understand is a large hole in the drumhead of the affected ear. They are not aware that, whoever the patient, the hole is one and the same, being a manufactured object which, like the fly that the astronomers of Butler's verse take to be an elephant in the moon, has its existence within the telescope. I believe that this is the only country in the world where barefaced imposture such as this is allowed to go on, and it is high time the General Medical Council should begin to deal with it.

There can, I think, be no doubt that the best form of artificial ear drum is Yearsley's pellet of cotton wool. Its very simplicity, however, is its defect in the eyes of the public, who prefer the more complicated, largely advertised, and practically useless articles. I taught a lady to use the cotton-wool drum. Before its use she was so deaf that for mental entertainment she always read at her meals, but afterwards she could hear quite well. "When I don't want to hear what my husband has to say," she observed, "I take the wool out." It is a remarkable fact that often, after using the pellets of wool for some time, the patient finds that his hearing is so much improved that they can be dispensed with. To obviate speedy drying the wool is best moistened with glycerine and water.

THE SYMPTOMS, TREATMENT, AND PROGNOSIS OF OBSTRUCTION OF BOTH EUSTACHIAN TUBES FROM CHRONIC NON-SUPPURATIVE CATARRH.

I may remark that in our extraordinarily variable climate, with possibly summer weather in April and winter in May, this affection is perhaps the most common that we have to deal with. The longer I live the stranger does it seem to me that large numbers of persons allow themselves to remain for years more or less deaf from this cause without once attempting to seek relief. It would seem that the members of our profession are partly accountable for this, for I have repeatedly discovered that patients, after being blistered once or twice without perceptible result, have been told that nothing further can be done for them. Now the very medical men who will make such pronouncements, if ever it is their lot to become in the slightest degree deaf, resort not to blistering—that for themselves they utterly abhor—but to such aid as their friend the aural surgeon can afford. To him they come with long faces—I have seen as many as ten of these sufferers in one day, and all are possessed with the same apprehension that they will ere long find themselves incapable of using the stethoscope.

I will now give you a typical case of a patient who was told by his doctor not to seek for additional advice as to his deafness. He is a solicitor, aged 51, in large practice, and he came to me suffering from obstruction of both Eustachian tubes. He was so deaf at the time I first saw him that one had to shout into his ears to make speech at all perceptible. The tuning fork he could hear fairly well, but the watch was unnoted by either ear. He heard neither better nor worse in a noise, a fact evidencing that there was neither considerable thickening of the drumhead nor much implication of the auditory nerve. The membranes were of course drawn inwards.

The history of this patient, as related by himself, is to the following effect: When about 21 or 22 he became conscious of slight deafness in one ear. As several visits to an aurist had been productive of no result, and his general hearing was unaffected, he soon ceased to trouble himself about his condition. During the next fifteen or sixteen years, however, the affected ear gradually became worse, until at length he lost all hearing in it. Some twelve years back, during a period of serious illness characterised by insomnia and mental depression, the hearing of the other ear began to be impaired. Some simple remedies for the deafness, together with general treatment, were then employed by the patient's doctor. From year to year there was an increase in deafness, which was accelerated in the early part of 1896. Towards the autumn of that year there was the greatest difficulty in hearing anything, and the patient concluded that he should no longer be able to remain in practice. For many years he had strongly held to the persuasion that his deafness was incurable, and

had resisted the importunities of his friends to consult an aurist; when, however, the question arose of abandoning his profession, he came to me.

He reports that he can now converse with clients easily, and can hear the striking of clocks, and even the playing of a piano in a room adjoining his own. What he thinks calls for special mention is that he can hear equally well with either ear. The treatment by which these, to the patient, surprising results were achieved consisted in the passing of a Eustachian catheter three times a week, and injecting through it sterilised vaseline, the inhalation of the vapour of iodine and acetic ether, mxx of each in a pint of hot water, and counter-irritation over the mastoids.

BOILS IN THE EXTERNAL AUDITORY MEATUS.

These constitute another frequent and intensely painful form of disease, occurring most usually in spring and autumn, or in the spring and fall of the year, as the Americans have it. As an application for the relief of the pain, which is to be attributed to pressure of the circumscribed abscess on the opposite hard wall of the meatus, there is in my experience nothing better than glycerine. This acts by relieving tension, and it should be mixed with an equal quantity of tincture of opium and some boracic acid, and applied hot on wool. The operative treatment necessary is incision, which must be deep, in order to obviate recurrence of the boil on the tragus or other parts of the ear.

Persons who eat much sugar appear to be specially liable to boils, and the efficacy of yeast in furuncular disease may possibly be accounted for as a result of its disintegrating action upon that substance. In this connection I think I cannot do better than quote the opinions and experience of one who, though not a medical man, is a gentleman of considerable scientific repute. I was consulted by him a fortnight since, as on several other occasions during some ten years, on account of boils in the meatus. In a letter I have lately received from him he points out that members of the same group of cocci as those which cause boils grow and multiply in a sugary solution, and that diabetics, whose blood is charged with sugar, are peculiarly susceptible to boils and carbuncles, but in the most marked degree before the discovery of the nature of their ailment has necessitated an alteration in their diet. He further maintains that, inasmuch as yeast certainly carries on some of its fermentative processes in the stomach, its use as a remedy for boils is attributable to its destruction of sugar in the food ingested. When a boy he noticed that honey acted with him as a poison, being sure to produce boils, for which yeast was a certain cure. Sugary diet in general, and even a treacly medicine taken on one occasion he found to produce a similar effect. Inability properly to digest sugar, dependent on a low state of health, and a consequent excess of it in the organism may, he concludes, be the explanation of the frequent association of boils with defective vitality. In his case a tablespoonful of yeast after breakfast, borax as a local application, and attention to diet have invariably been efficacious in the treatment of boils.

The weak point in this argument is, obviously, that it adduces no evidence that saccharine material as such—indispensable for the yeast plant—can serve as a pabulum for the staphylococci specially associated with boils. It may further be urged that boils are among the manifestations of a great variety of unhealthy conditions, being occasional sequelæ of typhoid fever and frequent concomitants of the cachexia produced by the inhalation of sewer gas, and that their presence by no means necessarily points to the existence in the blood of a superfluity of saccharine material, but simply emphasises the fact that the resistance of the whole organism to the attacks of disease germs is weakened by any condition adverse to the bodily well-being. It may again be suggested that possibly the antitoxic effect of the introduction into the blood of by-products of the processes of fermentation may be the true explanation of the potency of yeast as a remedy for boils. The whole subject, however, is one which well deserves careful attention.

I will not recapitulate here observations which I have already made on the desirability of ascertaining in respect of every case of boils in the ear or of acute otitis media that the *fons et origo mali* is not an escape of sewer gas. Some

tact and resolution may be requisite in pressing for an inquiry into this important matter; indeed, some individuals seem to resent almost as a personal affront a hint that the sanitary arrangements of a house which they have made their abode can be otherwise than perfect. Latterly, I have seen a great many cases from India, more especially from certain parts of Bombay and Burmah, in which acute inflammation of the tympanum has gone on to perforation and discharge, and I have been unable to attribute this mischief to anything else than foulness of atmosphere from unhealthy surroundings.

THE SAFE ADMINISTRATION OF ANÆSTHETICS : WITH SPECIAL REFERENCE TO CHLORO- FORM AND METHYLENE.

A REPORT OF SIX HUNDRED CASES.

By CHARLES O'NEILL, M.D., MCh., D.P.H.,
Belfast.

THE high death-rate caused during the administration of anæsthetics is a sufficient reason for every medical man so to study the subject and perfect the system of giving anæsthetics as to reduce the mortality to the lowest possible amount.

THE PREPARATION OF THE PATIENT.

The patient should be prepared by taking a hot bath the night before, and at bedtime a brisk purgative, and the following morning a light breakfast about three hours before the anæsthetic is administered. Giving an anæsthetic on a fasting stomach tends to retching, and occasionally great depression and weakness. Should the patient have taken a full meal shortly before having an anæsthetic, it often causes vomiting during the administration, allowing them to recover and causing delay. When vomiting occurs during its use, the patient should be turned on the left side, so as to prevent any of the vomited matter from entering the trachea. Should vomiting occur after the anæsthetic is stopped, it is merely a sign of returning consciousness.

Before giving an anæsthetic you should examine carefully for any signs of mitral disease, fatty degeneration or dilatation of the heart, or calcareous degeneration in the vessels, or chronic bronchitis, asthma, or pleurisy. Should abdominal dropsy be present, sufficient to cause thoracic pressure, any of these conditions should warn you to use great care in the administration. See that there is no tight clothing on the chest or abdomen; everything must be loose to allow of free breathing. If the patient has got artificial teeth, they must be removed. If possible the urine should be examined for albumen and sugar.

THE METHODS OF ADMINISTRATION.

In administering anæsthetics, one of two ways may be employed. First the so-called "open" or "Syme's" method—why so called is a mystery, as it is really a method where the fresh air is almost entirely excluded from the patient while taking the anæsthetic. In this method you pour a certain quantity of the anæsthetic on a towel, sponge, or lint, and hold it over the patient's mouth and nose. The distance it should be kept off the face cannot be ascertained in any reliable manner. On the other hand, distance makes little difference whether it is held 2, 4, or 6 inches from the face. If the atmosphere of the room is quiet, the vapour drops down in a more or less undiluted form, being heavier than air; while if the room is draughty it is more uncertain still, as the patient may only get an occasional breath of the anæsthetic. Unless in midwifery practice and in some exceptional cases, I consider this a most unscientific way of giving it. It is idle to talk of graduating the dose of the anæsthetic to the age and requirements of the patient, so long as this rough and ready way is employed. We should dilute an anæsthetic with air as carefully before it is breathed as we would dilute hydrocyanic acid with water before administering it to the stomach. In this method the dose is uncertain, and depends, not on what you put on the towel, but on what quantity reaches the lungs, and the patient is compelled at first to inhale air saturated with the vapour of

the anæsthetic until little is left on the towel. On adding more you keep the patient oscillating between an overdose and an underdose. This is a very wasteful way of giving an anæsthetic, a case being recorded in the BRITISH MEDICAL JOURNAL of July 14th, 1894, where a female, aged 25, had 12 drachms administered in thirteen minutes before becoming unconscious. The operation lasted fifty minutes, and the chloroform used was 31 drachms.

The second method, which I consider the safe one for administering methylene or chloroform, is by giving it through a Junker's inhaler, which has been much improved by Messrs. Krohne and Sesemann, London. The improvements on the older inhaler consist in the addition of a respi-

Junker's inhaler.

ration indicator and a soft inflating indiarubber cushion fitted on the facepiece. When this inhaler is used you can regulate the dose, and the patient at each inspiration takes in the normal supply of air properly mixed with the anæsthetic. It may be used with equal safety for persons of any age. In giving an anæsthetic a most important point is carefully to observe the breathing; see that it keeps regular, and stop giving the anæsthetic whenever it shows signs of irregularity, and allow free access of air until it becomes normal. Since the breathing is of much more importance to observe than the pulse, the pulse is of importance where the patient has had severe hæmorrhage previous to or during the administration. In these cases the pulse is very important to watch carefully for showing signs of collapse. In ordinary cases it is sufficient to watch the respiration, as there is great danger in watching the pulse to overlook the breathing, since the heart is only affected secondarily in consequence of the failure of the respiration. If an anæsthetic is pushed so far as to cause the pulse to show signs of heart failure the limit of safety has been so far exceeded that a fatal result is likely to ensue. One great source of danger in administering anæsthetics is when the person giving it watches some interesting operation and takes his attention completely off his own duties. Should the patient cease breathing for thirty seconds it is almost impossible to restore animation. Another danger is when the patient struggles while taking the anæsthetic and requires holding, you should see that no pressure is applied to the chest or abdomen, as the breathing obstructed in this way causes collapse. If the tongue falls back it is also a source of danger; or the patient may require to be turned on the side for an operation to be performed; this may also cause dangerous symptoms.

Death from sudden stoppage of the heart without any previous warning from irregular breathing is most frequently caused by giving too much of the anæsthetic, since in an overdose the supply of air is cut off, and in its place a narcotic is given. The risk is increased by the patient struggling, or by anything which causes them to take gasping or irregular inspirations. Sir James Simpson advised the administration of a large dose at first as he considered the state of semianæsthesia the critical time. Of course, fatal cases have occurred at the beginning of the administration, but it is more likely they occur from an overdose than an underdose, as the more of the anæsthetic used the less air is inhaled. In using a Junker's inhaler, you add the vapour of the anæsthetic to the normal quantity of air used in breathing. In giving an anæsthetic to grown-up persons, you should instruct them to breathe in the ordinary regular way,