and in both there was the hoarse, dry, cooing murmur of respiration, which is so definitely characteristic of the first stage of bronchitis. The heart-beat was quick and embarrassed, and the skin was hot and dry. The guinea-pig was in every sense the most affected. After ten minutes, both animals were placed in their ordinary hutch. Very soon afterwards, the guinea-pig began to sink, and died. The rabbit continued to breathe quickly, and for some hours was indifferent to food and feverish. The mucous membrane of the nose and mouth was also dry and injected. On the following day, the respiration was still quickened; but the dryness of respiration had given place to a moist *râle*. On the third day, the animal may be considered as having recovered.

Immediately after death had taken place, the body of the guinea-pig was quickly opened. The right side of the heart was found congested with blood; and the kidneys and all the vascular organs were greatly congested. The lungs were ecchymosed; in parts, their structure was as white as milk; in other parts, there were deep congested spots of the size of a pea, into which blood was effused. The bronchial surface was not congested; but was covered with a frothy tenacious mucus, which exuded from the lungs in all parts where they were incised. The blood underwent moderately quick coagulation, but its colour was not materially modified; the venous blood was, perhaps, more than usually dark; and the arterial, by contrast, was markedly red. These were the natural conditions of the blood of the animal, in a degree peculiarly well developed.

In this experiment, we gather very important and useful information. We see, in a word, an induced bronchitis—a true synthesis of disease. If a man had been exposed out of doors to ozonised air, and had returned home with similar symptoms of disease, quick pulse, hot skin, rapid breathing, and dry coarse respiratory murmur, we should not hesitate for a moment in our diagnosis. If he died rapidly, and we found the morbid conditions presented by the guinea-pig, we should undoubtedly return the disorder that killed as congestive bronchitis. If he recovered with free secretion on the bronchial surface, as the rabbit did, we should style the affection acute bronchitis terminating by resolution. It does not seem to me that the formulæ of the artificial and of the natural disease admit of distinction or difference.

It is worthy of note that, in the experiment thus recited, the air was saturated with ozone. It may be asked on this, whether the same train of symptoms would follow if less activity of oxygen had been produced. I have an answer to that inquiry at hand. Fourteen days previously to the performance of the last experiment, the very same animals were exposed to a current of ozonised air for the same period of time. On that occasion, the air was ozonised to not quite half the same degree as before, and the temperature of the air was five degrees lower. Then both animals manifested symptoms of the same character precisely as on the later occasion; but the symptoms were not so intense. Both animals had rapid breathing, hurried circulation, and coarse respiratory murmur; but on being removed from the active air, they recovered without a bad sign.

Lastly, the rabbit had, with another rabbit, been made to breathe air partly charged with ozone at a temperature of 56° Fahr., one month previously to the second experiment. It and its fellow then exhibited similar symptoms; but, after two hours' inhalation, it recovered on removal into the open air. I was aided in all these inquiries by my friend Dr. Wood; and no element, as far as we could see, was wanting to make the research complete and free from objection. The apparatus was most simple, the working easy, and the proceedings of each successive step were conducted carefully and without haste. The same care was taken in the experiments related in my previous paper, where oxygen itself was employed.

Taking the whole series of experiments into consideration, I do not think there can be a doubt that ozonised oxygen, on being inhaled, produces, as its first degree of action, catarrhal irritation of the mucous membrane of the mouth, throat, and nostrils; as its second degree, extension of irritation to the bronchial surface, and bronchitis; and, as its third, exudation into the structure of the lung, molecular change in the blood, with separation of fibrine, a form of general inflammatory fever and death.

And now the great and vital question to be considered is:—Whether we, as occupants of this earth and enclosed in a vast chamber of atmospheric air, are ever exposed to oxygen in such active condition that it shall light up in us the same symptoms as can be artificially induced in the inferior animals. The question would seem to admit of easy solution, and all the elements for its solution may, in truth, be present; but it is surrounded with difficulties nevertheless. The great difficulty lies in this, that we have no correct and ready means of measuring, or I had better say of estimating, the extent to which air is charged with ozone. All the rules on this point, as at present supplied, turn out, in practical work, to be fallacious tests. They may show presence; but they do not show quantity beyond a certain degree. The ozone-papers discolour up to a given depth; then they cease to act, and not only so, but on exposure they are apt to become discoloured by other agents, and it seems now that they may lose colour in the air, so that the maximum they have registered may be lost. We have, therefore, as yet, but an imperfect guide as to the presence of ozone and no guide as to the intensity of its action. Further, the determination of the actual presence of ozone may be obscured by other substances which do not probably interfere with its action upon the organism.

Something may be taken into account here in respect to common sensation. I know that, during easterly and north-easterly winds, I have breathed air which to sensation is as much like ozonised air as can well be compared; and I have experienced from such air the same effects as come from ozone—viz., irritation of the throat and nose, and catarrh. In some instances of this kind, the ozone-paper has demonstrated ozone; in others, it has not. Is the test here at fault? I think so. Any way, of this we may be convinced—that ozone cannot possibly be present in the air for many hours, at a temperature above 55° Fahr., without producing in those subjected to its influence some shade of effect. It would not affect all with the same degree of intensity; it does not do so in the course of actual experiment, but in many it would of necessity give rise to catarrh, to bronchitis, to pneumonia, or even to croup.

THE ADMINISTRATION OF OPIUM IN OBSTRUCTION OF THE BOWELS.

By Thomas James Walker, M.D., Surgeon to the Peterborough Infirmary and Dispensary, etc.

Several communications have recently appeared in the pages of this Journal advocating the use of opium in strangulated hernia and in ileus; and although this treatment has no claims to novelty, examples of the mistaken practice of administering

purgatives in these cases are too frequent to render the advocacy of opium superfluous.

Always bearing in mind, then, the evils of delay in cases of strangulated hernia, and the danger of dallying too long with medicines, we may assume that the use of opium in this class of affections is of great importance; and this being granted—what is the best mode of administering it? We require its full sedative effect, and this, as rapidly as possible; and we have usually to contend with a condition of the stomach which causes it to eject everything received into it, before time for absorption has elapsed.

Two years since, when I saw a case of femoral hernia about twelve hours after it had become strangulated, it struck me that, by the subcutaneous injection of morphia, we might obtain the result which the surgeon who had previously seen the case had sought for by the administration of an opiate draught. Instead, therefore, of proceeding to the operation for the division of the stricture, which we were about to perform, so soon as we should have administered chloroform and tried the taxis, we injected almost a grain of muriate of morphia (liq. morph. muriat. ♏ L, P.L., 1851), and left our patient quiet for a few hours.

On our return, we found her free from pain and sickness, the tumour no longer tense; and without any difficulty we succeeded in returning the now reducible hernia. Although we cannot, of course, expect such a happy result in all cases where the full effect of an opiate is obtained, it is something to be able to obtain this effect; and I would, therefore, strongly urge the adoption of this mode of administering opium at once, in cases of strangulated hernia, instead of wasting time in futile efforts to obtain the effect of the remedy by administering it by the mouth. I have used this method now in several cases, where I have seen the patients early, and of course have never failed to induce the physiological effects of the drug, although with one or two only of the cases of strangulated hernia has the result been to render the operation unnecessary.

The method of exhibiting remedies by subcutaneous injection is now pretty generally practised, and the plan which I am in the habit of adopting and which I here recommend, has probably occurred to others of our associates; but in my hands it has so manifestly saved patients from the danger of an operation, that I would impress upon all the duty, when administering opium for obstructed bowels, of adopting this simple and efficacious improvement in practice.

Medical Qualifications. The governors of the Stockport Infirmary have adopted the following resolution: "That a degree in medicine of a British university, or the licentiateship of the Royal College of Physicians of London, or the license of the Apothecaries' Company of London, be accepted by the committee as proof of medical qualification in all cases where the licence of the Apothecaries' Company, London, alone is now required by the rules.

Medical Charities. The magnificent medical charities of our land, established and supported by individual benevolence, are usurping the duties of society at large. Their object is frustrated, and their utility impaired, by the increasing number of paupers who crowd their doors. These come, not less for the food they sometimes obtain, than for the medicines they require, but they come chiefly because they have no confidence in the medical relief provided by the Poor-law, and, least of all, in the treatment received in the workhouse hospital. *(Dr. Stallard.)*

The Medical Council.

REPORT OF PROCEEDINGS, April 1865.

Tuesday, April 11th.

G. Burrows, M.D., President, in the Chair.

Medical Education. The Council resolved itself into a Committee on Education; the President in the chair.

Age for Licence to Practise. Dr. Andrew Wood said that the recommendation of last year was—

"That the age of twenty-one be the earliest age at which any professional licence shall be obtained; and that the age shall in all instances be duly certified."

Dr. A. Smith asked whether there were any means of enforcing the recommendation, as it was sometimes notoriously disregarded.

Dr. Andrew Wood said that students were sometimes admitted to final examination before the age of twenty-one. Applications to do this were occasionally made to the Royal College of Surgeons in Edinburgh; but without success. Other boards, however, admitted candidates to examination before being of full age.

Dr. A. Smith. Some not only do this, but give the diploma.

Mr. Syme moved that the recommendation stand as follows—

"That the age of twenty-one be the earliest age at which a candidate for any professional licence shall be admitted to his final examination; and that the age shall in all instances be duly certified."

Dr. Paget seconded the motion.

Dr. Apjohn thought it unnecessary to legislate on the subject. The University of Dublin was opposed to the proposal.

Dr. Quain said that if a student were admitted to pass an examination at any age, he might do so before his judgment was properly matured.

Mr. Syme remarked that the Council must decide what was useful and necessary, without reference to the licensing bodies.

Dr. Stokes agreed that the Council must do what was useful and necessary; but much injustice might be done by refusing to admit students to examination before the age of twenty-one. There were many who might desire to improve their professional knowledge, after having been set free from the care attending an impending examination.

Dr. Allen Thomson said that there was a great difference in young men, as to their advancement in the studies by which they were prepared for examination and in their practical knowledge. He would allow them the opportunity of being examined at an earlier period, and of then improving themselves in practical knowledge. In the University of Glasgow, the men who passed the examination at the age of twenty were the best prepared. The Council had already determined that the earliest age at which a diploma could be granted should be twenty-one. This was a kind of contract with the public; but the age at which a student should be allowed to pass his final examination was a different matter. He was quite sure that the resolution proposed by Mr. Syme would have an injurious effect.

Mr. Arnott supported Mr. Syme's motion. If students complete their curriculum before the aged specified, let them follow out the pursuit of professional knowledge at home or abroad before presenting themselves for examination. The age for examination should be fixed at twenty-one; and if any of