

meat, and amounted to 32 per cent.; and the lowest proportion occurred in the case of rabbits fed on bread and oats, and amounted to 1 per cent. only.

Still more recent experiments, made with improved apparatus and methods by Pettenkofer and Voit, in Munich, show, like those of Regnault, that the proportion of the oxygen employed in forming carbonic acid, to the whole oxygen absorbed, varies with the food, ranging in the case of a large dog from 52.4 to 148.2, according as the animal was kept altogether without food, or fed upon a mixed diet of meat and sugar. These investigations have also shown that under ordinary conditions, it is probable that a dog consumes nearly all the oxygen absorbed in the formation of carbonic acid.

Before leaving the subject of animal heat, it is worth while to estimate its amount in a manner that will bring it into comparison with ordinary mechanical work.

In Lavoisier's experiment with the guinea-pig, 402.27 grms. of ice were melted in ten hours; from this fact we find, assuming the latent heat of ice at 142° F., and 772 as Joule's coefficient for converting British heat units into foot pounds—

Mechanical work equivalent to the daily animal heat of Lavoisier's guinea-pig =

$$\frac{402.27 \times 24 \times 142 \times 15.432 \times 772}{7000 \times 10} = 233310 \text{ ft. lbs.}$$

As the average weight of a guinea-pig is 4 lbs., the preceding amount of work, representing animal heat, would be sufficient to raise the weight of the animal through a vertical height of

$$\frac{23310}{4 \times 5280} = 11.05 \text{ miles.}$$

Ranke has shown, by experiments made upon himself, under various conditions of food and fasting, by means of Pettenkofer and Voit's apparatus, that his daily excretion of carbonic acid varied from 660 grms. to 860 grms. His weight was 67 kilos., from which fact, and the assumption that an English mile is 1600 meters, we obtain, employing the contents already given, the height through which the combustion of this quantity of carbon would raise the weight of 67 kilos. in twenty-four hours—

$$= \frac{760 \times 6 \times 8.080 \times 423}{22 \times 67 \times 1600} = 6.609 \text{ miles.}$$

The extreme values of the carbonic acid excreted—namely, 660 grms. and 860 grms.—would correspond to the heights of 5.74 miles and 7.48 miles respectively.

Pettenkofer and Voit succeeded in producing a range of carbonic acid excreted by a large dog, weighing 33.3 kilos., from 289.4 grms. to 840.4 grms.; the minimum corresponding to the tenth day of fasting from solid food, and the maximum corresponding to a diet of 1800 grms. of meat, 350 grms. of fat, and 1410 grms. of water.

It may be easily shown by a calculation similar to the foregoing that these excretions of carbonic acid correspond to the mechanical works of lifting the weight of the dog through vertical heights of 5.03 miles, and 14.62 miles respectively.

Combining together the preceding results, and expressing them all in the natural units of the weights of the animals lifted through a height, we find:—

Work due to Animal Heat.

Guinea-pig	...	...	...	...	11.05 miles.
Man	...	...	...	...	5.74 "
Man	...	...	...	...	7.48 "
Dog	...	...	...	...	5.03 "
Dog	...	...	...	...	14.62 "
Mean	...	...	...	...	8.784 "

(To be continued.)

ON THE NATURE AND TREATMENT OF PULMONARY CONSUMPTION AS EXEMPLIFIED IN PRIVATE PRACTICE.

By CHARLES J. B. WILLIAMS, M.D., F.R.S., CONSULTING PHYSICIAN TO THE HOSPITAL FOR CONSUMPTION AT BROMPTON; AND CHARLES THEODORE WILLIAMS, M.B. OXON., ASSISTANT-PHYSICIAN TO THE SAME HOSPITAL.

(Concluded from page 109.)

SUMMARY.

BY DR. C. J. B. WILLIAMS.

ON taking a retrospect of an experience of forty years in the treatment of pulmonary consumption, I can trace a remarkable improvement in its success, as judged by the results. During the first ten years of that period the beneficial effects of the treatment were very limited, being chiefly confined to incipient cases, and to those who were able at an early stage and for long continuance to resort to more favourable climates, such as can be obtained by voyages to Australia or India. My general recollection of the histories of the developed disease at that time is that of distressing tragedies, in which no means used seemed to have any power to arrest the malady; the tardative and palliative treatment employed was little satisfactory; and life was rarely prolonged beyond the duration of two years, assigned by Laennec and Louis as the ordinary limit of the life of the consumptive.

In the next period of ten years (from 1838 to 1848) a marked improvement took place in the results of treatment, apparently in connexion with the habitual use of mild alterative tonics, as they might be termed, particularly iodide of potassium with sarsaparilla or other vegetable tonic. These were first given in conjunction with liquor potassæ or an alkaline carbonate; but the lowering effect of the alkali led to the substitution of a mineral acid, generally the nitric; and a combination of this description (iodide of potassium, two grains; dilute nitric acid, fifteen drops; tincture of hops and compound fluid extract of sarsaparilla, of each one drachm; with an ounce of water or infusion of orange-peel) became the favourite prescription until it was superseded by something which was much more efficacious. Several of the earlier of the cases recorded were treated in this way, and with improved results in respect of the general health of the patients and diminution of the cough and expectoration.

It was in the latter half of this period that chemists began to produce cod-liver oil of sufficient purity and freshness to be fit for the human stomach; and I have no hesitation in stating my conviction that this agent has done more for the consumptive than all other means put together. And so far is this remedy from having "had its day and gone out of fashion," that in my experience its usefulness and efficacy have gone on increasing in proportion to the greater facilities for obtaining it in a pure state, and to the improvements in the manner of administering it, in combination with various tonics, and in connexion with certain rules of diet and regimen. Many of the cases narrated in the preceding papers are striking proofs of the efficacy of this remedy, not only in the general results of cure or prolongation of life, but also in detached passages of the abridged histories, in which improvement or deterioration in the symptoms corresponded respectively with the regular use of the oil, or its discontinuance.

The cases selected to exemplify the preceding papers have been taken from the records of my experience during sixteen years, up to 1857. They are a very small sample compared with the whole number under my care during that period; but they are selected, not as being more favourable, but simply because they remained under observation for a year and upwards, and therefore gave the opportunity of more correctly judging of the results of treatment than those seen for a shorter time; and although this very ground of selection implies that the cases eventually became chronic, yet many were acute in the first instance, and their surviving into the chronic state may fairly be ascribed to the treatment. In stating that the average duration of life in phthisis has during my experience of forty years been at least quadrupled, or raised from two to

THE ETHER SPRAY USED TO ALLAY THE PAIN OF UPROOTING HAIRS.—M. Gailleton, of Lyons, has tried the spray in favus, sycosis, and also in impetigo seated in the beard, when it seemed advantageous to pull out the hair. When by means of the ether a given spot has become white and insensible, the hair is quickly uprooted without any pain being experienced by the patient, and the spray is directed to another spot whilst this process is going on, so that the operations succeed each other continuously until all the hair is removed.

eight years, is below the actual results as calculated by my son; for of the 500 cases, 380 were still living at the last report, and many of these are likely to live for many years to come. I may add further, that the results of the last ten years' experience, from 1857 to 1867, which have not yet been calculated, will, in all probability, be found still more favourable as regards the number of cures and great improvements, and the expectancy of life, although the time does not allow of such high figures in actual duration of life.

In conclusion, I will endeavour to give a brief general view of the treatment which I have commonly adopted. As we have been led to conclude that consumption is essentially a disease of degeneration and decay, so it may be inferred that the treatment for the most part should be of a sustaining and invigorating character. Not only the most nutritious food, aided by a judicious use of stimulants and of medicinal tonics, but pure air, with such varied and moderate exercise in it as the strength will bear, and the enlivening influence of bright sunshine and agreeable scenery and cheerful society, are among the means best suited to restore the defective functions and structures of frames prone to decay.

This is the most comprehensive view that can be taken of the means found to be most effective in the prevention and cure of consumptive diseases; but when we come to examine the details of cases we find that the treatment is by no means so simple a problem, and that varied and even opposite remedies are required to control the different morbid actions concerned in developing or in aggravating the malady. Inflammation is by no means an essential part of tuberculous consumption, and yet, as we have seen, many cases originate in inflammation, and in many more this process is mainly instrumental in aggravating and spreading the destructive ravages of the disease; therefore remedies that may be called anti-phlogistic frequently have to be used in its treatment.

I apprehend that most practitioners in this country are agreed in considering that consumption should be generally treated on a tonic and sustaining plan; and that the nourishment and strength of the system should be supported by varied tonics and cod-liver oil, as well as by the most nutritive articles of diet. But when the disease is ushered in with symptoms of acute bronchitis or pneumonia, with its attendant fever and scanty disordered secretions, it is obvious that such treatment is wholly unsuited for the occasion; and that remedies of the mild anti-phlogistic kind, such as salines, with or without antimony, blisters, and cataplasms, and sometimes even moderate leeching or cupping, will give most relief, and will prepare the patient for the safe administration of the sustaining class of remedies. In former years in this country (as still in many places abroad) the anti-phlogistic and starving plan was carried on too long and too far; but it appears to me that there is now a tendency too much to the opposite extreme, so that consumption is treated too exclusively with tonics, stimulants, and full diet. I quite admit that this is the better extreme of the two; and it may fairly be stated that the sooner, and the more constantly, patients can be treated on this plan, the better. But in case of active inflammation, continued heat of skin, hard racking cough (dry, or with viscid and tinged expectoration), much pain or soreness of the chest or side, it answers well to withhold or withdraw the stronger stimulants and tonics, and for a time—it may be a few days only—to substitute cooling and soothing remedies, with moist epithems or counter-irritants on the chest, and, more rarely, local depletion. But this discipline, which is exceptional, should as soon as possible be replaced by what may be called the regular treatment by cod-liver oil and tonics, and a more generous diet. The transition need not be abrupt. So far as regards cod-liver oil, and the mild acid tonics, with which I generally combine it, the change may be made long before the inflammatory complication has subsided. A dose of these may be given after the morning and perhaps after the midday meal, whilst still the saline is taken in the evening and night, and whilst blisters or other counter-irritants are in full operation.

So soon as the nocturnal heat of skin subsides and the cough becomes less urgent, and the urine more free, the salines may be replaced by a mere cough linctus, if that be needed; the counter-irritation moderated, and the tonic, given with the oil, gradually strengthened by the addition of small doses of salicine, quinine, or iron. These two last tonics are of great use where they are well borne, as their influence in strengthening the muscular system and in improving the condition of the blood is greater than that of any other drug; but their use requires much discretion and watchfulness, for they often increase the lingering or intercurrent inflammations, with their attendant pain, constriction, cough, and viscid expectoration,

and not unfrequently they derange the functions of the stomach and bowels. It therefore often happens, where the patient cannot be seen frequently, that it is safer to be content with a milder tonic—such as calumba, cascarilla, or chiretta,—which may be continued for weeks and months together in conjunction with the oil, than to give those that are more powerful, but which by occasional disturbances may prevent the continuance of the remedy.

But the great remedy, more essential and more effectual than any other, is the cod-liver oil; and we may well bestow a little consideration on the mode of using it to the best advantage.

It is now pretty generally admitted by the profession that the pure, pale oil, simply extracted from the fresh, healthy livers of the fish, is that most suitable for the majority of patients, as being less unpalatable and at least as efficacious as the impure kinds. Since I first recommended this pure oil (*London Journal of Medicine*, January, 1849) it has been so extensively prepared and used that it is now one of the most important articles in the materia medica; and the universality of its introduction is a strong proof of its claim to public favour.

On the mode of operation of the oil, and on the best methods of administering it, I have little to add to what I published twelve years ago ("Principles of Medicine," 3rd edit., p. 487). To that I must refer for details which would be too long for quotation here; but I may give the following brief summary of my opinions and experience on the subject.

Cod-liver oil, when taken into the system in sufficient quantities, and for a sufficient length of time, acts as a nutrient, not only adding to the fat of the body, but also promoting the healthy growth of other tissues, and in some way, as an alterative, counteracting the morbid tendency to the proliferation of the decaying cells of pus, tubercle, and kindred cacoplastic and aplastic matters.

That its efficacy depends much on its being absorbed freely into the blood, and through the circulation pervading all parts of the body, and thus reaching to the very seat of morbid deposits and formations.

That the more fluid part of cod-liver oil surpasses all other oils and fats in the facility with which it forms emulsions, which are tolerated by the stomach and readily absorbed into the blood, without causing the nausea and bilious derangement that commonly result from an excess of fat food. This peculiarity may depend on the biliary and other matters contained in the oil, which in other instances of disease is found to act beneficially on the liver and other secreting organs.

That the best time for the administration of the oil is immediately after, or, to those who prefer it, at or before, a solid meal, with the constituents of which the oil becomes so intimately blended that it forms a part of the chymous mass, and is less likely to rise by eructation than when the oil is taken into an empty stomach. From this chymous mass, the oil being absorbed through the lacteals with the chyle, is less apt to disorder the liver than if absorbed through the veins of an empty stomach.

That as the use of the oil should be continued for a long time—perhaps for months, or even years—it is of great importance to conciliate both the palate and the stomach by giving it in a vehicle which may agreeably disguise its flavour and strengthen the stomach to bear it. For this purpose an aromatic bitter, such as the compound infusion of orange-peel, acidulated with a mineral acid, both to help to cover the taste of the oil and also to suit the stomach, which should be duly supplied with acid during digestion, generally answers well. Syrup may be added according to the taste of the patient; or, still better, some bitter tincture, such as calumba, cascarilla, or quinine, in every case in which it is desirable to improve appetite and tone. In cases of peculiar weakness of stomach, with tendency to retching or nausea, strychnia, in a dose of from $\frac{1}{32}$ to $\frac{1}{24}$ of a grain, proves a most valuable adjunct to the vehicle. By its means I frequently overcome the fastidiousness of stomach arising from debility, hysteria, or indulgence in alcoholic liquors. Salicine is another efficacious alternative of the same kind. Either of these, although a powerful tonic, has none of the heating properties of quinine or iron. When the strong bitter taste is objected to, a pill, containing extract of hop or chamomile, or salicine, or quinine, may be taken after, or before, the oil and its vehicle.

The bulk of the whole dose of oil and vehicle should be small, so that it may be swallowed at a single draught; therefore the vehicle should not exceed a tablespoonful, with, at first, a teaspoonful of oil, to be gradually increased to a tablespoonful. The dose of oil should rarely exceed a tablespoonful

twice or thrice daily : when a larger amount is taken at a time, generally either it deranges the stomach or liver, or some of it passes unabsorbed by the bowels.

The acid may be varied according to circumstances. The nitric generally suits best in inflammatory cases, and those attended with much lithic deposit in the urine ; but its tendency to injure the teeth is an objection to its long continuance. The sulphuric is more eligible where there is liability to hæmoptysis, profuse sweats, or diarrhœa. But in most cases, and for long continuance, I have found reason to prefer the diluted phosphoric acid, which may be termed the most physiological of the acids, tending to derange the chemistry of the body less than the others.

With some individuals the oil agrees so well, and so much improves their digestive powers, that they require few or no restrictions in diet ; but this is not the case with the majority. The richness of the oil does prove more or less a trial, sooner or later, to most persons ; and to diminish this trial as much as possible, it obviously becomes proper to omit or reduce all other rich and greasy articles of food. All pastry, fat meat, rich stuffing, and the like, should be avoided ; and great moderation observed in the use of butter, cream, and very sweet things. Even new milk in any quantity is not generally borne well during a course of oil ; and many find malt liquor too heavy, increasing the tendency to bilious attacks. A plain nutritious diet of bread, fresh meat, poultry, game, with a fair proportion of vegetables, and a little fruit, and only a moderate quantity of liquid at the earlier meals, commonly agrees best, and facilitates the continued exhibition of the oil in doses sufficient to produce its salutary influence in the system.

In case of a bilious attack coming on, indicated by nausea, headache, furred tongue, offensive eructations, high-coloured urine, and sometimes pain and tenderness of the right hypochondrium, it is necessary to suspend the oil, lighten the diet of the patient, and give blue pill or calomel with an aperient on alternate nights, and an effervescing saline two or three times during the day. A few days of this treatment will generally set the stomach and liver to rights, and the oil may be resumed, beginning with small doses as at first. In all cases during the use of the oil the bowels should be kept regular in action ; and if this cannot be done by regularity of habit and diet, it should be effected by the use of a mild daily pill of rhubarb or aloes.

Such are the directions which have proved most effectual in the administration of a remedy which may truly be said to have so much altered the prospects of the consumptive as to give hope of cure in not a few, and of much prolonging life in by far the greater number. But to induce patients to follow these directions, and to overcome their aversion to a remedy which the prejudice of some represents as disgusting, and the experience of many may find trying to continue for so long,—the practitioner will often find it necessary to use all his powers of argument and persuasion. The great plurality of patients are amenable to reason, and are willing to follow any advice that is given with *confidence* and *clearness*. To those who demur or rebel it is generally expedient to tell the plain truth—that they have a serious disease, pretty sure to increase, and sooner or later to destroy life, if left to itself ; but *here is the remedy*—the only one worthy of the name, which if carefully and faithfully used may arrest and cure the disease, and is pretty sure to retard it and prolong life more than any other known means. If the physician believes this himself he will rarely fail to carry his patients with him. I believe it firmly, and I rarely fail to make the patient take the oil, and to persevere with it, in the experience and conviction that it is essential to his well-being and improvement. The proportion of recusants, either from waywardness of temper, fastidiousness of taste, or from intolerance of stomach, altogether does not exceed five per cent.

Although my long experience assigns to cod-liver oil a place far above all other remedies in the treatment of pulmonary consumption and its allied maladies, it has taught me to believe also in the limited efficacy of certain other agents, and it would not be fair to pass these over in this brief summary of treatment.

I have already mentioned a combination of iodide of potassium and nitric acid with a vegetable tonic, as having distinctly wrought some good in consumptive cases before the pure oil was introduced. I still sometimes use this medicine in the rare cases in which cod-liver oil disagrees or cannot be taken, and I think that it is improved by the addition of a drachm or two of pure glycerine to each dose. Glycerine by itself is of little use, but it is valuable as a lubricant, and to sheathe the acrimony of mineral acids and other pungent medicines.

The hypophosphites of soda and lime, so strongly recommended by Dr. Churchill, of Paris, have in my hands proved decidedly beneficial in certain cases. They have been tried by Drs. Quain and Cotton, at the Brompton Hospital, with only negative results ; but having met with several patients who distinctly ascribed their improvement to Dr. Churchill's treatment, I have thought it right to try them myself, both as a substitute for the oil and in addition to it. In the former way the results have not been generally satisfactory : the hypophosphite does not disagree, but there is no marked improvement as under the oil ; and when they have been doing well under the oil, the patients generally lose flesh and strength when the hypophosphite is substituted for it. On the other hand, it has happened to me in several cases that a patient has long been taking the oil, and, after having derived great benefit from it, halts in his improvement, or even loses ground, and then the addition of the hypophosphite has been followed by a marked change for the better ; flesh and strength have been gained, and the chest symptoms have been more or less improved. In these cases I have merely added four or five grains of the hypophosphite to the vehicle in which the oil is given, always selecting the phosphoric as the acid, and generally substituting glycerine for the usual syrup. Such precautions are necessary, because the hypophosphites are very unstable in composition ; the addition of nitric acid, or mere exposure of the solution to the air (if not guarded with glycerine or a good deal of syrup), being sufficient to convert them into inert phosphates. In my mixture of the hypophosphite with phosphoric acid, I presume the hypophosphorous acid is set free, and is the active agent in the compound. How it acts is quite uncertain. I cannot say that I agree with Dr. Churchill's views on the subject, even if I understand them. These hypophosphites seem to increase the failing powers of respiration and circulation. Can this be by increasing the affinity of the blood for oxygen, so that it can attract it and maintain the blood-changes even under the increased difficulties and obstructions produced by disease ?

Perhaps the efficacy of the sulphurous acid—Dr. Dewar's remedy for consumption—may depend on an influence not altogether unlike that of the hypophosphites. My experience of the use of the spray of sulphurous acid is limited in phthisis, and as far as it has gone has not been very encouraging. But I have found the spray a most useful and agreeable remedy in various affections of the throat, whether diphtheritic or aphthous ; and it has proved cleansing and soothing in some cases of foul ulceration of the throat, affecting both larynx and fauces, generally syphilitic in origin, and sometimes ending in pulmonary consumption.

In connexion with this subject, I most notice remedies administered by inhalation, which are really useful in certain cases, chiefly those in which the larynx and trachea are much affected, and in those attended with convulsive cough or offensive expectoration. I have generally found the use of inhaling instruments fatiguing and unnecessary. A quart jug of hot water, with a napkin from over the nose down to and around the jug to confine the steam, is all that is needed. To the hot water is added the drug to be inhaled ; and creasote or carbolic acid, iodine, chloroform, oil of turpentine, and juice or extract of hemlock, are the articles which I have found most beneficial. A few drops of one, or of several of these combined, being put into the hot water, the inhalation is practised through both mouth and nostrils without restraint or difficulty, and may be continued for five or ten minutes every night, and, if need be, repeated once or twice in the day. Although the chief operation of this medicated vapour is on the guttural and bronchial surface, yet a portion penetrates into the lungs, and is absorbed into the system ; for iodine and oil of turpentine can be detected in the urine within a few minutes of the inhalation being made. Still, although proving very serviceable in certain cases, I cannot rank inhalation higher than as a subordinate remedy in the treatment of consumption. I may add, that the practice of painting the chest with tincture of iodine every night, as a gentle counter-irritant, is not without a certain influence in the way of inhalation ; for a portion of the iodine evaporates, and slightly impregnates the air around the patient, and this atmosphere of iodine may not be without its influence for good.

The sulphurous waters of the Pyrenées are highly recommended by the French physicians in the treatment of consumption ; and a few of my patients, after wintering at Pau, have found some benefit from the waters of Eaux Bonnes and Caunterets during the summer months. But in other cases, and these the greater number, more harm than good has resulted from their use. More or less excitement of the circu-

lation and respiration is generally induced by the sulphur waters, and instead of inducing expectoration and subsequent relief to the cough and breathing, the critical improvement has not taken place, and the patients have come away weaker and more oppressed than they went. With all respect for our brethren across the Channel, so far as regards their cleverness in diagnosis, I do not hesitate to say that they are far behind British practitioners in their skill and success in the treatment of disease in general, and of diseases of the chest in particular. The same remark applies pretty much to the German doctors and their water cures, whey cures, and grape cures. Except in a few instances with the waters of Ems, I have hardly known any British pulmonary invalids derive any permanent benefit from these modes of treatment; but I quite admit that they are sometimes useful when the pulmonary disease is complicated with gout, or decided disorder of the liver and digestive organs.

Of far more importance in the treatment of consumption is change of air and climate. It is of the greatest consequence to the phthisical invalid that he should breathe as pure an air as possible, and that the influence of this pure air on the blood and on the body should be increased by such gentle and varied exercise in it as his strength and the condition of his organs will permit. This is the great object of our sending him to a warm climate in winter, and to a high and dry locality in the summer, that he may be as much as possible in the *open air*, with its exhilarating and vivifying accessories of light, purity, and freshness, without the chilling operation of cold and wet in the winter, and the enervating and exhausting influence of oppressive heat in the summer. I cannot in this place pursue this important subject into the details of its application to the different forms and stages of disease, and the varieties of air and climate most suitable for them; but I may refer to my son's little work on climate* for concise information on these points. I would only add further, in conclusion, that several of the most successful cases which have been recorded in these papers are illustrations of the great benefits to be derived from well-directed voyages and change of climate, in addition to the treatment which has been summarised in the present pages.

In conclusion, I trust that the preceding papers have proved what I stated at the commencement: that, powerless as medicine is in the overwhelming and rapid types of pulmonary consumption, it has yet considerable influence over the milder forms; and *that under careful treatment life may be prolonged for many years in comfort and usefulness, and in not very few cases the disease is so permanently arrested that it may be called CURED.*

OPERATION FOR STRANGULATED HERNIA; ARTIFICIAL ANUS FOR WEEKS, AND ULTIMATE CURE.

BY A. J. MACKINTOSH, M.D.

ON the 7th of April last I was requested to visit Mrs. C—, of this town, who was suffering from strangulated hernia. Mr. T. G. Wales was then attending her as a private patient, but she was now transferred to me as a pauper. Mr. Wales called upon me in the morning, and acquainted me with the nature of the case and treatment adopted. The ordinary means failed to produce any beneficial effects on the hernia; hence the expediency of having recourse to an operation; besides, the symptoms were growing so urgent that immediate relief was imperative.

In a short time afterwards we operated, having the valuable assistance of Mr. J. K. Hyde. The patient is forty-eight years of age, and the mother of thirteen children; had double hernia for three or four years. She has a delicate constitution, but is neither excitable nor nervous.

The hernia was oblique inguinal on the left side, large and very hard, so much so that no appreciable impression could be made on it by manipulation; this was owing to firm adhesions. She vomited stercoraceous matter shortly before the operation. The pulse was above 120 at the wrist, very weak, and almost imperceptible; in fact, she was so prostrated and so exhausted that we considered it prudent to operate without the administration of chloroform.

When I commenced the operation I found the skin so closely and so firmly adhering to the hernia coverings that I was unable to pinch it up; consequently, I was compelled to divide it by directing the edge of the scalpel inwards. After dividing the integuments, the aspect of things appeared very unfavourable, either for a satisfactory operation or successful issue. The investing textures of the hernia were one agglutinated mass of adhesions; also, structural change had advanced to a considerable extent. Some parts were bluish-black, other parts having either a brownish or greenish hue, and rapidly decomposing.

To dissect in their order all the different layers which constituted the hernial envelopes was utterly impossible, as they were connected by false membranes into one inseparable and undefinable structure. After dividing a few false and fibrous membranes, we discovered three small perforations in the most prominent part of the hernia; and from these perforations fecal matter escaped, and was more or less diffused into the adjacent tissues. This manifestly indicated that a certain portion of the intestine was destroyed. Such being the case, we had no alternative but to make the three openings into one, thereby constituting an artificial anus. When that was accomplished, a large quantity of the contents of the bowels escaped freely.

During the first twenty-four hours subsequent to the operation, immense quantities of fecal matter came away through the wound. She progressed remarkably well under the existing circumstances, the new anus answering its purpose well, the motions passing regularly through it without much pain.

On the 13th of April (a week after the operation) I was surprised, on calling in the morning, when she informed me that during the previous night she endured severe pain in the lower part of the abdomen, and that she had a natural motion per rectum just one hour before my visit. She described that motion as "resembling a lot of marbles." I doubted the accuracy of her statements, and questioned the nurse to elicit the truthfulness of her remarks, and, to my no small astonishment, found that she corroborated her assertions. At the time, I believed that the peristaltic action of the intestines was restored, and that the contents evacuated were merely lodged in the anal side of the hernia. However, the sequence will show that other important changes occurred besides what I surmised.

On the 23rd of April she had a large motion per rectum, causing little or no pain. At the same time motions were passing daily through the artificial opening.

On the 1st of May she had another free evacuation through the natural passage, and, strange to say, since that date she had daily motions through the natural channel.

When the function of the normal passage was fairly restored the artificial wound gradually closed, and is now completely obliterated, devoid of either discharge or secretion, a little induration and a cicatrix representing the former situation of a hernia and an artificial anus. The patient is now attending to her domestic duties, absolutely free from any pain or suffering. She wears a truss over the hernia on the right side.

I cannot explain the peculiar change that occurred in this very singular and unique case after the operation, except on one hypothesis—that is, that the front half of the strangulated portion of the intestine was destroyed, permitting fecal matter to escape through it, the other or posterior half being entire and healthy, allowing certain quantities of matter to pass through it also; thereby keeping the calibre of the canal patent, while the greater amount was carried off by the other opening.

It is evident that nature repaired the injured parts most beautifully and successfully by patching the wound with false membranes and adhesions. When this woman dies, a post-mortem examination would disclose very curious and interesting facts in her case. It would be highly satisfactory to ascertain the primary state, and amount of mischief to the various parts that were involved by the hernia; also the manner in which nature healed the wound and kept the intestinal canal open. The exquisite powers of nature are truly wonderful in protecting and saving life in cases that appear to be beyond hope of recovery.

I am not aware that a similar case to this is recorded in the annals of surgery; therefore I am the more anxious to describe it in all its particulars.

Downham Market, Norfolk, July, 1868.

DEATH OF MIDDELDORPFF. — This eminent man, who has shed so much lustre on his professorial chair at Breslau, has just died at the early age of forty-four.

* The Climate of the South of France and its Varieties most suitable for invalids. By Charles Theodore Williams, M.B. Oxon. 1867.