obtained; in another case, there was greater tolerance of food, and more comfort after it, than with the use of simply diluted milk. It would be interesting, also, to have experience of the use of peptonised aliment in typhoid fever and in old age. The greater variety which can now be given to this form of food by the preparation of peptonised soups, jellies, and blanc-manges, will obviate the monotony sometimes complained of under the continuous use of peptonised milk-gruel.

THE USE OF PANCREATIC EXTRACT AS AN ADDITION TO FOOD SHORTLY BEFORE IT IS EATEN.

The administration of pancreatic extract with or immediately after a meal can, I think, have only a limited utility. On entering the stomach, the pancreatic ferments encounter the acid of the gastric juice; and, when this rises above a certain point, the activity of the ferments is destroyed. Still a not inconsiderable interval of time must elapse before this point is reached; and during this interval the pancreatic ferments can accomplish a certain amount of work. I have repeatedly administered pancreatic extract in this way; but I am unable to say positively that I have seen benefit from this mode of administration. There is, however, a modification of this plan, which I have lately put in practice, that promises better results. It is to add the extract to the food fifteen or twenty minutes before it is eaten. Certain dishes commonly used by invalids—farinaceous gruels, milk, bread-and-milk, milk flavoured with tea or coffee or cocoa, and soups strengthened with farinaceous matters or with milk—are suitable for this mode of treatment. A teaspoonful or two of the liquor pancreaticus should be stirred up with the warm food as soon as it comes to table. And such is the activity of the preparation that, even as the invalid is engaged in eating—if he eat leisurely, as an invalid should do—a change comes over the contents of the cup or basin; the gruel becomes thinner; the milk alters a shade in colour, or perhaps curdles softly; and the pieces of bread soften. The transformation thus begun goes on for a time in the stomach; and one may believe that, before the gastric acid puts a stop to the process, the work of digestion is already far advanced.

This mode of administering pancreatic preparations is simple and convenient. No addition of alkali is required, and of course no final boiling. The only precaution to be observed is that the temperature of the food, when the extract is added, should not exceed 150° F. (65° C.). This point is very easily ascertained; for no liquid can be tolerated in the mouth, even when taken in sips, which has a temperature above 140° F. (60° C.). If, therefore, the food is sufficiently cool to be borne in the mouth, the extract may be added to it without any risk of injuring the activity of the ferments.

Pancreatic Extract as an Addition to Nutritive Enemata.—Pancreatic extract is peculiarly adapted for administration with nutritive enemata. The enema may be prepared in the usual way with milk-gruel and beef-tea; and a dessert-spoonful of liquor pancreaticus should be added to it just before administration. In the warm temperature of the bowel, the ferments find a favourable medium for their action on the nutritive materials with which they are mixed; and there is no acid secretion to interfere with the completion of the digestive process.

I have now had some experience in this method of alimentation, and have been satisfied with its success. In one case, a patient suffering from postpharyngeal abscess which entirely occluded the œsophagus, was nourished exclusively for a period of three weeks (until the abscess broke) on enemata or milk-gruel mixed with pancreatic extract.

OCCLUSION OF THE LARYNX: INTERNAL LARYNGOTOMY.—Professor K. Störk relates, in the *Wiener Medizinische Wochenschrift* (No. 46, 1879), the case of a boy aged 7, who three years previously had diphtheria, for which tracheotomy had been performed, and he had since worn an unfenestrated cannula. Some time after the operation, he was brought to Dr. Störk in consequence of having become dumb. Laryngoscopic examination showed a normal condition of the parts as far as the interior of the larynx; beyond the vocal cords, a *cui-de-sac* was noticed. The vocal cords moved, but without sound; there was a remarkable absence of secretion. Dr. Störk diagnosed complete adhesion of the cricoid cartilage. On examination with a small tracheal speculum, a wall of mucous membrane was found to have been formed between the larynx and trachea, arching over the latter like a dome. Dr. Störk consequently resolved to perform internal laryngotomy. For this purpose, he used a knife one-fifth of an inch long, set at a right angle to the hand, with which he carefully divided the adherent parts from below upwards and from behind forwards; this having been done, a specially constructed dilating apparatus was applied. There was little hæmorrhage during the operation; and the only difficulty arose from the narcosis. After the operation, the laryngeal opening having been dilated and the tracheal opening closed, the patient was able to speak.

THE CROONIAN LECTURES ON SOME POINTS IN THE PATHOLOGY AND TREATMENT OF TYPHOID FEVER.

Delivered before the Royal College of Physicians of London.

By WILLIAM CAYLEY, M.D., F.R.C.P.,

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LECTURE III.*

WE may divide the symptoms of typhoid fever into two classes: first, those due to the general febrile state; secondly, those depending on the local lesions. With regard to the former, we may distinguish those cases where the treatment has been applied from the first, and the fever prevented, as it were, from getting the upper hand, and those where it has not been resorted to till all the symptoms of the typhoid state have been allowed to become fully developed. In order to show the effect which we not unfrequently obtain, even in the latter class, I will briefly narrate a case which has recently been under my care.

Arthur C., aged 22, was admitted into the Middlesex Hospital on the afternoon of November 17th, the twenty-first day of his illness. On October 26th, he had been attacked by rigors, followed by the usual symptoms of fever; and on the 29th, he took to his bed. On the following day, diarrhoea appeared. On November 2nd, he became delirious, and had so continued more or less till his admission. The case then seems to have been a very severe one from the first. The onset was sudden; the patient took to his bed on the fourth day, and became delirious on the eighth.

On admission, he was very prostrate, and in a state of stupor, from which, however, he could be roused by loud speaking. Pulse 144; temperature 104.6°. My clinical assistant ordered him to be sponged with cold water; and at 6 P.M., the temperature being still 104°, gave him twenty grains of salicylate of soda. The temperature fell to 102.2°; but at midnight was again 104°. He now administered thirty grains of quinine; this caused vomiting, which continued during the night. (I may say I never give these remedies, under such circumstances, where there is much stupor; far better results are obtained by bathing, with less risk of causing unpleasant symptoms.)

When I saw him at ten the next morning, he was in a state of profound stupor, from which he could not be roused; his face was livid and dusky, pupils dilated, muscles tremulous; pulse so small and irregular that it could not be accurately counted, but was about 160; respirations 36; temperature 103°. There were fine crepitant *râles* audible all over the chest, extending to the apices.

I ordered him a pint of champagne and eight ounces of brandy daily, and a mixture of hydrocyanic acid and soda to check the vomiting (which it did not do), and directed him at once to be put into a bath at 65°. He remained in it for fifteen minutes, and when taken out was shivering violently. This I regarded as a favourable sign, as it indicated that the nervous system retained its powers of reaction. At mid-day, he was still shivering; and though still in a state of stupor, his general appearance had improved. At 2.15, the temperature having risen to 104°, the bath was repeated at 70° for ten minutes, and again at 4 P.M.; but this last had so little effect that another was given an hour later. At 7 P.M., a fifth bath was given; and at 11 P.M., a sixth. This frequent repetition was necessitated by the rapid rise of temperature and the recurrence of the alarming coma. During the day, he vomited everything he took. Feeding by the mouth had to be desisted from, and an enema of beef-tea, brandy, and opium, was administered every three hours.

At 3 A.M. on the 19th, a seventh bath was given; and at 6 A.M., an eighth. When I saw him in the afternoon, his condition was manifestly improved; the stupor had passed off; he put out his tongue when told, and tried to speak; the vomiting had ceased. Pulse was now 132, of better quality; temperature 101.6°. From this time, a slow but steady improvement manifested itself, but the temperature continued to rise a few hours after each bath, and they had to be repeated at gradually increasing intervals. Thus, during the first twenty-four hours, eight baths were given; during the second twenty-four hours, also eight; during the

* Continued from page 613 of JOURNAL for April 24th.

third, six; during the fourth, four; and they had to be occasionally given up to November 30th.

His recovery was much retarded by the state of his lungs, which were very slow in clearing up. Not only was there universal capillary bronchitis, but also, no doubt, lobular pneumonia, for, when the stupor passed off, he began to cough and to bring up characteristic rusty sputa; but, from his great prostration, it was impossible to examine the bases of the lungs with any accuracy.

I may say that, in this case, the urine was highly albuminous; but, as the temperature fell, the albumen gradually decreased, and had quite disappeared before the baths were finally left off.

In the autumn of last year, I had the satisfaction of successfully treating in this manner a member of our own profession. Here the symptoms were also of extreme gravity—delirium, stupor, universal muscular twitchings, not only of the extremities, but also of the face, inability to protrude the tongue, accumulation of mucus in the bronchial tubes, an irregular pulse of 140, and albuminuria.

This gentleman's father, himself a physician of large experience in the treatment of fever, when the cold baths were proposed, said he had a horror of them; but the effect of the first bath was completely to convert him, and he afterwards encouraged me to persevere when, from the patient's extreme prostration, my own resolution had begun to fail. In this case, the temperature was never very high, only once reaching 104° in the axilla.

Such, then, are the effects which we sometimes obtain from the baths when they are resorted to in the later stages of the disease; but such results must necessarily be exceptional. We ought, therefore, rather to aim at preventing patients from falling into this condition, than trust to the very doubtful chance of rescuing them from it. Now, all observers who have tried this mode of treatment agree that, when it is applied from the first, and the temperature steadily kept down by any of the modes I have mentioned, these so-called typhoid symptoms—the febrile oppression, the delirium, the stupor, the subsultus, the fuligo, the dry brown tongue—do not occur at all, or at any rate in a much slighter degree.

We have now to consider the effect of the persistent reduction of temperature on the local lesions, and especially the intestinal sloughing and ulceration to which the fatal event is so often due, usually from hæmorrhage or perforation, sometimes more indirectly from inducing a state of marasmus.

With regard to perforation, we must distinguish between the two main forms of this complication. In the first place, we have the early perforations which take place during the detachment of the slough, and which usually occur during the third week, sometimes as early even as the twelfth or fourteenth day. These are due to the typhoid infiltration extending into and through the muscular coat, so that, when mortification takes place, the peritoneal covering, whose nutrition depends on the integrity of the subjacent tissues, itself dies and becomes detached. In examining the intestines of patients who have died at this period of the disease, I have frequently observed small patches of the peritoneum, corresponding to the infiltrations, to be slightly opaque and yellow; and sometimes, in washing the intestine with a stream of water, these opaque patches of peritoneum will separate, exposing the subjacent infiltrated tissue. The perforations which thus occur from separation of the primary slough are often of very large size, so that one may sometimes even put the tip of the finger through them.

The later perforations, which are liable to occur at any time after the separation of the sloughs up to the establishment of complete convalescence, are due to the typhoid ulcers not granulating, but becoming atonic and gradually extending. These later perforations are generally very minute.

Now, whether the ulcers granulate and heal, or pass into the atonic state, depends chiefly on the general condition of the patient; and the less his system has been shattered and his tissues degenerated by the febrile process, the less likely is this complication to occur. Hence, any mode of treatment which lessens the injurious effects of the fever cannot fail also to diminish the frequency of these later perforations.

With regard to the early perforations, which are due to the depth to which the typhoid infiltration has gone, the effect of reducing the temperature is less obvious; and if the process is to be influenced at all, it is evident that the treatment must be applied from the very commencement of the disease, and, when this is done, Dr. Brand alleges that these complications never take place, and he has now treated in private practice 211 cases in succession without a single death or the occurrence of these accidents; but after the first few days, whatever good effects the bathing may have on the fever, the control of the typhoid process on the bowel is lost, and the infiltration and sloughing will run their course unchecked.

Arterial hæmorrhage may, like perforation, be divided into two

classes—the early and the late; and their pathology and causation exactly correspond.

On the whole, the effects of the antipyretic treatment appear to me to be most favourable where the general febrile symptoms predominate over the local intestinal symptoms, and least favourable where the latter predominate over the former; but, according to the experience of Dr. Brand, provided the treatment be begun at the very outset of the attack, an equally favourable effect is produced on both.

Granting, then, the general efficacy of the antipyretic treatment, we have next to consider whether it be adapted to all cases, and ought to be indiscriminately applied. To this, I think, we must answer that under no circumstances ought we to allow the temperature to maintain itself continuously above 102°. But the means employed to reduce it must vary with the condition of each case.

The most efficacious and most generally applicable of these methods—the cold baths—may be inadmissible. Sometimes the patient cannot bear them; they may cause a dangerous depression, or even syncope. As a rule, persons advanced in life and of impaired constitution are less able to support the baths; but these are the cases in which it is especially important to prevent the injurious effects of the temperature. If necessary, then, we must have recourse to the graduated bath, to cold packing, cold sponging, cold compresses, together with quinine and digitalis. The cold bath may likewise cause other unpleasant symptoms, as cramps and neuralgic pains. I have recently had under my care, in the Middlesex Hospital, one of the nurses, in whom the early symptoms were extremely severe. The temperature on the third day exceeded 105° in the axilla, and it was with great difficulty controlled. She had twelve cold baths; but the last two caused very severe neuralgic pains, principally in the sciatic nerves; so that they had to be discontinued, and we were compelled to resort to the graduated bath, sponging, packing, and quinine in thirty-grain doses; and by these means, after the obstinacy of the temperature had been broken, as it were, by the repeated cold baths, we succeeded in keeping it under.

Another question of great importance is whether pneumonia, bronchitis, and congestion of the lungs are induced or rendered more severe by bathing. I think that to this question we may give a negative answer. In typhoid fever, the former are probably due to the action of the poison, and the hypostatic congestion to the failure of the heart; and they are usually manifestly benefited by reducing the temperature. With regard to pneumonia, it is now the common practice in Germany to treat the idiopathic form of the disease in the same manner, and with excellent results.

Cold baths are generally regarded as contraindicated in those cases where the patient is the subject of venous congestion from chronic bronchitis, emphysema, or cardiac disease. Dr. Glénard gives an interesting case of a man aged 53, one of the male nurses in the hospital at Lyons, who had been employed in bathing the typhoid cases, and was himself attacked. This man suffered from chronic bronchitis and emphysema, but was so convinced of the advantages of the bathing treatment that he insisted on its being applied to himself; and he took sixteen baths, but the later ones produced such alarming suffocative attacks that they had to be discontinued. He ultimately made a good recovery.

The occurrence of profuse intestinal hæmorrhage and of peritonitis is an absolute contraindication to bathing, which indeed has been accused of rendering the former complication more frequent by inducing congestion of the intestinal mucous membrane and increasing the blood-pressure in the arteries. Whether it really produces these effects is, however, very doubtful. Dr. Glénard performed the experiment of exposing and opening the intestines of rabbits, and then immersing the animals in cold baths, taking care that the water did not come into contact with the intestine; and the effect was to blanch the mucous membrane. I need hardly say that we are constantly in the habit of treating internal hæmorrhages on the principle that the external application of cold causes a reflex contraction of the vessels of the subjacent viscera. In hæmorrhage from the lungs, we apply an ice-bag to the chest; in hæmorrhage from the stomach, to the epigastrium; in hæmorrhage from bladder or uterus, to the hypogastric region; and no doubt with good results. In all probability, where the general surface is cooled, as by a cold bath, the blood tends to accumulate in the muscular layers of the body, rather than in the external organs. Statistics also show that bathing does not increase the frequency of hæmorrhage. The reason why hæmorrhage renders bathing inadmissible is the necessity of keeping the patient perfectly at rest, lest by any movements we should displace coagula or increase the rapidity of the circulation. In these cases, then, we must arrest the peristaltic movements of the intestine by opium, apply iced compresses to the abdomen, administer styptics, as ergotine and digitalis, which latter also has the advantage of lower-

ing the temperature. If, in spite of the hæmorrhage, the temperature again rise, we can give quinine and sponge the patient with cold water. In peritonitis, rest is still more more imperative, and we must have recourse to the same remedies, with the exception of the styptics. Very commonly, however, both hæmorrhage and peritonitis themselves induce great depression of the temperature.

[To be concluded.]

ABSTRACT REPORT OF LECTURES ON THE COMPARATIVE ANATOMY OF MAN. *Delivered at the Royal College of Surgeons of England.*

By W. H. FLOWER, LL.D., F.R.S.,

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LECTURE VI.—THE RACES OF AFRICA (*continued*).

VARIOUS statements have been made by travellers regarding the size and shape of the hands and feet of the Negro; but none of them are sufficiently accurate to be of much use to the anthropologist. The relative length of the toes is a characteristic which might mark a difference between Europeans and Negroes. The great toe is usually the longest toe in the foot of an European, and the others recede progressively; whereas in the Negro the second toe is, as far as the material at our disposal shows, generally slightly the longest. This is an approach to the form of foot in the higher apes, as in them the second toe is decidedly longer than the great toe. The foot, therefore, in which the great toe is longer than the other, is of a higher type. It would be well, however, if we could get some further information on this point, as we are not in a position to state with accuracy the relative lengths of the toes in the Negro races.

The difference between the pelvis of the African Negro and that of the European has been pointed out by Vrolik and others. It consists mainly in the increase of the antero-posterior diameter, as compared with the transverse, expressed by the pelvic index or ratio between these diameters, the latter being taken as 100. In the European male, the average index is 80; in Negroes, according to various observers, from 90 to 100. As in the proportions of the limbs, many of the Mongoloid races conform, in the character of the pelvis, rather with the Negro than with the European.

In the cranial characters, the distinctions between the Negro and white races are strongly marked. The skull of the Negro is thicker and heavier generally than that of the European; and the average capacity of the cerebral cavity is undoubtedly smaller in the former, even in individuals of approximately the same height. It is, however, considerably higher than in the Australians. The difference between the average capacity of English and Negro crania in the College museum is 123 cubic centimetres; between the latter and the Australians, 90 cubic centimetres. Of fifteen male English skulls (mostly of the lowest and least intellectual grade of society) in the College museum, the cranial capacity is 1,511 cubic centimetres; of thirty-two male Australians, it is 1,298 cubic centimetres; and of twenty-six Negroes, it is 1,388 cubic centimetres. Broca's totally independent measurements of skulls at Paris give a difference in the former case (Parisians being substituted for English) of 128 cubic centimetres, and in the latter of 83 cubic centimetres; so that the results are substantially identical. The general form of the cranium is expressed by the cephalic or latitudinal index, or relation of the breadth to the length, the latter taken as 100. The average index of forty-two Negroes of various tribes in the College museum is 73.6. Of these, more than half are between 70 and 75, or dolichocephalic; less than half are above 75, or mesocephalic; but very few are either below 70 or above 80. The average index of eighty-five Negroes from the West Coast of Africa, measured by Broca, is 73.4; and of fifty-three from East Africa, measured by Lederle, 73.9. These remarkable agreements with our own measurements show that between 73 and 74 may be fairly taken as a general average of the cephalic index of the African Negro; and that he belongs, therefore, to the moderately dolichocephalic races. The height, measured from the basion to the bregma, is almost identical with the breadth of the average of the forty-two College specimens, giving 73.5. The Negro skull, in these proportions, differs greatly from that of the Fiji

islanders described in the first lecture. The skull is rounded on the top, and not sloping off laterally like the roof of a house, as in the Australians. The sutures are simple, but more complex than in the Australians, and the temporal fossæ are deep. The differences in the position of the foramen magnum, in the angle formed by its plane with the horizontal of the skull, and in the various facial angles which have been pointed out as characterising the Negro skull as compared with that of the European, can only be explained by means of diagrams. The facial characters are generally eminently characteristic. The forehead, though narrow, is not retreating. The glabella and supraorbital ridges are sometimes well developed; but more usually this region is smooth and flat. The orbits have a moderate index—85.5 (Broca), or 86.3, according to measurements of the College collection. The nose is distinctively platy-rhine, the average index being 55 or 56. The nasal bones are small and flat; their external surfaces directed forwards, the two meeting in front at a very open angle, instead of a narrow one as in Europeans. The lower margin of the nasal aperture is usually rounded off, instead of sharp and strongly defined. Equally characteristic is the prognathism, which is very rarely absent. The measurement from the basion to the middle of the alveolar border is greater than that from the basion to the naso-frontal suture (the cranio-facial axis); whereas in Europeans the reverse is the case.

The teeth are regular, well developed, and generally free from caries. The third molars, or wisdom-teeth, appear to be always in their places before the closure of the basilar suture, whereas among civilised races they are often much later in coming into place. The size of the teeth varies in different races; but hitherto no accurate measurements have been made to express this difference. The length of the molar series in a straight line between the anterior edge of the first premolar and the posterior edge of the third molar may be conveniently used to indicate the size of the teeth, and called *d*. This may be compared with the length of the cranio-facial axis or basi-nasal length $\frac{d \times 100}{BN}$. This will give, at all events, a fair approximation to the relative size of the teeth, compared with the skull, as the length BN is one of the least liable to variation of any in the cranium. Unfortunately for this investigation, in a large proportion of the crania in museums, the teeth are wholly or partially lost, and a larger number of specimens must be measured than are at present available. The following indices (which must be regarded as provisional) are, however, of considerable interest. In the first place, it must be observed that the teeth of women, though smaller absolutely than those of men, are relatively larger to the cranio-facial axis. For instance, in Europeans, the dental index of males is 40.5; of females, 42.0. In Australians, the disproportion is greater still, being 45.7 for the males and 48.4 for the females examined. In the following table, males only will be included: Europeans, 40.5; ancient Egyptians, 40.8; Hindoos, 41.2; American Indians, 42.5; Chinese, 43.8; African Negroes, 43.9; Andamanese, 44.2; Fijians, 45.4; Australians, 45.7. It will thus be seen that, in the size of the molar teeth, the Negroes hold an intermediate position between Europeans and Australians, but approaching nearer the latter. The actual average length of the molar series in European males is 40.8 millimetres; in Africans, 45.4 millimetres; in Australians, 46.7. The anthropoid apes give a higher index than that of any of the races of man.

ALCOHOL IN FEVER.*

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I INTEND these few remarks to be essentially practical, giving rather the results of my individual bedside experience than broaching any original views or theories with regard to this important question. Independently of private cases, I have treated in the Cork Fever Hospital, from January 1873 to June 30th, 1879, 899 cases of fever, meaning by fever, typhus, typhoid, and simple continued fever. I commence at this date, for it was in this year that I first determined to watch carefully the effects of digitalis in fever, and learned to abandon the too generous use of alcohol; nay more, to administer it only in a certain percentage of cases, in which the indications for its employment are clear, and when the responsibilities of withholding stimulants would be infinitely greater than that of administering them. I have since been most careful in ordering brandy or wine of any kind in fever. My views of the value of alcohol I shall, having read these tables, briefly summarise.

* Read in the Section of Medicine at the Annual Meeting of the British Medical Association in Cork, August 1879.