

staining for spores we were unable to decide whether or not these refractive bodies were spores. However, in old, dried-up cultures there is to be found nothing but the round or oval forms of the micro-organism, which has a great resisting power to heat and many of the antiseptic solutions.

THE MANAGEMENT OF SUMMER DIARRHEA.*

THOMAS S. SOUTHWORTH, M.D.

Attending Physician Nursery and Child's, New York City Children's
and Minton Hospitals, Physician Out-Patient
Department Babies' Hospital.

NEW YORK CITY.

Trite as may seem the subject, the first hot days of the summer call up a picture of the blanched and sunken faces of the sad little army which besiege the doors of our offices, hospitals and dispensaries in the lifeless days of summer. It is a smaller army than of yore, thanks to the agitation for pure milk and the ever-widening knowledge of the proper methods of prophylaxis and treatment, but the work of such discussions as will follow this group of papers has not yet been done nor will be done until human ignorance or human life disappears from the earth.

ETIOLOGY.

Believe as we may concerning the preponderance of etiologic factors—bacterial, dietetic or meteorologic—the fact remains that diarrhea among infants and young children leaps to the front with the inception of the warm season, and claims our attention as the most common disorder until the cooler weather of the early fall forces it again into the background. It shall be the purpose of this paper to inquire into the advances made during recent years in the prevention and treatment of this scourge and to set them forth as clearly as may be.

In the search for etiologic factors, much that is of scientific interest has been compiled concerning the influence of sustained high temperature of the atmosphere in producing this affection. This influence is variously explained, either as favoring the development and multiplication of hurtful bacteria which may gain access to the digestive tract, or else so lowering, by its prostrating effects, the resistance of the individual host as to render him less able to cope with the invasion. Both factors doubtless play their parts, and since we can not influence the weather bureau, we must needs profit by the suggestions which they furnish for intelligent prophylaxis.

PROPHYLAXIS.

Prophylaxis, which, after all, is the supreme ideal of medical science, may well begin long before the summer opens, and many a life sacrificed might be saved by proper preparation for the ordeal which is to come; diet should be regulated and simplified, over-feeding in frequency and amount corrected, digestive difficulties of all grades, however slight, overcome, anemia and the protean gradations of malnutrition and rachitis actively combated.

Whenever it is possible children of susceptible age should be sent early into the country where the days and more especially the nights are relatively cooler than in the city. If such removal is not feasible as in

the vast majority of families, the coolest and best ventilated rooms should be chosen for their occupancy, clothing should be as light as is compatible with proper protection from sudden changes, they should spend as much time out of doors as possible in the daytime properly protected from the sun's rays, on the shaded side of the street, in public parks and open spaces, beneath trees or along water fronts, if these be accessible, and at night they should sleep in well-aired rooms. The functions and cleanliness of the skin should be promoted by the morning bath and evening sponging with cool or tepid water.

It may be stated as axiomatic that the healthy child is less susceptible to diarrhea, or if attacked, far more amenable to prompt and intelligent treatment. While all breast-fed children do not escape, the number affected of those who are exclusively nursed is relatively very small, and the numbers increase in proportion to the administration of other articles of food, whence the time-honored dread of the dangers not of the first, but of "the second summer."

METHOD OF INVASION.

Squalor, careless, improper and injudicious feeding and contaminated milk are probably accountable for most of the trouble. Squalid environment, which usually involves the other causes, furnishes many of our cases, but it should not be forgotten that bacteria may gain entrance to the digestive tract, even among the well-to-do in other ways than through bad milk and uncleanly nursing bottles, and that thumb-sucking and the use of rubber-sucking nipples or "baby pacifiers" should be discountenanced as serious elements of danger.

The investigation carried on among the poor of New York under the auspices of the Rockefeller research fund and published by Park and Holt show that the purer and cleaner the milk the safer it is in the summer months, but since this safety is one of degree only, and since milk produced under ideal conditions is obtainable in but few localities and often at a cost too great for general use, it is a safe and conservative position to assume at the present day that, unless we are assured of the absolute freshness as well as the cleanliness of the milk supply, and furthermore, unless there be some valid reason for the choice of raw milk, the milk for infant feeding during the summer months should be subjected early to pasteurization or sterilization, according to the particular prejudices of the physician, in order to guarantee reasonable hope of protection to the infant.

The term summer diarrhea has been employed purposely in the title of this paper, because while looseness of the bowels may arise at this season from many different causes, and at their inception with varying severity of symptoms, the great majority of them hold possibilities of later serious developments and call for radical and earnest treatment at the outset, at which time remedial measures are almost sure to be effective. There is the greater need of emphasizing this point, because those cases which at once show serious symptoms are naturally more alarming, and in consequence receive attention, while those of the slighter and milder degree are more often neglected until secondary infections have become engrafted, which are of vastly more serious import.

Thus much of the bowel disturbance of summer is purely dietetic and digestive, due either to some special indiscretion, or, as so frequently, to the inability

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of the child to digest, in hot weather, food with which on cooler days there was no apparent difficulty. Allow this, however, to advance a day or two without suitable treatment or change in diet, and the disturbed mucosa, secretions and contents of the digestive tract become a suitable field for the development of forms of bacteria which the system would readily cope with in health.

WITHDRAWAL OF MILK FROM THE DIET.

While uncleanly and infected milk is responsible for many cases, it is doubtless an error to ascribe all summer diarrheas to this cause, nevertheless it should be remembered that since milk is capable of superimposing additional disturbances in a considerable number of cases, it should be stricken from the diet for absolute safety. Although there are unquestionably exceptions to this rule, it may be asserted and reiterated with the utmost positiveness that no one of twenty remedial measures has such life-saving effects in summer diarrhea as the prompt and absolute withholding of milk and the removal of all milk residue from the digestive tract on the appearance of frequent disturbed stools. Could this one measure be made absolute in every household and institution of the country, the mortality from diarrheal diseases would become insignificant.

There are no reliable means of distinguishing the cases in which milk will or will not do harm. To give milk to the wrong child is to supply him with the materials for the elaboration of dangerous toxins and for the growth of countless myriads of destructive bacterial organisms. Were it proper to end this paper at this point, it would be with the firm conviction that the most important word had been spoken. It is not our good fortune, however, to see every case in the early stages, and there are other measures which must be carried out with intelligent understanding and common sense before the patient is restored to health.

Let us first have a clear appreciation of the conditions existing in the tract which we are to treat. If the diarrhea be of digestive origin we have a mucous membrane congested and irritated and a nervous and muscular mechanism endeavoring by increased and disordered action to throw off their contents, the by-products of whose faulty chemical processes are causing the disturbance by contact or absorption. If the difficulty be from contaminated milk, the process is only dissimilar in that the special bacteria which have been introduced multiply rapidly in the favorable medium and add their toxic products to the disturbance of the tissues and by absorption to the general system.

Continue but for a time these derangements of function, during which much of the natural protective power of the bowels is in abeyance and the bars are down for invasion of the intestinal wall itself by pathogenic organisms feebly or actively opposed by the rallying leucocytes, and mucous and submucous tissues suffer severely in their integrity, as so often happens to the hard-fought battlefield of contending forces.

There would be less hesitation in instituting rigid initial measures could every man study, microscopically and macroscopically, the intestines of some of these old neglected cases, swollen, congested, ulcerated, and see through the microscope the epithelium swept away, the mucosa and its glands eroded, and the blood vessels and lymph spaces choked with what were the bodies of the living, the dying and the dead combatants.

TOXIC SYMPTOMS.

We have thus far spoken chiefly of the intestinal symptoms, but what of the effects of the toxemia on the

rest of the body—the high temperature, the vomiting, restlessness, thirst, emaciation and prostration, the results of toxic absorption and of continued futile efforts to eliminate poisons which may be constantly recruited if milk be continued in the diet, and which directly or indirectly causes the death of the patient.

RATIONALE OF TREATMENT.

The picture given above is a common one enough, but before outlining a plan of treatment which is both simple and, if instituted early, usually effective, it will be well as a preliminary to set forth in plain terms what it is proposed to do and the reasons for so doing. The diarrhea, or diarrhea and vomiting, are no less than efforts of the digestive tract to rid itself as quickly as possible of something which it reflexly discovers to be hurtful. So long as that something remains in the body, the diarrhea is conservative, and any attempt to check it completely defeats Nature's purpose and is injurious. We should rather aid Nature in expelling it, and then, if necessary, assist in closing the flood gates which have been so rudely opened that the closing mechanism is out of order. Moreover, if the offenders be the teeming bacteria of spoiled or infected milk, not only must these poison-producing hordes be driven out, but no additional quantity of milk, however small or however disguised, should be allowed to reach the bowels until the whole brood has been exterminated, other forms of nourishment being supplied in which they do not multiply. Diarrhea with or without vomiting has not, however, arisen without considerable irritation of the organs concerned, which renders them incapable of immediately resuming their usual functions, and that which we supply in the way of nourishment must be of the simplest and blandest nature, until the whole system has recovered from what is really a serious shock, and the tone of the digestive apparatus shows that it is again restored by the subsidence of previous symptoms and the return of normal appetite. It must be evident, from what has just been said, that the earlier such rational treatment is begun the less injury will have been inflicted, and other things being equal, the earlier and more certain the recovery.

TREATMENT.

We have thus seen that the immediate indications for treatment in a case of summer diarrhea are of a triple nature, and every mother, nurse and physician should know them by heart. They are to stop milk and substitute a bland diet, to thoroughly clean out the digestive tract, and then, and not till then, employ means to check excessive peristalsis and secretion of the intestines.

Removal of Cause.—Castor oil and calomel are both efficient in sweeping out the bowel contents, and each has its special indications and advantages. Where improper and undigested food is known to be the cause or there be blood or much mucus in the movements, castor oil one to two drams acts promptly and relieves irritation. Where there is vomiting, intestinal decomposition or considerable temperature from absorption, and especially when the trouble has existed some time, calomel may be preferable in doses of 1/10 grain every half hour up to 1 grain. It is a gastric sedative and intestinal disinfectant, while it favors more normal hepatic action.

Lavage.—Where vomiting plays an important part gastric lavage with lukewarm water or solution of bicarbonate of soda (1 dram to 2 pints) may be most useful in cleansing the viscus.

Intestinal Irrigation.—I have found intestinal irrigation to be necessary less frequently than formerly, doubtless owing to rigid adherence to the rule of stopping milk at once, but it is of the utmost importance where the temperature is omniously high, the toxic symptoms pronounced, and in neglected cases. In conjunction with the administration of laxatives by the mouth, which should never be omitted, nothing compares with it when properly administered in promptness and efficiency in cleansing the colon and reducing high temperature. Plain water should not be used, but a normal salt solution (1 dram to 1 pint), employing a fountain syringe and a moderately firm catheter, number 14E or small rectal tube, introduced in the lithotomy position with hips elevated while the water is flowing, some nine or ten inches into the sigmoid flexure or beyond.

The irrigation should be thorough, at least two quarts being used, as it escapes at intervals beside the tube, and if the body temperature be high it may be cool, but if low and there be much weakness it should be warm. With much congestion evidenced by blood in the stools tannic acid (one teaspoonful to the quart) may be added with advantage. Irrigation gently and skillfully performed with an elevation of the reservoir of not over three feet does not increase prostration, but like other judicious hydrotherapeutic measures stimulates and soothes and is often followed by restful sleep. Retained fluid is, in part, absorbed greedily by the depleted tissues of the body and thirst is thus relieved.

Intestinal Sedatives and Disinfectants.—Medication of the disturbed digestive tract next demands our attention with the four-fold purpose of relieving irritation, restoring normal secretion, favoring disinfection and checking peristalsis, if excessive. The drug, which of all others has stood the test of time and experience in meeting the first three at least of these indications and often the fourth, is the subnitrate of bismuth, which is sedative, mildly astringent and disinfectant. It has the further advantage of being non-poisonous in the relatively large doses which are necessary. It is often given too timidly, and so ineffectually. Ten grains should be given every hour at first to children under one year of age until improvement occurs with the characteristic discoloration of the stools, then every two hours may be sufficient. It has been a matter of observation that where this discoloration, which is probably caused by the action on the bismuth of hydrogen sulphid in the bowel, does not appear in the stools, it is ineffective.

This may be remedied when required, as suggested by Kerley, by giving lac sulphur in grain doses. The frequency of the movements often subsides under bismuth treatment alone, but where the number of the stools exceeds six or eight in twenty-four hours, and particularly if they be fluid and large, special medication may be necessary. Opium fulfills this indication, and should be given separately, so that its dosage and frequency may be regulated independently of other remedies. Dover's powders $\frac{1}{4}$ to $\frac{1}{2}$ grain every two to four hours stand first, and paregoric, minims 5 to 15, second for this purpose. We repeat that high temperature and foul stools indicating retained toxic products forbid locking up the bowels.

DIET.

The dietetic treatment of these cases is of an importance second to none. Looseness of the bowels without temperature or vomiting in an exclusively breast-fed

infant may allow of a continuance of carefully regulated nursing, but in all other cases milk, even breast milk, should be withheld until the disturbance has subsided or its simple character becomes evident. It would hardly seem necessary to specifically include whey, cream mixtures, sterilized milk, condensed milk and cereal foods containing dried milk in this ban were they not so frequently employed in such emergencies under various misapprehensions. Barley water plain or much better dextrinized, has stood the test well as a bland nourishment which taxes but little the enfeebled digestive powers. Its nutritive value is not high, but it serves the purpose.

Children seem to bear this diet with less loss of weight and prostration, if there be added to each feeding one-half to one teaspoonful of some preparation of the liquid peptonoid type. A good substitute, if dextrinized barley water is refused, is rice water. If these are both refused, I do not hesitate to use egg albumin water (white of one egg to one pint of boiled water, strained and salted), with the addition of a little brandy or the peptonoid preparations. I am aware that albumin water is not approved by some authorities, but beyond the fact that if made too concentrated it produces more odor, doubtless of proteid decomposition in the stools, I have not recognized other drawbacks. Beef juice, which as an animal proteid, should be open to similar objection, is often useful, although occasionally too laxative, which is likewise true of broths which we often have to employ, especially with older children. In addition to the fluid diet given at prescribed intervals, plain water boiled and cooled should be given freely, since thirst is a common symptom, and because the maintenance of free renal secretions renders the patient less liable to kidney complications resulting from the elimination of the toxins.

To recur now to the more definite treatment of a given case, we will assume that the child receives dextrinized barley water, or a substitute, every two or three hours, according to its age. This diet should be maintained two or three or four days, or even longer, until the acute symptoms, such as fever, vomiting, frequent loose stools, etc., have subsided, and the visible improvement in the patient and a return of appetite give definite indication for a cautious return to a milk diet.

It is during this period that the anxiety and opportunity of the parents are most liable to overbear our judgment. In no class of cases is judicious starvation more important, or too early relaxation of our rules more disastrous. Breast milk may usually be resumed earlier than cows' milk, as easier of digestion, often on the second or third day, a few scattered nursings for short periods being first tried and these rapidly increased if there be no untoward symptoms. Cow's milk must be relatively longer withheld, and at the outset added to the other nourishment in small quantities, often only a teaspoonful to the usual bottle, never more than an eighth or a sixth of the whole, and the effect on the symptoms and stools carefully observed.

Experience teaches us to differentiate the gelatinous stool of barley water from one containing much mucus. It is a golden rule that appetite should always precede and exceed the amounts added. Several days should elapse of gradual increase in the strength of the food before it approximates that which the child took before the illness. It is often many days before the child can return to his old formula, and even then fat percentages frequently must be kept low lest they produce laxative effects. Some children must be kept on weak for-

mulæ until the end of the summer. In rare cases the addition of even small quantities of milk is not well borne until the cooler weather, and other forms of nourishment have to be continued in its place.

Severe and neglected cases may require stimulation in the acute period, with brandy or alcoholic solutions of peptones. Persistence of rather frequent loose or semi-solid stools, with fairly digested residue and with or without some mucus, but otherwise general improvement, if not readily overcome by the administration of opium, will often yield to 5 grains of tannalbin every four hours, or to three or four minims of dilute hydrochloric acid, combined with some digestive preparation. The routine use of some one of these digestive preparations may avoid disaster among the classes where we have reason to believe that the diet of the child will not be carefully guarded or our instructions for gradual resumption observed.

HYGIENE.

The hygienic rules which were laid down in the discussion of the topic of prophylaxis are of doubled importance in the treatment of the sick child. The patient should be bathed as often as required, not only for cleanliness, but for the reduction of fever, and for its well-recognized effects of quieting restlessness and improving cardiovascular tone. Fresh air and good ventilation should be insisted on in the sick room. In severe or desperate cases, if this is not possible indoors, the child should be kept out of doors, even at night. Trips on the water are well-recognized factors in saving life. A change from the city to country, seaside or mountain air is most salutary, provided it can be accomplished with a minimum fatigue, and for the latter reason long journeys are inadvisable.

Acute symptoms with temperature lasting over a week arouse grave suspicions of invasion and inflammation of the intestinal walls with their unfortunate sequences. Such cases pass into the class of ileo-colitis, demand special treatment by daily intestinal irrigation, and if recovery ensue, are slow in convalescing, since not the functions alone, but also the integrity of the bowel must be restored.

CHOLERA INFANTUM.

A few words should be added here concerning that really rare condition known as cholera infantum. The term has been grossly abused by application to all grades of summer diarrhea, thereby furnishing an excuse for cases lost, and enhancing the prestige of cases cured. The best clinicians of wide experience admit that they see typical cases but seldom, and it may be shrewdly suspected that modern treatment has decreased the number which present this picture.

The name should be reserved for those cases which either at the outset or suddenly in the course of a milder attack, are seized with almost uncontrollable vomiting, hyperpyrexia, with very numerous large, almost clear watery movements, and consequent marked prostration and rapid emaciation as the fluids are drained from the tissues. It very possibly differs only in being a more intense intoxication. The most hopeful treatment is that by hypodermic injection of morphin sulphate 1/100 of a grain and atropin sulphate 1/900 grain, repeated at intervals until the profuse outpouring of serum from the intestine is checked.

CONCLUSION.

It will have been noticed that the subject has been treated in this paper without reference to special types

of bacteria causing the disturbance. Thrown into confusion by conflicting reports concerning the common occurrence of the various types of so-called Shiga bacilli, our knowledge is too chaotic to serve as a basis for classification. During the same summer of 1903, when Howland and Lafetra found Shiga types in 62 out of 64 cases of all grades of summer diarrhea from all parts of New York City, similar cases of all grades and from all parts of the city were being treated in my service at the out-patient department of the Babies' Hospital, according to the principles above outlined, with gratifying success. Although bacterial studies were not made of our cases, it is inconceivable that, drawn from similar sources, they should not have shown, if examined, like findings.

Under this rational and scientific treatment, if directions are carried out, I expect recovery in all save a very few neglected or extremely marantic cases.

807 Madison Avenue.

DISCUSSION

ON PAPERS BY DRS. KNOX, HOLT, COOK AND SOUTHWORTH.

DR. J. P. CROZER GRIFFITH, Philadelphia, believes that we have not yet proved the etiologic relationship of the Shiga bacillus to the various forms of diarrhea. This in no way detracts from the importance of the investigations. They have not yet been completed nor been carried far enough to make them conclusive. Further study is to be looked for. Dr. Griffith believes, in the early withdrawal of milk in these cases, whatever the cause of the diarrhea. Some French authorities treat their cases by the administration of water only during several days, and he has no doubt that this is preferable to the use of barley, rice or egg water, but he should hesitate to resort to it, because he does not think the average parent would be willing to carry out such instructions. We must not resort to the use of opium early, nor, on the other hand, should we withhold it too long. It requires careful consideration in every case to know when to begin its use, but it is a most important and valuable drug in diarrhea.

DR. JOHN LOVETT MORSE, Boston, believes in giving an initial purgative, followed by withholding food but giving water. He has used the French water treatment for several years, and finds that the babies do better and have fewer complications if they are given as much water as they would have taken with their ordinary diet. Albumin water, barley water, etc., are but poor substitutes for milk, as regards their nutritive value. The white of one egg, for example, contains only two-thirds as many calories as one ounce of milk. The nutritive value of an ounce of albumin water, made as it usually is by mixing the white of one egg with 8 ounces of water, is, therefore, not one-tenth that of an ounce of milk. He believes that if milk is diluted to the same degree, it will usually agree with the infant as well as does albumin water. He favors the early use of milk in diarrhea, but he does not believe in withholding it so long as is often done.

DR. DAVID E. ENGLISH, Millburn, N. J., believes very strongly in the starvation treatment of diarrhea. He instructs the mothers to put an ounce of whole barley into a pint of water; this is boiled for fifteen minutes, strained through a sterile cloth and a pinch of salt added. This pleases the mother and does not harm the baby. He does not think babies are given a sufficient amount of salt.

DR. THERON W. KILMER, New York City, said that although care is usually taken as to the character of the milk or water fed to babies, it is often put into dirty and unsterilized nursing bottles. Every nursing bottle should be boiled daily for at least half an hour, and there should be as many bottles as there are feedings.

DR. R. B. GILBERT, Louisville, Ky., believes that the smallest perceptible amount of opium given in the diarrhea of infants is dangerous and injurious. If an anodyne is needed he prefers chloral hydrate. If the colon is flushed with a strong saline

solution the pain will be relieved without the use of an anodyne. He believes in the starvation, or rather the water treatment of infantile diarrhea; the use of the various diluted broths, such as barley water, amounts to little else. The water is improved, in his opinion, by aerating it.

DR. ROSA ENGELMANN, Chicago, said that physicians who work in the dispensaries and slums see other insects, such as fleas, bedbugs and cockroaches, that are not above suspicion as disseminators of disease. A possible instance of this came under observation not long ago in Chicago. In a large apartment house containing about twenty families five cases of typhoid fever were reported. The first case developed on the lower floor, and the second case on the same floor, in the apartment on the opposite side. The two families on the floor above moved away, leaving that floor vacant. In the course of a month the third case developed on the third floor, and subsequently two more cases developed on the fourth floor. The source of the infection could not be traced to the water supply (artesian), to the milk nor to the ice. It was learned, however, that this apartment house was absolutely overrun with cockroaches, contaminating the food supply. In the apartment house opposite, where there were no cockroaches, with the same water supply, no cases of typhoid fever were reported. It was unfortunate that none of the cockroaches was caught and allowed to run over a culture medium, and thus proved to be the source of the infection; since they, of all insects, are water inhabitants and consequently probable disease carriers. Investigation should be done along these lines, as has been done with fleas and bedbugs in respect to plague.

DR. WM. T. WATSON, Baltimore, said that the mothers in his practice are, most of them, very busy women, who can not afford to employ nurses. He likes to make things as easy for them as possible. He thinks that Dr. Kilmer's advice to boil nursing bottles for an hour is carrying precaution to an unnecessary extreme. Surgeons do not boil their instruments for an hour. According to Rotch, all bacteria are killed at a temperature of 154 F., and Abbott says that all pathogenic bacteria and their spores are killed by five minutes' boiling. Boiling for five minutes ought to be enough for the disinfection of bottles, which is merely surface disinfection. During the past few years Dr. Watson has been feeding an increasing number of babies on raw milk. The milk comes from the Walker-Gordon farm and is modified at home. Where the mothers are intelligent he finds no trouble to arise from feeding this milk raw. He asked Dr. Southworth if he considers this a rash practice.

DR. WILLIAM L. STOWELL, New York City, said that raw milk for infant feeding has been used at the Children's Hospital a portion of the time for the past six years. At present they are using the gravity cream from their own dairy. The milk was given raw, except in extremely hot weather, and he was surprised to see how weak children thrived on it.

DR. W. H. F. PARK, New York City, said that it has been proved that the *Bacillus dysenteriae* is the cause of infantile dysentery. He said he believed that the Shiga bacillus gives rise to typical symptoms. There are many different kinds of bacteria in the intestinal tract, and in every case of infantile diarrhea the special organism found should be clearly identified and labeled.

DR. J. H. KNOX, JR., does not think it is claimed by anyone that the *Bacillus dysenteriae* (Shiga) is the cause of every case of infantile diarrhea. The differences culturally between the so-called "acid" and "non-acid" type (to mannite) are not striking, no more so than differences known to exist between the various colon and typhoid bacilli. He said that it must be conceded that in their series the dysentery bacillus was found in the several varieties of intestinal diseases both mild and severe, called, clinically "summer diarrhea," and it is felt that it is responsible for a large number of these cases. The importance, however, of other bacteria should not be minimized. In many cases streptococci and other pathogenic organisms were present in the intestines. It may be that when there is evidence of ulceration we may often be dealing with a secondary in-

fection with streptococci superimposed on that by the dysentery bacillus.

DR. THOMAS S. SOUTHWORTH, replying to Dr. English, said he does not know how long a baby can live without milk or cream, but he does know that babies, depending on their age, have lived for weeks and months on food other than milk. In reply to Dr. Gilbert, he said that he has recommended the use of opium only for the control of excessive peristalsis in cases where the movements are more frequent than is necessary for a proper drainage of the bowel.

TREATMENT OF APHASIA BY TRAINING.*

CHARLES K. MILLS, M.D.

Professor of Neurology in the University of Pennsylvania; Neurologist to the Philadelphia Hospital.

PHILADELPHIA.

As long ago as 1880 I published an account of a case of aphasia greatly benefited by training which was largely of the patient's own initiation and conducted by himself.

The patient fell in an apoplectic attack, and was taken to one of the London hospitals, where he was seen by Dr. Sieveking and Dr. Broadbent. He was a right hemiplegic and was also totally aphasic and agraphic, but appeared not to have been word deaf, as he understood what was said to him. He had lost all ideas of numbers, but was evidently not word blind, as he understood from the first what he saw in print or in script. When he read aloud he had a marked form of paraphasia, his speech being of the jargon or gibberish type. Like many such patients, he read off this jargon as if to himself he were reading correctly. He could copy, although unable to write spontaneously. After a time he improved under rest and internal remedies. He then began, partly under direction, to try to improve his powers of speech and of writing. He was a man of considerable intelligence, of fair education and of great determination.

This man came under my observation about two years after the attack which caused his aphasia and accompanying condition, having returned to this country, and he remained under my care for several years, during which time he slowly but continuously improved until he became able to communicate both in speech and in writing without difficulty. When I examined him he could understand all that was said to him. He could answer almost any ordinary question, although he occasionally mispronounced and was at a loss for a word. It was particularly difficult for him to remember the names of individuals, although he could give a connected account of his former life. Specimens of his writing, of different dates, showed progressive improvement in writing, spelling and in the formation of sentences. He could count, repeat the multiplication table and add and subtract simple sums. He could name objects pointed out to him much better than when studied by Dr. Broadbent.¹ Instead of reading gibberish he pronounced almost every word correctly, stumbling only occasionally over a large word; each word was distinctly separated from the others, but he did not hesitate.²

In connection with this early recorded case I shall refer to a case treated by me during the past year, that of a well known physician, forty-five years old, residing in one of the Western States.

In July, 1902, he had an attack of right hemiplegia with complete aphasia, first consulting me eighteen months later. The paralysis, although still marked, was much improved. No loss of sensation and no affection of the bladder or bowels were present. The face was the seat of a moderate right-sided paresis, the tongue not deviating to either side. The deep and

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Nervous and Mental Diseases, and approved for publication by the Executive Committee: Drs. Richard Dewey, F. W. Langdon and H. T. Pershing.

1. Brain, vol. 1, January, 1879.

2. Mills, C. K., Med. Bulletin, Philadelphia, May, 1880.