rickets, its effects are very marked in the gradual solidification of the bones. I have employed it thus as a substitute for chemical food in several hundred trials, extending over a period of nearly two years.

I might have cited at length some of the typical cases benefited by this method of treatment, and have given relative weights both before and after treatment, but I prefer to await the verdict of my professional brethren giving the result of more matured and unbiased observations.

The hypophosphite of potash was not experimented on for many reasons. Dr. Thorowgood had found it far too energetic in its action to admit of my including it in a remedy intended as an agreeable dietetic for feeble children. In his paper on this subject in the *Practitioner* for July 1869, Dr. Thorowgood considered that great mischief had resulted from the incautious administration of this drug to persons affected with tubercular disease of the lung. As a gradual tonic and restorer of failing nerve-force, he prefers the hypophosphite of soda or of lime; and either of these he considers will answer the purpose better than the administration of pure phosphorus internally. Mr. Taylor (*Lancet*, November 30th, December 7th, and December 14th, 1861) says that the soda hypophosphite is best adapted for blood-disorders; those of potash, lime, and ammonia for diseases of structure and of the secretory organs; these being the most soluble of all the oxides of phosphorus, they are consequently at once admitted into the circulation. The chemical change after absorption has not yet been determined. My impression is, that the salts become deoxidised, being converted in part into phosphates and leaving a residue of phosphorus and the basic salts. There is no doubt that we have in this preparation all the therapeutic properties of phosphorus, without the danger attending the administration of crude phosphorus.

One of my colleagues, Dr. Venn, has found the soda hypophosphite efficacious in chronic bronchitis. It seems to promote free expectoration of tenacious mucus. He generally combines with it the soda carbonate, spirit of ether, and glycerine.

Dr. Thorowgood says that, in cases of serious depression and torpor, with occasional shooting neuralgic pains, and where there are numbness and deadness of the limbs arising from feeble circulation, the salts of the hypophosphites are useful. Where anæmia is present, he recommends the addition of the citrate of iron, or of the syrup of the hypophosphite of iron. The compound wine, prepared according to the formula I have suggested, has been found particularly useful in these cases of paresis and what is called "creeping paralysis".

Dr. Hayes Jackson relates how he recovered from a severe attack of neuralgia in the back and thigh of six months' duration by taking drachm doses of soda hypophosphite in beef-tea thrice daily (*vide BRITISH MEDICAL JOURNAL*, March 4th, 1865). In the remittent fevers of childhood, Dr. Purdon employed the hypophosphites with marked success. They seem to fulfil, he says, all the required indications in causing sleep, relieving thirst, cleansing the tongue, increasing the appetite, and arresting any resisting intestinal disorder, in a much shorter time than can be obtained by any other remedies (*Glasgow Medical Journal*, November 1863).

The following formula is suitable for an infant, the dose being increased according to age. R Sodæ hypophosphitis gr. vi; calcis hypophosph., potassæ hypophosph., aa gr. iv; glycerini ʒij; aquæ ʒj. Dose, forty minims thrice daily in a little water.

This mixture would have to be made up when required, as the hypophosphites deposit after a time when suspended in glycerine. The compound liquor, prepared according to my formula, is nearly five times the strength of the above, and consequently admits of a large dose being given in a small bulk. It contains a better selection of salts, and is much enhanced in value as a general tonic by reason of containing the hypo-salt of iron. It is, moreover, a stable solution; and, with the exception of a slight chalybeate flavour, may be said to be tasteless. A few drops on a lump of sugar, dissolved in the mouth, are agreeable and refreshing. It may be administered in milk or beef-tea unknown to the patient.

In tabes mesenterica, Dr. Purdon has found that the hypophosphites act slowly, but surely. He considers that they act by dissolving the tuberculous matter deposited in the folds of the mesentery and mesenteric glands, possibly by causing disintegration of the fibrine.

Dr. Thorowgood employed the hypophosphites in two cases of psoriasis with marked benefit. At the Victoria Hospital, the compound wine has been employed in similar cases as a tonic and alterative, the local disease being overcome by the use of chrysophanic acid ointment. In debility resulting from prolonged lactation, in some forms of dyspepsia, in anæmia and leucorrhœal discharges, in leucocythæmia, in myalgia, and in muscular pains simulating inflammation, Mr. Taylor has used the hypophosphites with considerable benefit.

The compound wine of the hypophosphites has proved valuable as a dietetic in repairing the waste brought about by neglect, improper food,

and other well-known conditions antagonistic to health. It has also given vigour and strength to nursing mothers, imparting the necessary elements to their milk for the production of bone and sinew; besides preventing, in many cases, that draining of the system brought about by the after-effects of epidemics, bad feeding, and ill-ventilated dwellings. A very common factor in the primary causation of diseases of young life is the prevailing ignorance of mothers in bringing up "by hand". Partly from ignorance and partly from enforced poverty, mothers will endeavour to keep their children alive on bread-sop, because unable to afford them a sufficiency of cow's milk.

The importance of carefully checking any tendency to excessive lactation will be seen at once if we but roughly calculate the still large proportion of infants brought up on breast-milk. The early months of a child's life are the most critical. All its future wellbeing depends upon careful nursing and proper nourishment. If skilful analytical examination of dairy-milk be needful, all mothers prolonging the lactation period for eighteen months or two years might with advantage be compelled to submit to qualitative analysis of their breast-milk. Indeed, at all times such analysis would prove a powerful factor in enabling the physician to trace the origin of many diseases common to young life. Is it too much to ask that some method be found of unyoking the necks of these heavily burdened mothers? As with vaccination, so with lactation, let the parents be compelled to consider the interests of their children as paramount to their own convenience. To neglect all hygienic principles is only to foster disease, which saps the foundation of young life, and darkens the pages of our national history by swelling the lists of the incurable and insane.

When I notice the daily influx into our households of mythical compounds called "food for infants", "condensed milk", etc., all obviously useless and injurious, because deprived of that oleaginous character so essential for the proper assimilation and for the growth of the young infant, I am tempted to ask, How is it that such substances are allowed to creep into the market without protest—many of them being palmed on the public under the well-known sign manual of a famous analytical chemist? Is it not enough that physicians have to combat with the conflicting and complicated symptoms produced by the immoderate use of villainous soothing syrups, teething powders, and other quack nostrums, that such must be augmented by the use of vile food-stuffs? Such *laissez faire* toleration of existing evils, because to check them would be interfering with the liberty of the subject, trajects the mind of the sanitarian to the antipodes of freedom; viz., to those realms of savagery where the halt, the infirm, the diseased, and the dying are exterminated, rather than continue a burden to the State.

For the administration of phosphorus, there is not, I am certain, a more efficient or safer medium than the hypophosphites.

Sodic hypophosphite contains 29.3 per cent. of phosphorus in an assimilable form, whereas trisodic phosphate contains only 7.9 per cent. of phosphorus in a probably inert state. Calcic hypophosphite contains 21.3 per cent. of available phosphorus. Tricalcic phosphate contains 20 per cent., of which little can be available. This in itself is sufficient evidence to warrant the conclusion as to the superior therapeutic value of the combined hypophosphites.

Messrs. Savory and Moore and Mr. Squire of London prepare and keep the wine and liquor always in stock.

THERAPEUTICAL EXPERIENCES WITH THE DIGESTIVE FERMENTS.

By F. ARNOLD LEES, L.R.C.P., M.R.C.S., F.L.S.;

WITH A REPORT OF EXPERIMENTS,

By GEORGE BROWNEN, F.C.S.*

THE ailments in which I have used the three strongest preparations of pepsine and pancreatine—viz., Savory's saline essence of pepsine and of pancreatine, and Bullock's acid glycerine of pepsinaporci—with a success never previously obtained with any others, have been so various, that it may be not unsuggestive if I enumerate some of the principal.

1. In most forms of *debility*, such as we find in convalescence from febrile and inflammatory disease, the digestive organs are weak; and here, although the power to digest a small quantity of food is not wanting, the pepsine and pancreatic essences cannot fail to hasten considerably the slow laying on of tissue by improving nutrition and securing the assimilation of a much larger quantity of food than could be taken without them. For four years or more, it has been my custom to order intermediary peptonised meals, such as a breakfast-cupful of beef-tea or chicken-broth, or mock-turtle soup, with which

* Continued from page 439.

about half an hour to an hour previously (whilst kept warm on the hob) two or three teaspoonfuls of saline essence of pepsine and one of pancreatic essence have been mixed. The soup is hardly appreciably altered in taste, and sits well upon the stomach. For the afternoon meal, milk-gruel treated with a drachm of each of the two essences, or pure milk which has undergone boiling for a minute or two, and then, after partially cooling down, has been vigorously shaken in a bottle with a drachm of each essence and drunk foaming, has been used by me with advantage.

2. In *abdominal phthisis* and other diseases associated with wasting and malassimilation of fat, whether nausea be present or not, I have for a long time found the improvised koumiss mentioned above—pancreatised and pepsinised milk, taken in occasional draughts after thorough agitation and whilst still frothy—of inestimable service. I have never recommended the addition of any alkali to the milk, but have found it best to order only so much milk to be boiled, peptonised, and agitated, as can be drunk within the hour; since, if kept longer, it acquires a sourish disagreeable taste.

3. In various forms of *vomiting from irritable stomach*, such, for example, as that which is occasionally troublesome in phthisis, I know of no remedy so seldom disappointing as Savory's saline essence, either given neat and followed in a few minutes by meat-juice or milk and soda-water, or given along with concentrated albuminous fluids, such as Southall's soluble meat or Brand's jelly-like essences, unless it be koumiss; and in two cases—later stages of phthisis—where even that was rejected when given by itself, I have found it stay down and pass on when administered with pepsine and pancreatic essence (two drachms of the former, one drachm of the latter). Why these essences should be so peculiarly grateful to an irritable stomach, I do not clearly understand; but so I have found them.

4. In *Infantile and childhood's ailments*, whether grave or trivial, especially when vomiting is severe, I have found Bullock's acid glycerine of pepsine of inestimable value. It is taken by the little patients more readily than the salty essences; and I am quite confident that I have repeatedly saved life, by preventing slow starvation, by its use alone, in the vomiting of so-called infantile remittent fever, infantile tuberculosis, tubercular meningitis, and those forms of infantile atrophy with diarrhoea dependent upon disagreement of milk-foods. In such cases, I have had unexpectedly favourable results far oftener than failures, by cutting off milk altogether for a short time, and substituting meat-juice with the peptic glycerine, and cream with a twentieth part of its weight of pancreatine mixed up with it. There need be no fear of giving too much, I think. I have found an ounce of the acid glycerine in the twenty-four hours not a whit too much; since, I take it, where there is infantile diarrhoea from malassimilation, the great point is to leave nothing, or next to nothing, for the intestinal tract to do, save absorb.

Of course, in *tabes mesenterica* and some other forms of abdominal disease, where the tubercular deposit in the absorbent glands has gone so far as to obstruct the passage of chyle by strangling the lacteal tubes, then peptic and pancreatic preparations, be they ever so active, will fail to cure; but even then the cases are very few in which for a time active digestive ferments, given plentifully with appropriate foods, will not produce appreciable amendment.

5. In the reflex *vomiting connected with pregnancy*, everything depends upon the preparation of pepsine used—such, at least, is my experience—in an especially great degree. Possibly this may be because the action of the remedy, if at all favourable, is easily appraisable: another way, perhaps, of saying that where the stomach-spasm, which leads to the rejection of food, is solely and truly reflex, and dependent upon spasm of the os and cervix uteri, then no preparation of pepsine can possibly succeed at all, since it is quite impotent to affect the source of the sympathetic irritation.

On the view, therefore, that, in the more inveterate cases of vomiting in pregnancy, something beyond the mere administration of a food-digester is necessary, I have several times with signal success tried the following methods. Where the retching is so great that the act of swallowing is difficult, or anything gulped down is almost instantly returned, I first of all give an inhalation of three to five minims of amyl nitrite (either with or without a little chloroform), and then, before the relaxing effect of this has passed, administer cold some concentrated albuminous or fibrinous food (such as Brand's essence), with two or even three spoonfuls of the saline essence of pepsine. This is very rarely rejected at once, seldom under half an hour, generally not at all. When it is not retained for any length of time, I try again; at each trial, the food will be kept down for a longer period than on the preceding occasion. Occasionally, when the patient could retain fluids for a minute or two, I have varied the above procedure by giving one drop of the amyl nitrite on a little sugar, by the mouth, followed by ten grains of chloral-hydrate, with ten minims of succus belladonnæ, in as little

iced water or soda-water as possible. This sometimes—as often as not—remains down long enough to overcome the spasm. Not unfrequently the patient expresses herself conscious of the epigastric relaxation, saying something “has given way”, or, “There! that's down now; that'll stay”; in which cases nutriment of a light nutritious character, *plus* plenty of peptic or pancreatic essence, whether it be peptonised previously or added to the milk-gruel, egg-flip, beef-tea, or other article, at the moment of taking, will nearly always be retained. Of course, the sickness will return in the course of the day or the next morning; but if, by such manœuvres, a single meal in the day can be made to pass the pylorus, it is so much clear gain.

6. In many forms of *dyspepsia*, the value of the digestive ferments is well known and unquestioned; and yet, even in cases of this large class, pepsine and pancreatine have fallen into an undeserved disuse—very many practitioners all over the country thinking little of them and very seldom using them. The price and the instability of them militate against their being kept and regularly renewed in the country practitioner's surgery. And yet, I know of no three preparations in all the *Pharmacopœia* the trial of which will so seldom disappoint, as Savory's two saline essences and Bullock's acid glycerine of pepsine. If we give them a fairly extended trial in place of the bismuth, nux vomica, and hydrocyanic acid, generally lavished on dyspeptics, the dispenser's hands would be upon the bottle containing the essences at least as often as on any other. A very little discrimination, and some rudimentary notions as to the chemistry of gaseous evolution within the body, will, in a large class of cases, decide whether digestion of starch, or fibrin, or fat is at fault—whether diastase, or pepsine, or pancreatine needs to be administered (coupled with suitable foods and muscular exercise), and the treatment of the difficult digestion resolves itself into the simplest problem, to be worked out upon the safest and plainest line: *rest* for the irritated or depauperated and overburdened glands or organ that has “struck work” one way or another, rest and relief from duty—which the steady administration of peptonised bland foods alone can give;—and in time, without local anodynes or teasing stimulants, pain will subside, ulcers heal, and functions in abeyance reassert themselves. Not that it is possible to avoid the use of drugs altogether, of course (hyposulphite of soda in a certain well-marked class of cases, for example); and yet, I suppose, there is no organ of the body for whose diseases so many drugs have been recommended, and for which so few are really necessary; and of these (*e. g.*, nux vomica), some are without doubt best introduced into the system hypodermically. I have no wish to dogmatise, however; the object of these remarks is simply to give to the trial of peptic principles and peptonised foods, on extended bases, such small stimulus as the experience of one individual can furnish.

In the various forms of dyspepsia—epigastric, duodenal, and jejunal—one fairly clear indication as to which of the digestive ferments is more particularly called for is, I have found, sufficiently seldom inquired for and profited by. I allude to the odour of the flatus, pretty sure to be passed in excess of the normal (even if much be retained) whenever decomposition of the ingesta takes place. In their decomposition, the purely starchy elements of food evolve only carbonic acid gas—the natural atmosphere (so to say) of the intestinal tract—which is well high odourless; whilst all nitrogenised elements undergoing decomposition evolve the stinking sulphuretted hydrogen. When the gas is foetid, one may be sure nitrogenous aliment has escaped chymification, either from insufficiency of the gastric ferment, or from an excess of food; and, in such cases, fair doses of the pepsine essence, with or without a little hyposulphite of soda, are almost specific. On the contrary, when there is eructation or passage *per anum* of much odourless gas, the administration of ptyalin and pancreatic essence, or good malt-extract and saline essence of pancreatine, with all meals composed mainly of farinaceous food, will prove an unailing remedy. By commercial men (whether from a habit of taking their morning meal hurriedly, or from loss of salivary secretion from smoking, I am not able always to determine) I am repeatedly told that breakfast disagrees, producing eructation of gas, heartburn, etc., much more frequently than any other meal, and in direct proportion to what they term its simplicity—a point to them so surprising as to lead to its special mention. More interesting, however, as showing the value of variety, and the power of one food to assist the digestion of another, is the assertion of their experience with which they constantly meet a recommendation to live plainly—to try oatmeal porridge with milk, for instance, in place of tea and bread and butter—viz., that if they make their breakfast include a mutton-chop, or fried eggs and bacon, it then “agrees famously”, and they are no longer troubled with indigestion of starch, even though they dispose of a considerable quantity of bread. In such cases as these, when it seems wisest, for other reasons, to disallow much meat-food, the saline pancreatic essence has again proved in my hands invaluable.

In the vomiting of dilated stomach nothing, in my experience, seems

to paralyse the vermiform movements of the epigastric muscle-fibres, and prolong the sickness by intensifying the stagnation (which of itself induces nausea) of masses of food in the stomach, more successfully than alkalies and sedatives. If, for such a line of treatment, the sharp saline essences of pepsine and pancreatine be substituted, and given in largish doses (3iii to 3vi) *neat*, if food be in the stomach; or with concentrated food small in bulk, if vomiting have relieved the stomach of all its contents to the point of producing regurgitation and upthrowing of bile-stained mucus; the retching will be rapidly quieted, and the stomach stimulated to contraction and due rotation of the food, in the most satisfactory manner.

Likewise in those forms of gastric and duodenal catarrhs, with sick headache, often styled "biliousness", the acid and saline essences of pepsine and pancreatine are markedly beneficial. The great feature of such cases is the large quantity of glairy mucus poured out by the membranes, which, since it opposes a barrier to osmosis, more especially prevents the absorption of sugar. An abnormal amount of what is formed passes into the duodenum; whereas, in healthy digestion, most of the sugar is at once taken up by the clean membrane of the cesophagus and lesser curve of the stomach. In these catarrhal states, acidulous saline essence of pancreatine is of signal service; the unaltered starch and unabsorbed sugar are prevented, apparently, from undergoing acetous fermentation, the outflow of mucus is lessened, and the passage of the contents of the stomach through the pylorus is expedited. This seems a much more rational treatment than the administration of soda with astringent bitters, since it does not delay in any degree the chymification of the gravy soups and savoury albuminous fluids, which in such cases are generally the first alimēnts to sit easily on the epigastric mucous membrane.

The report prepared for me by Mr. G. Brownen is as follows. Its merits speak for themselves, and show, as I venture to think, that the speculations in which I have indulged, as to the way in which the saline essences may act when taken into the stomach, are not altogether unwarranted, even though future and more perfect investigation should tend to establish their comparative falsity.

[To be continued.]

THE TREATMENT OF OZÆNA.

By W. PUGIN THORNTON, M.R.C.S. Eng.,
Surgeon to the St. Marylebone General Dispensary.

MUCH having been said lately on the treatment of ozæna, I herewith send notes of some consecutive cases, all of which have been treated with a nasal spray, and with a fairly successful result, judging from the time that has elapsed since they were under my treatment. Had cases III and V been able to devote more time to treatment, the result in each case would have been, I feel convinced, speaking from late experience, entirely satisfactory. The spray consists of the following:

R Sodæ carbonatis, sodæ biboratis, aa 3ij; liquoris sodæ chlorinatæ 3ss—3ii; glycerini 3j; aquam ad 3viii.

It is applied cold by means of a hand-ball spray-apparatus.

CASE I.—In the spring of 1877, a Sister of Mercy consulted me in reference to great pain about the bridge of the nose and down the left side, extending over the cheek. The left eye also had become weak. There was much throbbing in the nostrils, and a burning sensation as though a gathering were forming, but which did not take place; and the nose became so tender that a handkerchief could not be used. Whenever the Sister was fatigued, or had been exposed to cold winds, the pain in the nostrils increased to such an extent as to keep her awake through the night. Often there was bleeding from the nose, and occasionally a clear fluid without smell would pass. The skin over the bridge and sides of the nose was always of a bright red colour, which was, more noticeable when the internal discomfort was greater. She had been ordered an application to the throat, and, amongst other remedies, to sniff powdered borax up the nose. This organic condition had lasted for over two years. From March 1877 to the end of June, she was more or less under my care, and the only remedy I employed was the spray above mentioned. From that time to the present, there has been no return of the disorder, the redness of the skin has disappeared, nor has the Sister suffered from any inconvenience in her nose.

CASE II.—Miss —, aged 19, had scarlet fever in 1872. From that time she was subject to an offensive discharge, so copious that it saturated three or four handkerchiefs a day; at the same time, she suffered from deafness. This discharge was most severe during wet weather, less so during the summer months, especially if she were by the seaside, when it sometimes disappeared altogether. For two years, she

had used inhalations of camphor, benzoin, etc., alternating with nasal douches containing permanganate of potash, carbolic acid, salt, and other ingredients. During this treatment, the deafness left her; but the discharge still continued. She visited me at first daily, then every other day, from November 26th to December 20th, 1877. I saw her again eleven times during January and February of 1878. From that time till now, the discharge has ceased.

CASE III.—Mr. — was operated upon eighteen years ago for a polypus in the left nostril, a piece of bone coming away with the polypus. A tow-tent dipped in a "caustic solution" was carried in the nostril for some weeks after the operation. Two years after this treatment, Mr. — complained of much inconvenience in both nostrils, and a discharge commenced. The interior of the nose became painful, especially in that part whence the bone had been removed. "Casts" of mucus formed in the nostril, remaining about three days in damp, and a week in dry weather. The pain was great when these casts came away, keeping Mr. — awake throughout the night. A breath of air even would increase the discomfort much, so that (to use his own words) he was afraid to breathe through his nostrils. The discharge had a disagreeable smell, and blood was occasionally noticed in it. Mr. — had consulted, amongst others, M. Ricord, though he had never contracted syphilis, and had tried many remedies. I treated him daily from the 22nd of March, 1878, to the 31st with the spray alone, and again from the 4th to the 11th of April. His condition then improved, and the discharge ceased. A feeling of discomfort still remains in the upper part of the left nostril, but in a much less degree than formerly; and for this the spray is occasionally used. He finds benefit from passing the summer by the seaside, and from drawing up the salt water into his nostrils when bathing.

CASE IV.—Henry —, a sailor, aged 30, was a patient at the St. Marylebone General Dispensary in January 1878. He stated that early in the autumn of 1877 he had a severe pain over the right eye, lasting some days. This pain was followed by a discharge from the nostrils, offensive, and occasionally tinged with blood. On January 23rd, he came to the Dispensary, and was ordered to use daily a nasal douche containing permanganate of potash, and to take iodide of potassium with liquor hydrargyri perchloridi three times a day. This treatment was carried out till February 25th, when, little improvement having taken place, the spray was substituted for the douche, and he was given green iodide pills in the place of the mixture. He continued this treatment until April 3rd, when he was discharged, his nose being cured. He was told to continue taking the pills whilst at sea.

CASE V.—Mr. —, a Swedish gentleman, aged 28, suffered from ozæna since his childhood. The discharge was offensive, and sufficient to saturate two or three pocket-handkerchiefs a day. It was the same in summer as in winter, but in cold damp weather it increased. After meals, the desire to clear the nostrils was always greater than at other times. He did not remember having ever been free from treatment. From 1870 to 1872, he was twice a week, and hardly without intermission, seen by a Swedish physician, who used sprays, inhalations, and made applications to the interior of the nose with a brush, but without procuring any amelioration in his patient's condition. Mr. — came to me first on February 27th, 1877, visiting me every other day to the 6th April. He was, at the end of that time, free from the discharge, but there remained a feeling of tenderness in the nostrils. In November he returned, informing me that when the warm weather ceased he had a partial return of the discharge. After eight applications of the spray, the discharge almost ceased, and, as he could no longer remain under my immediate care, I ordered him to carry out a plan of treatment at his home. On April 2nd, 1878, Mr. — again called upon me. The discharge was slightly present, but without any smell accompanying it. After ten applications, he ceased coming, being almost cured, except that the feeling of tenderness remained to a slight extent. Some months ago, he paid me a visit; the ozænic condition being hardly appreciable.

CASE VI.—A clerk in the General Post Office, five or six years ago, caught an ordinary cold, and from that time the discharge never disappeared. The interior of his nose used to feel half closed, and was very irritable in windy weather. Passing from a hot to a cold temperature brought on an attack of sneezing, as many as twenty fits of sneezing occurring without intermission. On waking in the morning, this patient began to sneeze; and never for some years had a day passed, whether in summer or winter, without this occurring. On one occasion, during warm weather, to show how readily an attack was brought on, he was standing over a grating looking into a shop window, when a current of cold air came up through the grating, and he then immediately sneezed twenty times. After these attacks, the discharge for a short time was increased, and often became thick and of a yellow colour. Traces of blood were sometimes to be found in it; but there