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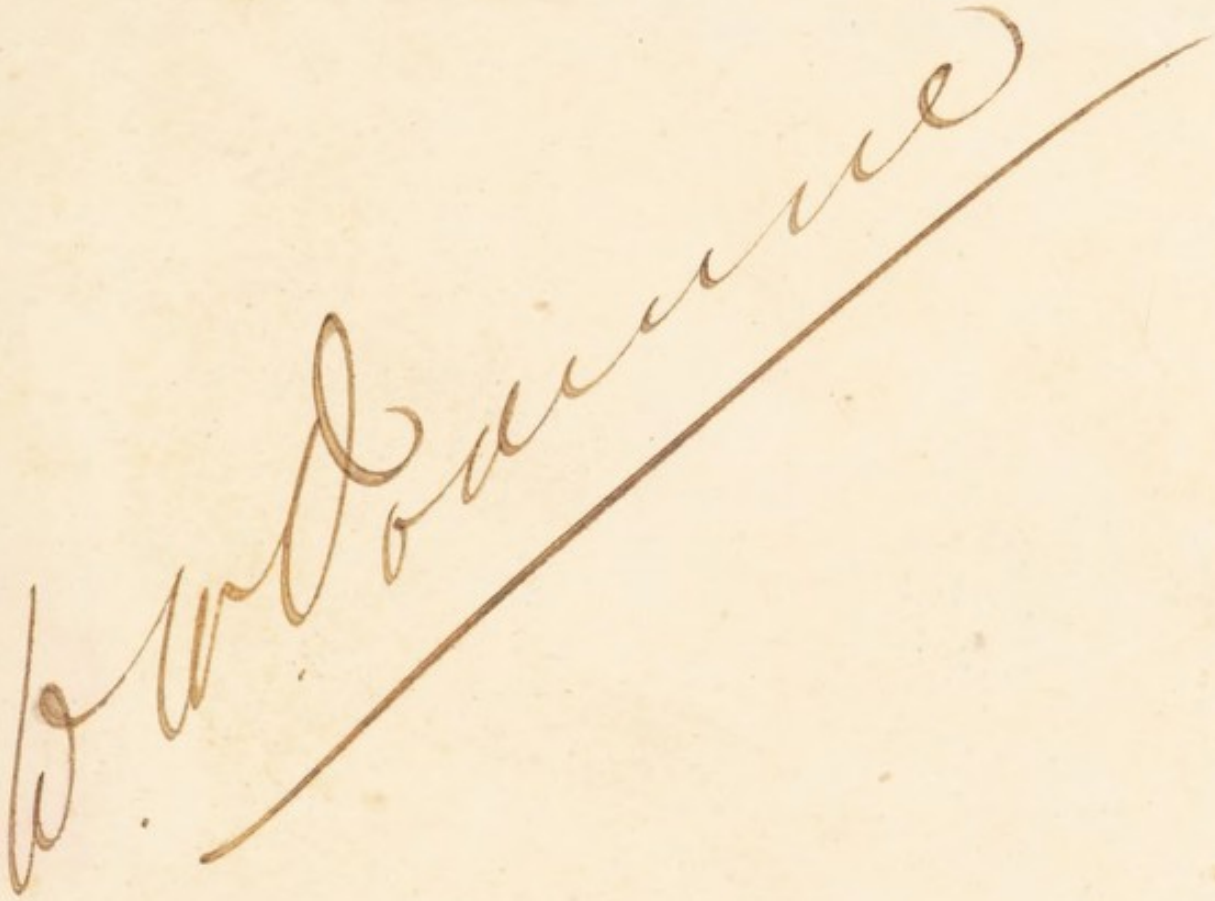
'BANTING' IN INDIA

J. DUKE



W. Woodhead

D. Cranwell
24. April 1905

BANTING IN INDIA.

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WITH

Some Remarks on Diet and things in general.

BY

SURGEON-MAJOR JOSHUA DUKE,

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Author of

QUERIES AT A MESS TABLE—RECOLLECTIONS OF THE KABUL CAMPAIGN.

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Preface to the Third Edition.

More matured experience has impressed the author of this small compilation with the importance of diet and its relations to health in India. The demand for a Third Edition shows, that some of the general public in this country are still alive to the grave and often dangerous consequences of obesity. The opponents to Bantingism are, however, many. In the summer of 1883 (when the author was in England), the lingering death of Comte de Chambord, who is said to have died indirectly as a result of reducing his enormous bulk by diet, was seized upon by the daily Papers as a good opportunity of warning the public against the adoption of a reducing diet.

The same opposition has been extended to the use of two remedies—Mercury and Bleeding; yet both are still and, probably will for ever be, of inestimable value in skilled and cautious hands. Had the late Comte de Chambord,—years before he had attained the condition which forced him to adopt extreme measures—

restricted the amount and paid attention to the quality of his food, he might even now be enjoying robust health, as the ruler or President of the French Nation.

One Prevention is far better than many Cures. If the principles contained in this pamphlet were more generally appreciated by men while young, strong, and slim, especially by those who have any hereditary tendency to corpulency, there would be fewer "Fat Paunches and lean Pates."

Our increased knowledge on this subject, especially since Professor Ebstein has shown the fallacy of the old idea that fat and butter produce fat; now render, I believe, the adoption of these diets quite harmless, while they allow of a far greater variety in the choice of food.

The present compilation* has been entirely re-written, and it is hoped that the new matter now added in the body, as well as in the appendix of the work, may render it acceptable to the general public as well as to the members of my own profession.

J. D.

SRINAGAR, KASHMIR, INDIA;
October 1st, 1884.

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* The authorities referred to are: Parkes, Pavy, Edward Smith, Letheby, Tanner, Ebstein.

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BANTING IN INDIA.

CHAPTER I.

NATURE has ordained, that, from birth to the age of seven or ten months, a child should be nursed by its mother. Our forefathers, and most Englishmen up to the end of the eighteenth or first half of the nineteenth century, were, probably, nurtured in this natural way. In the latter half of the present century, the rapid strides of civilization and forced education have altered a great deal of the former simplicity of English men and women. The school-master is abroad in every corner of the land, and the beautiful rusticity of country-life is being materially altered. Books of every kind and description, whether good or bad, can be purchased for a small sum. New religious sects are springing up every day, while atheism, and as a necessary result, immorality, have, hand in hand, made rapid strides. The steam-engine has supplanted the coach. Our steamers carry us with swiftness to every corner of the globe. Our intercourse with foreign nations and our adoption of

foreign ideas is much greater than before. Our soldiers must be set up, our army reformed, according to the ethics of a foreign nation, whose country is not equal to a twentieth part of the dominions where the British flag flies. So gentle and good have we become, under such influences, that, as many think, the result of moral cowardice, flogging is considered now unnecessary in our army and navy.

Effeminacy, unmanliness, and perhaps unwomanliness are represented by the Esthete and Estheticism.

Surely, every honest Briton must feel shamed at the following description given by Max O'Rell of certain Englishmen :—

"The female esthete wore her hair cropped, and her dress was of sombre tint, and fifteenth century design. The male esthete, on the contrary, let his locks grow long, and looked at a glimpse as if he wore a chignon. The manners of the sexes were similar; the same limpness, the same gait, the same play of features. The upper part of the face had to be raised, so as to round the eyes and make the eyebrows disappear under the hair, while the lower jaw was allowed to droop. The ideal to aim at was the expression of a gasping carp. A long sigh was drawn between each syllable; consonants were pronounced as indistinctly as possible,

and vowels were lengthened into long diphthongs. Stare as hard as you can, stick an eyeglass in your eye, put an ounce of treacle in your mouth, now look at yourself in the looking-glass, and try to speak. You will see an esthete." Effeminacy may be laughed at, but it should be looked upon as a deadly crime; for, if ancient history is written for our learning, we find in it that effeminacy is associated with those crimes which have caused the everlasting downfall of nations. The masher has followed after the esthete. One is inclined to ask oneself:

Is it possible that the Englishman has altered, or that the sturdiness and doggedness of a race has in any degree been influenced by external and foreign influences? Can the mothers of Englishmen have degenerated? It would, indeed, be terrible to think so, for, surely, England's supremacy is due, in a great degree, to the influence, training, example, and lastly, but not leastly, to the very food our own mothers have given us.

But to return to our starting point, that an infant should be fed by its own mother. Statistics have proved that nothing can adequately replace this natural food. The infant, says Dr. West, whose mother refuses to perform towards it a mother's part, or who, by acci-

dent, disease, or death, is deprived of the food that nature destined for it, too often languishes and dies. If as a result of choice or necessity, either because she will not, or cannot, the mother's part fails to be fulfilled, then the milk of another woman should be supplied. Failing this, up to a certain limit, ass' milk is the best substitute. Then comes cow's milk, which is most commonly used. It, however, requires free dilution, as much as three to four of water to one of milk, for a new born infant to commence with, gradually increasing the strength with the age. The milk of the ewe and the goat contain more solid constituents than either that of the cow or the ass.—*Vide* Appendix, Table I.

If then the infant, deprived of its natural food, thrives, as it may, provided that the milk is properly mixed, diluted, sweetened, and warmed, it should entirely continue this food up to the end of the seventh month, taking two to three pints daily. After seven months, five teeth or more having been now developed, and more saliva secreted, and up to twenty, farinaceous matters may be mixed, in gradually increasing quantities, in the milk, but they should be well cooked by first baking them, and then thoroughly dissolving them by boiling.

After this age, and up to the third year, the quantity of well cooked farinaceous matter may be still further increased and given as puddings with a little egg. Bread and butter may also be eaten ; and towards the end of the time, the child will digest well-boiled potato with a little gravy of meat. From the third to the fifth year, a little meat may also be given ; and at the end of the ninth year, it may partake of the usual food of the family ; but ALL ALONG, it should make use of a *large proportion* of milk in the various forms of bread and milk, or milk-puddings with eggs.

About the tenth year, a child will require about half as much food as a woman, and at the fourteenth year it will eat quite as much as a woman ; in fact, the proportion of food required by the child is much greater per pound weight of the body than by adults, because it has to form its tissues and build up its structures. So that, for its weight, the infant requires three times as much carbonaceous food and six times as much nitrogenous food as adult.

Such is the diet which nature and science have constructed to rear a healthy man or woman, and such, as before stated, was the course pursued by our forefathers. Within the last few years, however, artificial foods, or substitutes for mother's milk, have been

largely introduced; especially condensed milk, now made in immense quantities on the Continent, as well as in England and America. None of these preparations can, possibly, have exactly the same effect as the food provided by nature. How far the use of artificial food in infancy can affect, or perhaps has affected, the physique, or the physical qualities of a race, is a matter of grave consideration.*

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* Since writing the above, a letter has appeared in the "Lancet," of August 30, 1884, from the pen of Dr. N. E. Davies, which is so much to the point that I quote a large portion of it:—

"In my letter in the 'Lancet' of August 9th, I think I pointed out more likely reasons why artificial feeding is so disastrous to infant life, and I believe, that if those who have the care of dry-nursed children could be induced to feed them for the first few months of existence on new cow's milk, with an equal, or rather more than an equal, part of water, and sweetened with *sugar of milk instead of common sugar*,—which induces lactic fermentation, and therefore increases the tendency to infantile diarrhœa, we should not hear so much of the awful mortality of young infants. I have never found this turn curdy, or disagree where I have recommended it, because, when any complaint has been made to me of the infant rejecting it, and, before permanent mischief was done, I have advised the addition of a little lime water and a slight curtailment of the supply. We all know that cow's milk is acid in reaction, and human milk is all alkaline, and knowing this, it is always advisable to tell the nurse or mother how to correct this state of affairs. Under *any system of artificial feeding*, an infant *takes in a much larger quantity* of food than when it is suckled, but it is not digested, and *herein* lies the *cause*, combined with irregular feeding and dirty bottles, of the mischief. It must not be supposed for one moment that I advocate the cow as the proper mother

Their introduction and use is largerly taken advantage of by many lazy and indifferent mothers, and there is little doubt that fewer mothers nourish their offspring than formerly. In London and many large towns, condensed milk is often to be preferred to poor and adul-

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of an infant. I think the *present system* of rearing dry-nursed children *the curse of this generation*, and *posterity* will have to pay a *bitter price* for the indolence—if nothing worse—of the mothers of the present day, who, obeying the dictates of fashion, delegate to the nurse the duty that nature assigned to themselves. 'Can a woman forget her sucking child?' asks the prophet. Alas! the answer is not far to seek, and the infant mortality of the present day supplies a melancholy answer. . . . . Our duty as medical advisers is to teach mothers that dry-nursing is only another name for either killing their offspring, or being blessed, or rather cursed, with weakly rickety children; that develop, as they grow older, if they live long enough, tubercular disease and the other ills that follow in the train of early malnutrition. . . . . Who was that Queen of France, I wonder, of whom it is said that so careful was she that her child should be suckled by herself alone, that, when in her absence a strange nurse had done so, she was not quiet till she had made the infant vomit it up? What an example to the present race of mothers! . . . . . If there is anything in these opinions of the ancients, and the children imbibe with the mother's milk a great love for the parent, it may be an inducement in many mothers, if it were known, to suckle their own offspring; and, if feeding, as is done in the present day, and has been done for the last twenty years to many of the rising generation, on cow's milk, gives to the infant the attribute of its foster mother, we need not go very far to seek for the origin of the 'Masher,' though we may deplore the fact that so many calves have been robbed of their due quantum of nourishment to aid in bringing him to his present state of perfection."

terated cow's milk, as well as in those cases where the poor mother is herself unable to obtain sufficient nourishment to enrich her own supply. But it does not absolve the mother who can nurse her offspring, but who refuses to do so because her worldly pleasures and amusements must necessarily be curtailed.

"This condensed milk contains about one-third of its weight of sugar.* It is on this account that, as a rule, it is so liked by children; yet it is an error to suppose that a given quantity, when dissolved in water, will yield new milk, or be as useful as new milk in feeding infants, and it should never be used as a substitute in such cases whenever new milk can be obtained."

Dr. Edward Smith makes the following practical remarks on the fattening principle of this food:—"If the object were to feed an animal for the market, it would be obtained by Swiss milk. But if to make infants into strong muscular men and women, the proportion of the ingredients of the milk which nature has provided must be supplied. As a food, the addition of nearly two ounces of sugar to a pint of cow's milk greatly lessens its nutritive value, and induces a starvation of muscle-forming element. Thus, while in natural cow's milk,

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* *Vide* Table II, Appendix.

the proportion of flesh-forming to fat-forming component parts is one to twelve, in preserved milk it is not much more than one-half or about one to twenty.

Dr. Daly, in 1872, in a paper to the "Lancet," asserts, that such milk causes an undue development of fat, leads infants to refuse food of a more simple flavour, and renders them less liable to resist disease. Its general effect, he considers, is, that infants thrive remarkably, and get much fatter, as a rule, upon it than even on the breast. To look at children thus nourished are extremely healthy; but that while they apparently thrive upon it, their vitality is below par to a very dangerous degree. Dr. Daly's extended experience of eighteen months' careful watching showed that the prostration of children fed on this milk, suffering from measles, whooping cough, bronchitis, and especially diarrhœa, was out of all proportion to the severity of the disease. He has seen many children sink of slight diarrhœa in a few hours, who were being brought up on condensed milk, the children being healthy to look at, and the diarrhœa such as usually gets well. He has invariably found children thus nourished most backward in walking, no doubt due to inferior nutrition. Thus, even in infancy, we may have an unhealthy and abnormal state of obesity produced by a too great consumption of the carbo-hydrates.

These remarks should be borne in mind by anxious and observing mothers.

I must now continue our story from infancy to manhood. The human frame has been built, and therefore, to maintain health, a more limited supply of food than formerly is required to support it. Were this curtailment more generally carried out, not only would obesity be less generally observed, but dyspepsia and its sequelæ would not claim half their victims. Dr. Abernethy used to say, that no person could be persuaded to pay due attention to his digestive organs until death, or the dread of death, was staring him on the face. Those persons who read this book, do so, probably, in the hope of relieving the sufferings induced on them by ignorance and gourmandising. It is to be hoped that its perusal may be of benefit to such, but how much more efficacious might its contents be to those who have not as yet become fat, or dyspeptic, but who are going on fast in this direction. One prevention is far better than twenty cures.

Let me, first of all, point out the amount of food considered necessary to maintain health in men and women. After a vast number of experiments on diet, the minute composition of each article of food being well known, experts have drawn up tables of diet

suited to varied degrees of bodily activity with the following results :—

(Letheby.)

Daily diet required for	*Nitrogenous. Flesh-forming.*	*Carbonaceous Straches. Fats.*
Idleness	2·67	19·61
Ordinary labour	4·56	29·24
Active labour	5·81	34·97
Mean average	4·34	27·94

Or a total of 32 ounces of food in a day.

During the cotton famine in Lancashire and Cheshire, the daily amount of food barely sufficient to maintain life contained 2¾ ounces of nitrogenous and 19¼ ounces of carbonaceous matter. This is contained in 2 lbs. 4 oz. of bread. In military prisons, where short term prisoners are allowed an average diet of 24 ounces, they lose weight, and often show signs of decay. The average diet of farm labourers in the different parts of the United Kingdom is as follows :—

(Letheby).

	Dry Nitrogenous matter.	*Carbonacous, Starch, Fats, etc.*		
England ...	3·18	29·32	=	32·40
Wales ...	4·12	35·51	=	39·63
Scotland ...	4·76	36·30	=	41·06
Ireland ...	4·94	34·26	=	39·20
Mean average ...	4·25	33·85	=	34·10

Dr. Pavy, a great authority on such matters, however, considers that 42 ounces of mixed food is none too much for people engaged in physical laborious exercise.

Dr. Parkes, another great authority, allows from 42 to 46 ounces for hard laborious work. He would, however, draw no hard and fast rule. A man soon learns to know how much is good for him ; where he fails, is, on not acting up to what he knows. He considers that, as a rule, all literary and sedentary men should be spare eaters ; for though mental work requires food, it does not seem to require so much as strong muscular exertion.

Having now shown the average amount which science considers to be necessary to maintain health, let us pass on to the special dietaries : 1*st*, of Training ; 2*ndly*, to the Banting diet and other diets necessary to reduce corpulence ; 3*rdly*, diet to be adopted in old age ; 4*thly*, the diet necessary for the diabetic. In doing so, the reader will observe that all bear a close relation to each other in points of composition, quantity, and regularity.

Long before the special diet prescribed for Mr. Banting by his physician Harvey was brought to public notice, prize-fighters, jockeys, and athletes of every kind were in the habit of training by adopting a particular diet. Their food very much resembled that of

Mr. Banting, flesh and flesh-forming products largely predominating; while the starchy products and hydrocarbons were allowed only in a moderate degree, with the exception of beer.

"It may first be generally stated, that the object of training is to form muscular tissue, and at the same time to reduce the weight of the body. The object of the diet is, that muscular tissue may take the place of fat and water; while, by constant exercise, the endurance and strength of the muscular tissue be increased in quantity and quality. The skin becomes clear, smooth, fresh-coloured, and elastic. So much so, that no part of the body shows more effectually the result of training." Like everything else, training must not be overdone, for a man may so completely deprive his body of fat as to be unable to maintain prolonged exertion. In training, as in Banting, or in fact any change of life, moderation must be shown at first. The beginning and the ending of training must be gradual, lest, by a sudden retreat from a customary diet and a fixed mode of life, the seeds of disease may be sown.

"Lean meat is the chief component of the training diet, and experience has shown, that it contributes, in a higher degree than other food, to the development of strength and energy. Carnivorous animals are, for

example, not only stronger than herbivorous, but they are fiercer in their disposition, as if force were superabundant. According to Liebeg, the German physiologist, it is the rich nitrogenous diet of Englishmen which is the source of their indomitable energy ; for it is only necessary, says he, to compare the performances of German workmen, who consume bread and potatoes chiefly, with those of English and American workmen, who eat meat, in order to acquire a clear perception of the degree in which the magnitude, energy, and duration of the work done by the latter are augmented by the kind of food they live on. To this diet the same philosopher, on the same account, affirms that the English statesman at sixty is far superior to his German colleague in debate and in field sports."

"The physiological effect of training is to cause an increased absorption of oxygen by the lungs, together with a more rapid oxidation or combustion of fat. This oxidation is further increased by the diminution of the starchy products of the diet. In training, as in Banting, the amount of fluid is limited. But this limit must not be excessive, for violent exercise necessarily involves a great loss of fluid."

The following are the training diet adopted by the under-graduates of the Universities of Oxford and

Cambridge when training for rowing. They are quoted from Dr. Pavy's work on food :—

1. THE OXFORD SYSTEM :

A day's training for the Summer Races.

Rise about 7 A.M. A short walk or run.

Breakfast, 8-30 A.M., of beef or mutton underdone. Bread, the crust only recommended, or dry toast, and tea as little as possible.

Dinner, 2 P.M. Meat, much the same as at breakfast. Bread, and no vegetables (a rule, however, not always adhered to), with one pint of beer.

About 5 P.M., a row twice over the course on the river, the speed being increased with the strength of the crew.

Supper, 8-30 to 9 P.M. Cold meat and bread, with perhaps a jelly or watercresses, and one pint of beer.

Bed at 10 P.M.

A day's training for the Winter Races.

Rise about 7-30 A.M. A short walk or run.

Breakfast, 9 A.M. As at summer races.

Luncheon, 1 P.M., of bread or a sandwich, and half a pint of beer. About 2 P.M., a row twice over the course.

Dinner, 5 P.M., of meat, as for the summer races ; bread, vegetables ; rice-pudding or jelly, and half a pint of beer.

It is particularly impressed on men in training, that as little liquid as possible is to be drunk, water being strictly forbidden.

2. THE CAMBRIDGE SYSTEM:

A day's training for the Summer Races.

Rise at 7 A.M. A run of 100 or 200 yards as fast as possible.

Breakfast, 8-30 A.M. Beef and mutton underdone; dry toast; tea, two cups; or towards the end of training, a cup and a half only; and watercresses occasionally.

Dinner, 2 P.M. Beef or mutton; bread; vegetables: potatoes, greens; and one pint of beer.

Some Colleges allow baked apples, or jellies, or rice-puddings.

Dessert: oranges, biscuits, or figs, with two glasses of wine.

5-30 P.M. A row to the starting post and back.

Supper, 8-30 or 9 P.M. Cold meat; bread; vegetables: lettuce or watercresses; and one pint of beer.

Bed at 10 P.M.

A day's training for the Winter Races.

Rise at 7 A.M. Exercise as for the summer races.

Breakfast, 8-30 A.M. Ditto ditto.

Luncheon, 1 P.M. A little cold meat, bread, and

half a pint of beer; or biscuit with a glass of sherry, perhaps the yolk of an egg in the sherry.

2 P.M. A row over the course and back.

Dinner, 5 or 6 P.M. As for the summer races.

Bed at 10 P.M.

The Cambridge training diet is certainly more liberal than that adopted at Oxford, and it is less likely to cause injury to the system. Theoretically, the amount of wine allowed for the light blues is not required, the amount of alchohol contained in the quart of beer being quite sufficient.* In both diets, according to the experience of Dr. Ebstein, alluded to fully further on, butter might be allowed, while a certain quantity of fat ought to be daily consumed with material advantage.

The training is assisted by the equable and regular life adopted by the athlete, who retires early and rises early, and has to be moderate in all things.

The diet of King, the celebrated prize-fighter, consisted of:

Breakfast.—Two lean mutton chops, dry toast or stale bread, one cup of tea without sugar.

Dinner.—One pound to one pound and a half of beef

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* *Vide* Table V, Appendix.

or mutton, with toast or stale bread ; very little potato or other vegetables ; half a pint to a pint of old ale and a glass or two of sherry.

Tea.—A single cup of tea without sugar, one egg, and dry toast.

Supper.—Half a pint of oatmeal porridge, or half a pint of old ale.

Dr. Letheby remarks :—"The action of this diet is to produce only a short-lived state of effectiveness, for, carried a little beyond the appointed time, it leads to disease ; and even after such training, there is often, as in the case of Heenan the prize-fighter, terrible prostration of the system."

Such are the chief diets adopted in close training. While on this subject, it may be interesting to hear the dietary (quoted by Letheby) adopted by Dr. Fordyce, the celebrated professor of chemistry in the last century, not with the view of advising its adoption by the reader, but rather as showing an example of the wonderful accommodating power of the stomach under disadvantageous circumstances. Dr. Fordyce, by studying the habits of carnivorous animals, and reflecting on the principles of chemistry and physiology, came to the conclusion, which many will consider most illogical, that a man requires but one meal in a day ; and for

more than twenty years his daily mode of dining was as follows :—

At four o'clock in the afternoon he would present himself at "Dolly's" chophouse in London, and take his seat at the table reserved for him. Immediately on his arrival, the cook would place a pound and a half of rumpsteak upon the gridiron ; and while it was cooking, the doctor would amuse himself with some such trifle, as half a boiled capon, or a plate of fish, and a glass or two of brandy ; his regular allowance being a quarter of a pint. Then came the steak, with a full accompaniment of bread and potato, and it was always served with a tankard of ale. This was followed by a bottle of old port ; and when dinner was finished, as it invariably was, in an hour and a half, he walked leisurely to his rooms in Essex street, where he delivered his lecture on chemistry.

Whether this lecture was always lucidly expounded we are not informed, nor is the age given when this unique professor died, most probably from gout.

With regard to the training diet, composed so largely of nitrogenous food, it should be carefully borne in mind, that health is maintained only so long as free exercise is taken. "This exercise is necessary for the absorption of the greater amount of oxygen required

to help nature to throw off and eliminate the extra amount of special food. Without free exercise, the system, instead of improving, becomes clogged with injurious products, leading to the development of gout and gouty deposits in the different joints, together with an increase of solid matters in the wince and the deposit of sand and gravel."

The subject of fixed diet gives me the opportunity of quoting Dr. Letheby's remarks on the effects of prison-diets in England, Scotland, and Ireland. He says, so much do those diets vary in extent, that they furnish an inducement for the commission of crime in certain districts rather than others, owing to the richness of the rations. In all cases the dietaries of prisons are so greatly in excess of the union, that in times of distress, they often offer encouragement to misdemeanour in order that the prison-diet may be reached in preference to the workhouse. Whereas the daily ration of the workhouse contains only 17 ounces of dry nutritious matter, that of the convict equals 22 ounces.

These remarks apply in a degree to India, where prisoners who have been discharged constantly commit small crimes simply to obtain re-admission into an institution where they are well fed, well housed, and well clothed. With the exception of solitary confinement,

to the ignorant masses of India, prison-life is made hardly objectionable enough. It is more than probable, that were the majority of small jails done away with, and short-term prisoners entirely employed in gangs on the public works of India, its railways, roads, and canals, that crime would be more successfully opposed, and that the State would be the gainer.

CHAPTER II.

Let us now pass towards the subject of obesity, commencing with a few remarks by Dr. Parkes on age and weight :

"At the age of 22 or 23, the body is almost as heavy as is natural to it, the average of young Englishman being from 9 to 12 stone, though many persons become a little heavier up to thirty years of age.

"After thirty, a perfectly healthy man will change little in weight up to sixty. If in middle life he becomes fat, it shows one of three things : either he is eating or drinking too much, or he is less active in body and mind, or that some of his organs, especially his lungs, are beginning to act less perfectly. This everyone must have observed in the anæmic form of obesity.

"A perfectly healthy man will, in the course of a year,

often vary in weight from two to four pounds; this is nothing, and is compensated for by corresponding changes afterwards. A man who weighs 10½ to 11 stone at twenty-three, and increases 10 to 12lbs. by the time he is thirty, will often weigh 13 to 14 stone by the time he is forty or forty-five."

Dr. Parkes does not consider this increase in weight a profoundly serious matter; that it depends upon fat being stored away, chiefly in the loose parts, where it most easily finds room, leaving the great vital organs untouched. The height of such an individual is, however, not given; whereas Mr. Banting found this increase fatal to his existence. *Vide* Table IV, *Appendix.*

"This increase shows that the outgoings and ingoings of the body are not in equilibrium; and that the constructive and destructive processes do not balance. The health is really not perfect, and sometimes the fat is deposited on organs, and, it may be in organs, the liver, or the heart, leading first to imperfect function, and then to graver changes. Besides, the mere accumulation of fat is sure to lessen bodily activity, and the change in the body caused by such activity." Dr. Parkes, in conclusion, advises every one to try and keep their weight fairly constant, and to lessen food, or increase work, if the body is getting heavier.

Let me now pass on to the obese man whose obesity is associated with serious symptoms and derangements. These derangements depend partly on the injury to some vital organ, especially the heart and liver ; partly on the complications of other grave constitutional ailments.

Dr. Ebstein shows that anæmia is always present in high degrees of obesity, and that gout and diabetes are the unpleasant, yet frequent, associates of corpulency. Hippocrates has already shown, and the popular voice still awards but a short life to the corpulent, who are, in truth, threatened with dangers on all sides. Dr. Ebstein considers them less capable of resisting the baneful influences around them, and when attacked by acute infectious diseases, that they rally less easily than those well nourished and equipped with a normal supply of fat. The earlier in life corpulency becomes highly developed, the fewer are the prospects of a prolonged existence ; for once it gains a footing, the disease usually proceeds apace. The disease depends, to a certain extent, upon a weakness which lacks the strength to bear the privations imposed upon it by its constitution. If this lack of resolution to forego the so-called attractions of life exists, then the prognosis of a prolonged life cannot be held out.

The disease obesity may be partial, or more or less

complete. It may be chiefly confined to the omentum, causing enormous enlargement and the condition called Potbelly. The omentum has been known to weigh as much as thirty pounds. In complete obesity, fat is accumulated under the skin, especially the abdominal wall, causing the increase of those inches which are so annoying to the measurer. This is the first fat that disappears under diet. Fat is also deposited between the muscles, upon the heart, beneath the pericardium or bag holding the heart, in the mesentery and omentum, around the kidneys, under the breasts, as well as the nates. Beyond a certain point, the abnormal pressure of this fat impairs, to a greater or less extent, the action of the important organs it envelopes. The omental fat, potbelly, impedes the action of the diaphragm, the chief muscle used in breathing ; while any large quantity over the heart may materially impede its action. Both are exemplified by difficulty of breathing and palpitation of the heart. Experience shows that enormously fat people do not attain to old age. Daniel Lambert, who at one time weighed 52 stone, died suddenly in his 40th year Bright, an excise grocer, whose waistcoat was said to be big enough to enclose seven ordinary slim men, died at 29. Palmer, the Brompton landlord, who only weighed 25 stone, died at an early age. He came to London to see

the huge Lambert, and the envy excited by his witnessing the greater size of his fellow countryman, is said to have hastened his death. Many people think that corpulency diminishes mental, as well as bodily, activity. Shakespeare has it :

> " Fat paunches have lean pates, and dainty bits
> Make rich the ribs, but bankrupt quite the wits."

To sum up then: There are necessarily disturbances in the organs of respiration, circulation, and digestion ; the virile power is diminished, the blood is deficient in red corpuscles, and the resulting anæmia seems to rapidly increase the disease. By this decrease of red corpuscles, the number of oxygen conveyors is diminished, thereby rendering oxidation defective and deficient.

All the results and miseries of obesity are practically and graphically described by one great sufferer, Mr. Banting.

Few men had a more active life, mentally and bodily. Hereditary influence had nothing to do with his complaint. At the age of thirty, Mr. Banting began to grow fat. In spite of violent exercise, walking, riding, rowing, and the administration of lowering medicines, his weight increased. At the age of sixty he was 14 st. 6 lbs. Compared to his height, which was only 5 feet 3 inches, this weight was excessive. Making allowance for age, his

proper weight should have been from 10 to 11 stone. In other words, he was three stone too heavy.

Let Mr. Banting go on with his resulting sufferings. On account of his size, he could not stoop to tie his shoes, nor attend to the affairs humanity requires, without considerable pain, and suffering. His breathing became difficult after any exertion, and he suffered from pain in his knee and ankle joints. When coming downstairs he was obliged to go backwards. His sight began to fail, and he began to grow deaf. In fact, his excessive fat made life a daily burden. His deafness now led him to consult Dr. Harvey, who attributed his symptoms to fat; and ordered him to adopt the diet which will be referred to further on. In his individual case, humanly speaking, not only did the adoption of this diet save his life, but it enabled him to live happy and contented. Many sufferers like himself have also been equally benefited, though many apparently have injured themselves by adopting it too suddenly, rashly, and without taking heed to the depressing symptoms that have arisen. Although a third edition of this compilation is called for, I have only met one officer who had apparently derived the same benefit that Mr. Banting did. We happened to be passengers by a homeward mail steamer, and sat next

each other at dinner. Colonel W—— was then a man of considerable presence. He told me that, having by diet reduced himself more than a stone in weight, he could hardly now realize the amount of suffering he had, for years, gone through on account of the size of his waist and neck. The recent and scientific researches of Professor Ebstein have shown some faults in this apparently otherwise useful diet.

After the adoption of his diet for one year, let Mr. Banting now reduced 46 lbs. in weight, 3 st. 6 lbs., and we presume once more an active slim looking man, again speak for himself:

1. I have not felt better in health than now for the last twenty-six years.

2. Have suffered no inconvenience whatever in the probational remedy or since.

3. Am reduced 13 inches in bulk, and 50 lbs. in weight.

4. Can perform every necessary office for myself.

5. My umbilical rupture is cured.

6. My sight and hearing are surprising at my age.

7. My other bodily ailments have become mere matter of history.

At seventy-two years of age, Mr. Banting had little to complain of. His muscular vigor increased, his appetite

was good, and he slept well. His symptoms of acidity, heartburn, and occasional faintness were all cured.

It is now time to review the means necessary to remove obesity.

Dr. Ebstein observes : "The restriction of the quantity of food is absolutely the first postulate for any one wishing to get rid of superfluous fat superinduced by too plentiful nourishment. But to return from an excessive to a duly proportioned diet is not a restrictive case, as ordinarily understood. From the above statement it follows, that this limitation should not apply merely to one or other article of food, but that all must be properly adjusted one to the other. How far the limitation should be carried on is a question depending too intimately on the actual *individual* circumstances, to allow of any law to be laid down. How to hit off the happy medium is the all-important element in securing longevity."

Since the publication of Ebstein's views, the popular theory that fat produces fat has been upset; and as this subject appears to be a matter of considerable importance, it will be gone into somewhat freely.

Dr. Ebstein maintains that—

1*st*. The corpulent may daily take a suitable quantity of fat without thereby growing fatter.

2nd. Fat, combined with the albuminous,—*i.e.*, nitrogenous,—materials, and the carbo-hydrates, each in due proportion, is able to co-operate effectually to operate against obesity.

3rd. As the result of numerous experiments in the treatment of corpulency, fat agrees perfectly well, even with those who had previously regarded it with nausea. When taking it, his patients preserve a good appetite, which they have to learn to moderate by yielding only to the actual feeling of hunger. The alleviation of hunger in a diet with a proper allowance of fat is due to the fact, that fat checks the decomposition of albumen; and that, consequently, the craving to make good the waste makes itself felt more slowly and less urgently. Precisely because fewer albumates have been decomposed, fewer require to be replaced.

As, also, by the addition of fat to the diet, in the same proportion as the decomposition of albumen is diminished, the quantity of nitrogenous refuse from the assimilated substances is also limited, so a smaller amount of drink is needed for its removal. Hence, in this way, thirst, as well as hunger, becomes appeased.

Other observers bear out these observations on the functions of fat. After its consumption in hot climates

"Loew" noticed always a diminished demand for water. Thirst became decidedly less irksome. "Lehmann" considers fat to be one of the most active agents in the metamorphosis of animal matter, by its solution of nitrogenous articles of food during digestion, and also by converting nutrient plastic substances into cells and masses of fibre.

Elsasser, in carrying on artificial digestion, found that fat considerably accelerated the digestion of nitrogenous food. Lehmann's later experiments have shown that albuminous,—*i.e.*, nitrogenous,—substances, deprived of fat, remain longer in the stomach, and take longer todigest than the same substances impregnated by fat. It is also generally considered that the digestive power of pancreatic juice is due to the presence of fat; while there is good reason for believing, that it is largely concerned in the formation of bile, and that the biliary acids are congregated fatty compounds. This may account for the well known action of fat bacon and other such foods, in promoting the secretion of bile.

The digestive power of fat is certainly considerable, and it is no less active in the subsequent conversion of nitrogenous matter into cells and tissues, and perhaps also in effecting this retrograde decay. Its action on

the blood, again, is most important. Colourless blood corpuscles receive, perhaps, the first impulse of their formation from the metamorphosis of fat; and thus it may be an important aid in the genesis of blood. Dr. Letheby sums up his remarks as follows :—" The conclusion, therefore, is, that fat takes an active part in the process by which the nutrient constituents of food are converted into the solid substrata of organs; and so energetic are its powers in this respect, that when the nitrogenous matters of the fluids are not in sufficient quantity to form cells with the fat, it borrows the material from muscular and other tissues, and thus produces (or leaves) a fatty degeneration of the part." This is observed in the muscular structures of overfed animals, in the tissues of drunkards who take a large amount of fat-forming food, in the livers of geese that are crammed with a farinaceous diet, and perhaps I may add in the livers of overfed and underworked Europeans in the Georgeous East. Fat must, therefore, enter largely into the composition of our food, for other hydro-carbons, though capable of transformation into fat, cannot entirely take its place.

Compared with the carbo-hydrates the preponderating energy and use of fat is shewn in the table (overleaf) copied from Letheby.

Colorific and motive powers of 10 *grains of the substance in its natural state:—*

		Pounds of water raised 1° *F.*	*Pounds lifted one foot high.*
Grape Sugar	...	8·42	6,500
Lump Sugar	...	8·61	6,647
Arrowroot	...	10·06	7,766
Butter	...	18·60	14,421
Beef Fat	...	20·91	16,142

This table proves that the colorific power of fat is twice as great as that of starch or sugar.

Dr. Ebstein holds that the property of fat to diminish both thirst and hunger facilitates, in an extraordinary degree, the introduction of a modified diet; while it permits always in moderation of the use of salmon, paté de foie gras, and such like delicacies, thereby helping to reconcile the reformed gourmet to his other sacrifices.

These somewhat lengthy remarks, on what may be called a greasy subject, are necessary considering that this substance has been hitherto wrongly excluded from the Banting diet, and therefore equally as wrongly from the dietaries of all athletes.

Having shown that meat, as well as fat, must be partaken of by the corpulent man, let me now state what he must avoid. These substances resemble fat in that it contains no nitrogen. They are called the carbohydrates, and comprise the starches and sugars.

In the stomach the carbo-hydrates, after becoming changed into glucose by digestion, take the form of various acid compounds, as lactic acid, which occurs in the stomach and in the juice of flesh ; butyric, formic, and acetic acids, which are found in the perspiration. Dr. Letheby shows that the presence of lactic acid in the stomach is essential to the digestion of nitrogenous matters.

The experiments of all leading Physiologists have proved beyond question that fat may be derived from the carbo-hydrates, though, according to Dr. Pavy, to produce this result there must be a due accompaniment of other alimentary substances. It would not be suitable in this book to give all the experiments in animals that have shown, beyond all doubt, the action of the starches and sugar in producing fat. The most simple instance is that of paté de foie gras, or the enlarged liver of the goose. This bird is shut up in a narrow wooden coop and stuffed, morning and evening, with maize or Indian corn. In a month's time the result required is obtained. The bird is almost suffocated by its own fat. Its liver weighs from one to two pounds ; while, on being roasted, three to five pounds of fat are said to escape from it. Experiments on animals and other birds have shown the same result.

100 parts of Indian meal contain 11·1 of nitrogen 64·7 of starch, 8·1 of fat, and water 14.

In England, fowls are said to be fattened completely in a fortnight by cramming them in a dark place with a paste made of barley meal, mutton suet, and some treacle or coarse sugar, mixed with milk. Here there is a perfect combination of the carbo-hydrates, assisted by a certain amount of fat.

One of the results of Dr. Pavy's experiments shows that the ingestion of sugar and starch produces an augmentation of the size of the liver due to an increase of the amyloid substance contained in it. This is a fact worthy of careful observation by Civil Surgeons in large stations in India, who are weekly, and often daily, called to make *post mortem* examinations on cases of sudden death by murder or suicide, in people whose diet is chiefly composed of the carbo-hydrates. In these cases, the liver is very frequently found enlarged, and amyloid in people otherwise with healthy organs. This is perhaps a bold statement to make, but such is the general result of my own observation; and until my attention had been more particularly drawn to it in connection with this subject, I could give no explanation of it.

To continue. *The grand principle of the Banting diet, then, really lies in the avoidance of those articles of food*

which contain a large proportion of either sugar or starch; or failing this to partake only of them in such quantity as is absolutely necessary for health.

These articles of food are embodied in the following table:

Nutritive values of food. Letheby :—

				Carbo-Hydrates.		
		Water.	*Nitrogen.*	*Starch.*	*Sugar.*	*Fat.*
Bread	...	37	8·1	47·4	3·6	1·6
Wheat Flour	...	15	10·8	66·3	4·2	2
Barley Meal	...	15	6·3	69·4	4·9	2·4
Oat Meal	...	15	12·6	58·4	5·4	5·6
Rye Meal	...	15	8·	69·5	3·7	2·
Indian Meal	...	14	11·1	64·7	·4	8·1
Rice	...	13	6·3	79·1	·4	·7
Peas*	...	15	23·0	55·4	2·	2·1
Arrowroot	...	18	——	82·	——	——
Potatoes	...	75	2·1	18·8	3·2	·2
Carrots*	...	83	1·3	8·4	6·1	·2
Parsnips*	...	82	1·1	9·6	5·8	·5
Turnips*	...	91	1·2	5·1	2·1	——
Sugar	...	5	——	——	95·	——
Treacle	...	23	——	——	77·0	——
New Milk	...	86	4·1	——	5·2	3·9
Cream	...	66	2·7	——	2·8	26·7
Skim Milk	...	88	4·0	——	5·4	1·8
Butter Milk	...	88	4·1	——	6·4	·7
Beer and Porter	...	91	·1	——	8·7	——

Out of the different articles of this table, a few may be eliminated for partial use, separately, or in small quantities together.

Thus, while peas contain a large amount of starch they contain a proportionately large amount of nitro-

gen. It is this composition that makes the class they belong to *very nutritious.* New milk contains nearly as much nitrogen as sugar, and the small quantity necessary to flavour the cup of tea allowed in the diets might at all events be tried and watched.

If it holds true that relative fattening powers of food depends only upon the amount of starch and sugar contained in them, then the following articles of food may be consumed in the Banting diet, of course in moderation.

Nutritive values of food. Letheby :—

Articles of food allowed to the Corpulent.

	Water.	*Nitrogen.*	*Fat.*	*Starch.*	*Sugar.*
Cheddar Cheese...	36	28·4	31·1	——	——
Skim Cheese ...	44	44·8	6·3		
Lean Beef ...	72	19·3	3·6		
Fat Beef ...	51	14·8	29·8		
Lean Mutton ...	72	18·3	4·9		
Fat Mutton ...	53	12·4	31·1		
Veal ...	63	16·5	15·8		
Fat Pork ...	39	9·8	48·9		
Green Bacon ...	24	7·1	56·8		
Dried Bacon ...	15	8·8	73·3		
Ox Liver ...	74	18·9	4·1		
Tripe ...	68	13·2	16·4		
Poultry ...	74	21·	3·8		
White Fish ...	78	18·1	2·9		
Eels ...	75	19·9	13·8		
Salmon ...	77	16·1	5·5		
Entire Egg ...	74	14·	10·5		
White of Egg ...	78	20·4	——		
Yolk of Egg ...	52	16·	30·7		
Butter and Fats ..	15	——	83·		

In these two tables lie the key to the dietary of the corpulent. If he is not satisfied, let him refer to the dietary for the diabetic, which is framed so as to secure, as far as possible, an exclusion of starchy and saccharine principles of food. This latter diet gives a greater variety than can be obtained from these tables. Practically speaking, this pamphlet might end here and the patient be allowed to choose his own diet.

Perhaps, however, most readers will agree with Professor Ebstein "that it is not only desirable, but absolutely necessary, to give our patients as precise directions as possible on the quality and quantity of their food. In the former respect it is be observed that it seems very beneficial to restrict them at first to a definite number of ailments. The treatment is, therefore, kept more under control, and it becomes easier to avoid the mistakes liable to be committed respecting the quantity to be taken of the several articles of diet. Now (let the reader carefully recollect) that this quantity is not the *same for all.* That it varies not only with the bodily stature and weight, but also with the various pursuits and powers of endurance on each individual. A more rigorous course may be adopted with the corpulent who are young, than with 'feeble folk' needing every indulgence. We can do no more than lay down

the general principles (as I hope has been done) and give a few special rules. But neither this nor any other method of treatment should or can be reduced to a stereotyped system. In our medical practice we all of us operate with the same means, some with good, and some with bad, results."

The foods then to be avoided are, broadly speaking :

1. Sugar in any form. Mr. Banting, in experimenting on himself, found sugar the most active of all fat-forming foods. He repeatedly observed that five ounces of sugar, distributed over seven days, augmented his weight by nearly one pound at the end of this time.

2. Potatoes.

3. Beer.

4. Milk, except in moderation.

5. Bread, except in small quantity. (Ebstein limits the amount to 3½ ozs. a day.)

6. Rice.

The following is the diet recommended by Profr. Ebstein:—

Breakfast.—In summer, 6 to 6-30 ; winter, 7-30 A.M. One large cup of black tea without milk and sugar. Two ounces of white or brown bread, toasted with plenty of butter.

Dinner.—2 to 2-30 P.M. Soup, often with marrow, 4 to 6½ ounces of roast or boiled meat, vegetables in

moderation, leguminous,—*i.e.* peas, broad beans, etc., preferentially, but also cabbages. Turnips occasionally. After dinner, a little fresh fruit. For second course, a salad, or occasionally stewed fruit with sugar.

Beverage.—Two or three glasses of light white wine immediately after dinner; a large cup of black tea, without sugar or milk.

Supper.—7-30 to 8 P.M. An egg, or a little roast meat or both, or some ham with its fat. Bologna sausage, smoked or fresh fish, about one ounce of white bread well buttered: occasionally, a small quantity of cheese and some fresh fruit.

Beverage.—One large cup of black tea, without milk and sugar.

Under this diet no dyspeptic disorders ever occurred, the appetite was always unexceptionable, while dinner was looked forward to with a decided feeling of hunger. In the evening, the craving for food was slight, and soon satisfied.

The habit of life was, on the whole, very quiet, and uniformly active, with moderate bodily exercise, and varied with regularly long walks.

Dr. Ebstein's patient, who adopted the diet, was forty-four years old, and had, until his twenty-fifth year, been lean and thin. In nine months his girth was reduced

six inches, and his weight proportionately slowly and steadily. His bodily and mental faculties considerably increased, and his general health greatly improved.

This diet also yielded the best results in a lady who, towards her thirtieth year, suffered from corpulence, combined with a high degree of anæmia, debility, and extremely rare and defective menstruation. Iron had quite failed to remove the anæmia. After adopting this diet for six months, her figure was reduced four inches, the anæmia disappeared, and the menstruation became quite regular.

Dr. Ebstein's experience proves that his diet has proved beneficial, especially as preventative in complicated cases of *corpulency and gout*, and when the symptoms point at the participation of the *heart* in the affection. In severe cases of diabetes, he has introduced his diet with the best results in clinical practice. And he agrees on the whole with Cantanini, who counsels an exclusive flesh and fat diet for diabetes. Dr. Ebstein considers that the corpulent may be described as on the high road to diabetes.

The following is *The Banting diet* :—

Breakfast, 9 *a.m.*—Five ounces of beef, mutton, kidneys, boiled fish, or cold meat (except pork) ; one ounce

of dry toast, or a little biscuit. One cup of tea without milk or sugar.

= 6 oz. solid, 10 oz. liquid } food.

Dinner, 2 p.m.—Six ounces of any fish except salmon ; any meat except pork ; any vegetable except potato, parsnip, beetroot, turnip, carrot.

One ounce of dry toast ; fruit out of a pudding.

The six ounces of meat might include any kind of poultry or game.

Beverage.—Two to three glasses of Claret, Sherry or Madeira.

= 10 to 12 oz. solid, 10 oz. liquid } food.

Tea.—Two to three ounces of cooked food ; a rusk or two ; one cup of tea without milk or sugar.

= 2 to 4 oz. solid, 10 oz. of liquid } food.

Supper, 9 p.m.—Four ounces of meat or fish, with a glass or two of Claret or Sherry and water.

Total amount in 24 hours.

Solid	... 26 ozs.
Liquid	... 35 ozs.

On rising in the morning, in order to correct acidity, Mr. Banting took daily the following medicine :—

Magnes. Carbonatis	... ℥i
Sp. Ammon. Co.	... ℥ii
Tinct. Cardam. Co.	... ℥ii
Water	... ℥iii

Dose.—One tablespoonful in water.

Dr. Tanner attaches much importance to this medicine as helping to ward off the uric acid, diathesis, and gout. The experience of Mr. Harvey, who prescribed this diet for Mr. Banting, was, that no indication of gout followed his treatment.

The reader will observe from the perusal of the former pages that the total restriction of the fats and butter is the weak point of this diet, and that their exclusion may, probably, account for the inanition and debility produced in some cases, which may be said to hold good more in those whose constitutions have been weakened by a long residence in India, or who are adopting this diet under the terrible and enervating heat of an Indian climate.

Such people should more particularly carry out general principles, and stick to no stereotyped rules, their guiding star being then varying weight and bulk, and above all their OWN FEELINGS, for no safe conclusion can be drawn from the improvement in weight and volume alone.

The following diet I would recommend the corpulent in India to give a fair trial to :—

Chota Hazaree. (Early breakfast.)

A small slice of buttered toast or hard biscuit.

A cup of tea or coffee, *without sugar*, and milk.

A slice of lemon in the tea is a good substitute for flavouring.

When commencing the diet, I would allow a little milk with the tea; and theoretically cream in moderation is always admissible. Cocoa, made from ribs, may also theoretically be taken. In 100 parts there are 36 of cocoa butter, only ·55 of starch, no sugar; a trial might be made.

For those who have to get through much physical exercise before breakfast, Chota Hazaree is one of the most important meals in India. I would advise, in addition, either one or two raw eggs or half-boiled or poached. The yolk of the raw egg is very quickly and easily digested, and when dusted over with a little pepper and salt, and a little vinegar or Worcester sauce, may be mistaken in the dark for an oyster.

Fresh fruit of course may be taken.

Breakfast, 9 or 10 *a. m.* Five ounces of any kind of meat, with the fat attached to it, or fish; fresh vegetables, of course avoiding potatoes and those forbidden; all grown above ground are allowable.

A tablespoonful of well cooked dhal, or vegetables of this class.

A slice of buttered toast, or hard biscuit, or the trial of only *one* slice of bread and butter at the com-

mencement. One cup of tea or coffee, with a trial of cream.

A glass or two of claret or the wines in the diabetic table.

Lunch, 2 p. m.—This should be the dinner, and the dinner treated as a light supper.

Five ounces of any kind of meat, game, or fish, or ham; vegetables as for breakfast; salad; tomato salad; stewed fruit.

One ounce of white bread, buttered.

Wines as at breakfast, or tea or coffee, a moderate quantity, half a pint of Burton Bitter Ale may be tried.

Dinner.—As early as possible, called supper.

Soup, a small quantity of meat or fish and vegetables. One ounce of buttered bread, toast, or hard biscuit.

Claret, a light wine, or perhaps a peg.

Cheese in small quantity may be tried daily.

I see no harm in one or even two eggs* for breakfast, and one for supper, if this diet is found debilitating.

The principle is, that the yolk of the egg, though it

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* In my own case I found my waist reduced, by drinking only water at dinner and avoiding sugar and potatoes. Otherwise, my diet was of the usual kind, including plenty of butter with toast and also eggs. This diet suited the individual in a bracing climate.

holds a large proportion of fat and a smaller proportion of nitrogen, contains no starch or sugar.

During the hot season, in the plains, probably twice as much fluid will be required as in the cold. This extra amount is rapidly carried off by the skin.

Such is the broad outline of a diet which I think may safely be adopted in India. It should be recollected that it is only an outline. Some people will find it too much, some too little. My chief fear is, that it will be found too liberal, and may fail in accomplishing its object. The principles are given, the patient must carry out his own line of practice so long as it is consistent with health and the reduction of his disease, bearing in mind that his decrease in weight and bulk must be gradual. Obesity is a disease that cannot be cured in a week or in a month. It is a question of months or a year—while it has, probably, been endured for years. The loss of half a pound a week is perfectly safe, provided that it be continuous, the extreme limit should, I think, be from three quarter to a pound, provided that there be no symptoms of debility or depression of spirits. The patience and determination of the patient will be severely taxed. But the result of the battle may mean return of vigor, bodily and mental activity, and prolongation of life and relief from suffering.

Before closing this subject I would add one more instance of reduction diet, which Dr. Parkes quotes in in his Manual of Health.

At the age of forty-four, Thomas Wood, an Essex miller, had become enormously stout from intemperance in beer and excessive eating. He then completely altered his diet, and adopted the following for nearly eighteen years :—

One pound of flour was made into a pudding with three pints of milk and two eggs. When boiled, this pudding weighed three pounds, of which he took half for breakfast and half at dinner, and no other food. He also took violent exercise. He is said to have partaken of no *fluid* except that in the pudding, which seems incredible. He would never allow himself to be weighed, but he is believed to have lost 10 stone in weight. His health became perfect, and he had no gravel, which before had much troubled him. A few days before his death he had ridden sixty miles on horseback without any sense of fatigue. He, however, died at sixty-four from inflammation arising from exposure to cold.

His diet was not deficient in quantity, for it equalled nearly 21 ounces of water-free food, or about 40 ounces of ordinary food ; so that he was really eating nearly as much as his neighbours. For a daily cost of 11*d.* he

obtained his food, doing very hard work and enjoying perfect health.

The obese sufferer has now many diets placed before him. If the Ebstein, or Modified Banting, or the Diabetic diet suit him individually, let him continue to adopt it. But whichever plan he choose for himself, let him remember, at the same time, the importance of the general principles laid down in these pages. Let his own feelings, consistent with his loss in weight and bulk, decide what is best suited to his particular case.

If more latitude were given, if the corpulent would make more use of their common sense, sticking too rigidly neither to this or that, there would be fewer opponents to these dietary systems, and many thousands of pounds which are annually spent on drugs to relieve the distressing symptoms due solely to corpulency would be saved.

By way of assisting the obese sufferer, who is commencing the Banting diet, I would recommend the trial of a comparatively new drug 'Cuca.'* It is obtained from Peru, and is chewed by the Indians when going on long and exhausting journeys. The corpulent like the Indian has a long journey before him. The effects of

* For further information about this drug, *vide* Appendix.

Cuca are said to be the relief of pain, fatigue, hunger, and thirst, and its habitual use is said to conduce to mental clearness, activity, and sleep.

There are two chief preparations of this drug. The Fluid Extract, the dose of which is one to four teaspoonful several times daily; and the Vinum Cuca, wine of Cuca, the dose of which is from one to eight teaspoonfuls.

This remedy might be tried not only in obesity, but also in diabetes and many exhausting diseases. I would recommend it also to Mahomedans as a preventative of thirst during the Fast of Ramzan.

CHAPTER III.

The third heading is the diet of old age.

"Old age may be said to commence at sixty. Healthy old age is a gradual process; it begins with a slow lessening of the various internal changes in the body; the senses and the several organs gradually get feebler; the lungs are less permeable; their air-cells enlarge, and the breathing power slowly lessens; the heart is less strong, and beats slower; the stomach is less capable of digestion, and the liver and eliminating

organs are not so effective. The only part which may not suffer is the mind, for, curiously enough, when properly used, this often remains active when the rest of the body is decrepid."*

Gradually as these changes occur, the man feels he is getting old ; he eats less ; gets thinner, which is natural and healthy ; and when age has fairly advanced upon him, his very height lessens, and he becomes shorter than in youth.

The old man has neither the appetite nor the power of digestion of his manhood, and the attempt to make him eat largely in order to keep up his strength is a dangerous plan. The dictates of appetite should, however, not be neglected. If an old man has a good appetite, and can digest well, and is in good health, he may continue to eat as his appetite counsels. But, as a rule,

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* "A rule may be laid down that a man should keep at his business, whatever that may be, as the best means of preserving his mind in good activity, until he receives a decided notice from either mind or body that a change is necessary. No doubt, a man is not always a good judge of his own condition. Every one has heard the story of the Professor who at sixty wanted to retire from teaching, as he thought his powers were failing, but his friends thought otherwise, and persuaded him to continue. When he reached seventy years, the position was reversed ; his friends wanted him to retire, but now, unfortunately for himself, he saw no failure, and desired to remain." There is a moral in this story which holds true to more than one statesman of the present century.

the healthiest old people are the sparest eaters. It is, in fact, certain that some of the evils of old age are owing to more food and liquid passing in than the excreting organs can get rid of. Hence arise indigestion, bowel troubles, gouty affections, some skin diseases, and general discomfort of feeling,—all of which can be removed at once by lessening the diet.

The instance of Cornaro, the Venetian gentleman of the 17th century, who, after a wild turbulent youth, which destroyed his health, restored himself after the age of forty to perfect health by a most rigid diet. His food, regularly weighed and measured for sixty years, equalled 12 ounces of solid food and 14 ounces of wine. This diet consisted of bread, meat, yolk of egg and wine. He lived till he was nearly 100 years old, and enjoyed excellent health.

The facts and hints given in this and following diets should be remembered. They at least show the extent to which some old men have reduced their food with great and remarkable *individual* benefit. They, of course, must be taken, *cum grano*, on the ancient principle that "what is sauce to the goose is not sauce to the gander."

For instance, the translator of Cornaro's books into Latin, the Jesuit Lepsins, who followed his rule, laboured

under many disorders, and lived only to seventy-nine. The advocates of matrimony may say that it was because he was not married, *for married men have a longer life than unmarried on the average.*

The diet of "John Wesley," the celebrated preacher, is another instance of individuality of diet. After reading Dr. Cheyne's work on health, Mr. Wesley became a spare eater, and (although not a member of the blue-ribbon army) drank nothing but water. His constant travelling in order to preach the gospel also added to his health, and though weakly in youth, he travelled, when he was seventy-three years of age, about 4,000 miles every year, which, in his day of bad roads and horse travelling, was good, and felt himself better able to preach than at twenty-three. At eighty-two, he tells us he felt as fit for exercise of mind and body as he had been forty years before. He died at eighty-eight, retaining his health until within a few days of his death.

Sir John Sinclair, in his Code of Health, says, a respectable Magistrate, who at the age of seventy-three was free from every bodily complaint, informed the author that he had never paid five shillings a year to the faculty in the course of his life, which he attributed to his having restricted himself to fourteen ounces a day of solid food.

The case of old Parr may also be cited as an instance of long life, not with very small, but very simple, diet. He was supposed to be 152 years old, and was brought up to London to see Charles the Ist, where he died. Harvey, the great discoverer of the circulation, says that Parr's diet consisted of ordinary sub-rancid cheese and milk in every form, coarse and hard bread, and small drink, generally sour whey. This somewhat unpleasant diet is not likely to be followed by many, but it suited the individual.

Dr. Parkes, who quotes all these instances, does not, however, commend any old man of seventy to weigh out twelve ounces of solid food every day; but, on the contrary, to consult his appetite and digestion. These two latter should decide the amount of food which seems best to secure individual perfect health.

If he suffers from gout, gravel, or indigestion, he should lessen the amount of food, and make it chiefly farinaceous and milky. All food must be well cooked and made as digestible as possible. A very limited supply of meat is advisable for old age; while some old men seem better without it, or is it that the real second childhood is commencing? Rice is one of the best of vegetable food for an old man. Its starch grains are very digestible, and it supplies nitrogen in moderate

amount, well fitted to the worn and slowly repaired tissues of the aged. Rice, milk, bread, and fruits, fresh and dry, are appropriate foods for the very old. Cod-liver oil in small doses, one to two teaspoonfuls daily, is an excellent remedy for the very old. If there is any tendency to gravel, meat should be given up altogether.

An old man's meal should be not too far apart, but he should take little each time. It is better to limit the amount of liquid drink, on account of the action of the skin and kidneys being lessened. But if there is a wish for it, this limitation must be cautiously carried out. These few remarks on the diet for advancing years are from the pen of one of the wisest men in our profession, who has himself passed over to the great majority.

The following is Dr. Pavy's diet for the *Diabetic*, which, as before mentioned, is framed with a view of excluding, as far as possible, the starchy and saccharine articles of food. It is practically a Banting diet if the theories of the causation of obesity are correct. It also gives, what seems to be especially necessary to relieve the irksomness of the cure, plenty of latitude to the patient, and does not tie him down to hard and fast rules.

DIETARY FOR THE DIABETIC AND FOR THE CORPULENT.

May Eat.

Butcher's meat of all kinds, except liver.

Ham, Bacon, or other smoked, salted, dried, or cured meats.

Poultry. Game.

Shell-fish and fish of all kinds—fresh, salted, or cured.

Animal soup, not thickened ; beef tea and broths.

The almond, bran, or gluten substitute for ordinary bread.

Eggs, dressed in any way.

Cheese Cream cheese.

Butter Cream.

Greens. Spinach. Turnip tops. Turnips.

French beans. Brussels sprouts.

Cauliflower, Broccoli, Cabbage.

Asparagus, Seakale, Vegetable Marrow, Mushrooms.

Watercress, Mustard and Cress, Cucumber Lettuce.

Endive. Radishes. Celery.

Vinegar. Oil. Pickles.

Jelly, flavoured, but not sweetened.

Savoury Jelly.

Blanc-mange made with cream, but not milk.

Custard made without sugar.

Nuts of any description, except chesnuts. Olives.

May drink.

Tea. Coffee. Cocoa from nibs.

Dry Sherry, Claret, Dry Sauterne, Burgundy, Chablis. Hock Brandy, and Spirits that have not been sweetened, Soda-Water.

Burton Bitter, Ale in moderate quantity.

Let the corpulent who is very fond of beer, when commencing the diet, keep to one glass of beer at dinner, and try its effect.*

Must avoid eating.

Sugar in any form.

Wheaten bread and ordinary biscuits of all kinds.

Rice, Arrowroot, Sago, Tapioca, Macaroni. Vermicelli.

Potatoes, Carrots, Parsnip, Beetroot,

Peas, Spanish Onions.

Pastry and Puddings of all kinds

Fruits of all kinds, fresh or preserved.

I think that peas and Spanish onions might be taken in moderation, and fruit is allowed by both Dr. Ebstein and Mr. Harvey.

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* I know of one officer who reduced himself a stone in weight by adopting the Banting diet, while he at the same time drank daily one bottle of beer. He was taking strong exercise at the time. This again suited the individual.

Must avoid drinking.

Milk, except sparingly.

Sweet Ales,—mild and old.

Porter, Stout, Cider; all sweet wines, sparkling wines, Port wine, unless sparingly; Liqueurs.*

I here insert a diet that, with an eye to future events, might possibly be of use. During the early part of the siege of Paris, the French Government, anxious about the food-supply, consulted the leading physicians of the metropolis in so important a subject, and Dr. Sée was instructed to lecture on it at the School of Medicine.

He said the *daily* diet of an adult might be made up as follows:

1,543	grains of beef.
308	grains of salt fish.
11,574	grains of bread.
771	grains of bacon.
771	grains of vegetables.

This contains 3·14 ounces of dry nitrogenous matter and 18½ ounces of carbonaceous matter. These proportions, Dr. Letheby remarks, are barely sufficient to maintain life.

One of the cheapest foods, which maintains at the same time robust health, is found in oatmeal. In some

* Dr. Pavy's gluten biscuits and bread are procurable in London at Mr. Bletchley's, 362 Oxford Street; Mr. Van Abbots, 5 Princes Street, Cavendish Square; and Mr. Bonthrons, 106 Regent Street.

parts of Scotland, the farm labourers, who work very hard and are fine strong men, still live on oatmeal and milk; and a ploughman's allowance is daily 2½ lbs. of oatmeal and one pint of milk. Taking the daily cost of oatmeal at 3*d.* per pound, and of milk at 2*d.* a pint, the daily cost would be only 9½*d.* In one of Dr. Parkes's experiment on diet, he kept a soldier, thirty years of age, and weighing 10½ stone, and doing hard work, on oatmeal and milk alone; and found that he was kept in perfect health and at a constant weight by 1¾ lbs of oatmeal and two pints of milk. The cost was 5*d.* for the oatmeal and 4*d.* for the milk, *viz.*, 9*d.* a day, or 5*s.* 3*d.* a week. The man himself was very sorry to return to his soldier's rations of bread, butter, meat, and potatoes. "One and a quarter pounds of oatmeal will supply as much nitrogen and almost as much fat to the body as one pound of uncooked meat of ordinary quality; and while the meat (in England) costs 10*d.* per pound, the oatmeal costs only 3*d.* or 4*d.* For the same money, therefore, a man will get nearly three times as much nourishment in oatmeal as in meat, and the oatmeal is more cheaply cooked."

Dried peas and beans have nutritive value, as far as nitrogen is concerned, much superior to meat, while their cost is only one-sixth or one-seventh. They are, how-

ever, deficient in fat; and, therefore, require to be eaten with butter, lard, oil, or bacon, which assists in their digestion. Maize, or Indian corn, appears to be almost the cheapest article of food. One pound and a half of maize equals one pound of uncooked meat in nitrogen, and surpasses it in fat; and this quantity can be purchased for *2d.* These remarks are quoted to show the nourishing value of food other than meat, when this cannot be procured. They might, with advantage, be borne in mind by those who are engaged in storing food in our fortresses for Europeans.

CHAPTER IV.

The Banting diet for Musalmans, and the Banting diet for Hindoos, yet remain to be described.

The ordinary diet of Musalmans may be divided into three classes.

I.—Nawb's or Raise's.

1. Meat, minced meat, eggs, and meat with vegetables cooked together.
2. Ghi (clarified butter).
3. Pulao (rice and meat cooked together).
4. Zarda (rice, ghi, and sugar cooked together).
5. Chapati (wheaten flour).
6. Milk, daily; fruits of every sorts.

II.—Middle Class.

1. Chapati.
2. Meat or minced meat, once a day.
3. Dal, or vegetables, once a day.
4. Fruits, occasionally.
5. Meat and vegetables cooked together.
6. Milk, generally every day.
7. Ghi, in moderate quantity.

III.—Poor.

1. Chapati (wheat or bajra).
2. Vegetables and dal, every day.
3. Meat, occasionally.
4. Buttermilk.

Articles now to be especially avoided.

1. Zarda, sugar, sweetmeats.
2. Rice.
3. Milk.
4. Chapatis, only in moderation.
5. Potatoes.

Before adopting a strict plan, let trial be first made of lessening the food, taking *one-third* of the quantity before eaten, without altering the character of the food. Failing this, adopt a diet on this plan.

Morning Meal.

One chapati made of chunna (gram) and 'jau,' (barley), about two chhataks ; or attah, if the first is not digested ; or one slice of buttered toast or hard biscuit.

One egg.

Fresh fruit.

A cup of water, or tea, or coffee without sugar. The tea can be flavoured with a slice of lemon or a small quantity of cream.

Midday Meal.

Fish, two chhataks.

Goat, sheep, beef, fowl or game, with the fat, two chhataks, cooked with a small quantity of ghi.

If meat *alone* is eaten, as much as four chhataks, with the fat, or ghi, can be taken.

Dal, one chhatak to one and half.

One chapati about two chhataks, or toast or hard biscuit.

Vegetables.

Condiments, salt, pepper.

Half a seer or more of water, tea, or coffee.

Evening Meal.

One chapati.

Fish or meat, two chhataks.

Dal half to one chhatak.

Vegetables.

Buttered toast may be substituted for the chapati or hard biscuits. Cheese may be partaken if in moderation.

If spirits are drunk, one chhatak may be added to a pint of water for a meal, but their use is not recommended.

In the hot weather, probably half as much again fluid or twice as much will be required as in the cold weather. But small quantities of fluids are opposed to fat. The light wines allowed in the previous diets may, of course, be taken.

The cordial alkaline draught, before quoted, may be taken once or twice a day, provided that it does not induce diarrhœa.

Ordinary diet of Hindoos, Brahmins.

Chapatis.

Dal and vegetables (excepting onions and a few others).

Rice—"Khirni" (rice boiled in milk).

"Halwa" (flour, ghi, or sugar cooked together).

Fruits.

Ghi.

The flesh of the sheep and goat is eaten by some Hindoos, notably the Sikhs and Goorkhas. But very

few eat it daily. Once a week or fortnight by the middle class. Government servants partake of it more freely. Fish is eaten by a fewer number.

The more expensive articles are rarely eaten by the poor.

Articles of food to be especially avoided.

1. Khirni.
2. Halwa ; sugar and sweetmeats of all sorts.
3. Milk.
4. Rice.

Let the Hindoo, like the Mahomedan, first try simply lessening his food by one-third or one-half. There is little doubt that the rich in both classes indulge somewhat too freely at the table to their own cost. Bunniahs, who are generally rich men, as a rule have large paunches.

It is exceedingly difficult to form a diet from which flesh and fish must be excluded.

In this edition I have not given one.

The amount of food should be limited to from 13 to 16 chhataks a day.

Ghi must be taken with the food in moderation. Dhal must be partaken of somewhat freely.

The cordial draught should be taken once or twice a day.

Of course tea and coffee may be taken, if permitted.

Coffee is made as follows :—

1*st.*—Roast it, during which process the seed swells considerably.

2*nd.*—Grind it very fine.

3*rd.*—Pour one quart of water on one and a quarter chhatáks (½ oz.) of the ground coffee.

Stir the mixture for three or four minutes, cover up closely, and let it stand for a quarter of an hour. Pour off clear and warm for use.

Coffee should not be boiled, as by so doing the aroma is in part dissolved. In order to get its full benefit, after the clear portion has been poured off, boil the grounds (the residue) in water, and then this hot decoction, after being strained, should be added to the fresh coffee to increase the aroma.

Dr. Letheby considers coffee a valuable food. During exercise, its use is found to diminish the demand for food; in fact, with a maximum of work to perform and a minimum of food to accomplish it, he will best sustain his vital power who resorts now and then to a cup of tea or coffee.

It is well to recollect that coffee is supposed to increase the action of the bowels more than tea.

Having at last concluded these brief remarks on diet,

and having reduced on paper the paunches of my corpulent readers, let me be allowed to close this compilation with a discourse on the Therapeutical drinking of hot water, which I have copied from the "Lancet" of September 15th, 1883.

Hot water is a remedy within the reach of us all ; but its value as a medicine (beyond an ordinary emetic) is probably known or realized by few.

"The practice dates back to 1858, when Dr. James H. Salisbury, of this city, concluded a series of experiments on feeding animals to ascertain the relations of food as a cause and cure of disease. Besides swine, he experimented on men. These he took in companies of six healthy labourers, placed under military discipline, which he enforced himself. He also ate and drank as they did. The men were kept on single articles of food, coffee, and water. Among these articles were beans, beef, bread, chicken, crackers, fish, lobster, mutton, potatoes, rice, turkey, oatmeal. The blood, urine, and fæces of the animals were carefully examined microscopically and chemically, daily, without any preconceived idea to develop, but simply to ascertain facts and develop ideas from those facts. In this manner he went through the whole range of food to show the permanent value when lived on exclusively and singly. Among other things, he found that the fermentations of food, and the products of these fermentations, were the chief primary factors in producing the diseases which arise from unhealthy alimentation. With the idea of removing these diseases by removing their causes, he employed hot water in order to wash out the saccharic, acetic, butyric, hydrosulphuric, and lactic acids, and sulphide-of-ammonium fermentation-vegetations (yeasts), from the stomach and intestines. At first he tried cold water on his men to remove these products of fermentation, but the cold water caused distress, pain, and colic, so he increased the temperature of the water. Lukewarm water made them sick at the stomach, and excited peristalsis upward. The temperature of

the water was increased to hot—110° to 150°. This was well borne, and afforded a feeling of agreeable relief, which thousands since testify to. The hot water excites normal downward peristalsis of the alimentary canal, washes down the slime, yeast, and bile through its normal channels, washes out the liver and kidneys, and the bile is eliminated through the bowels, and not through the blood, *via* the kidneys. It was some time before the proper times of administration, and proper number of ounces of hot water, and the proper number of ounces to be drunk at meals could be settled in order to obtain the best results. These directions may be found published in connexion with the Salisbury plans for the treatment of consumption, Bright's disease, diabetes, fibroids, sclerosis, and colloid diseases. At the risk of repetition, and for the sake of a more thorough understanding of the subject, these details will be plainly and simply given.

1. *Directions for using Hot Water according to the Salisbury Plans.*—The water must be hot, not cold or lukewarm. By hot water is meant a temperature of 110° to 150° F., such as is commonly liked in the use of tea and coffee. This is to excite downward peristalsis of the alimentary canal. Cold water depresses, as it requires animal heat to bring it up to the temperature of the economy, and there is also a loss of nerve force in this proceeding. Lukewarm water excites upward peristalsis or vomiting, as is well known. In cases of diarrhœa, the hotter the better. In cases of hæmorrhages, the temperature should be at a blood heat. Ice water is disallowed in all cases, sick or well.

2. *Quantity of Hot Water at a Draught.*—Dr. Salisbury first began with one half pint of hot water, but he found it was not enough to wash out, nor to bear another test founded on the physiological fact that the urine of a healthy babe sucking at the breasts of a healthy mother, the best standard of health, stands at a specific gravity varying from 1015 to 1020. The urine of the patient should be made to conform to this standard, and the daily use of the urinometer tells whether the patient drinks enough or too much hot water. For example, if the specific gravity of the urine stands at 1030, more hot water should be drunk, unless there is a loss by sweating. On the other hand, should the specific gravity fall to 1010, less hot water should be drunk. The quantity of hot water varies usually from half to one pint,

or one pint and a half at one drinking. The urine to be tested should be the *urina sanguinis*, or that voided just after rising from bed in the morning, before any meals or drinks are taken. The quantity of urine voided in twenty-four hours should measure from forty-eight to sixty-four ounces. The amount will, of course, vary somewhat with the temperature of the atmosphere, exercise, sweating, &c., but the hot water must be given so as to keep the specific gravity to the infant's standard—to wit, 1015—1020. The urinometer will detect at once whether the proper amount of hot water has been drunk, no matter whether the patient is present or absent. Another test is that of odour. The urine should be devoid of the rank urinous smell so well known but indescribable. It should be like the babe's urine, free from odour and deposit on cooling, and the colour like that of champagne. The Salisbury plans aim for this in all cases, and when the patients are true and faithful the aim is realised.

3. *Times of taking Hot Water.*—One hour to two hours before each meal, and half an hour before retiring to bed. At first Dr. Salisbury tried the time of half an hour before meals, but this was apt to be followed by vomiting. One hour to two hours allows the hot water time enough to get out of the stomach before the food enters or sleep comes, and thus avoids vomiting. Four times a day gives an amount of hot water sufficient to bring the urine to the right specific gravity, quantity, colour, odour, and freedom from deposit on cooling. If the patient leaves out one dose of hot water during an astronomical day, the omission will show in the increased specific gravity, as indicated by the urinometer, in the colour, &c. Should the patient be thirsty between meals, hot-water can be taken any time between two hours after a meal and one hour before the next meal. This is to avoid diluting the food in the stomach with water.

4. *Mode of taking the Hot Water.*—In drinking the hot water it should be sipped, and not drunk so fast as to distend the stomach and make it feel uncomfortable. From fifteen to thirty minutes may be consumed during the drinking of the hot water.

5. *Length of time to continue the use of Hot Water.*—A period of six months is generally required to wash out the liver and intestines thoroughly. As it promotes health, the procedure can be practised by people in health

throughout life, and the benefits of cleanliness inside be enjoyed. The drag and friction on human existence from the effects of fermentation, foulness, and indigestible food, when removed, give life a wonderful elasticity and buoyancy, like that of the babe above alluded to.

6. *Additions to Hot Water.*—In case it is desired to make it palatable and medicate the hot water, aromatic spirits of ammonia, clover blossoms, ginger, lemon juice, sage, salt, or sulphate of magnesia are sometimes added. Where there are intense thirst and dryness, a pinch of chloride of calcium or nitrate of potash may be added to allay the thirst and leave a moistened film over the parched and dry mucous membrance surfaces. Where there is diarrhœa, cinnamon, ginger, and pepper may be boiled in the hot water, and the quantity lessened. For constipation, a teaspoonful of sulphate of magnesia, or half a teaspoonful of taraxacum, may be used in the hot water.

7. *Amount of Liquid to be drunk at a meal.*—Not more than eight ounces.* This is in order not to unduly dilute the gastric juice or wash it out prematurely, and thus interfere with the digestive processes.

8. *The Effects of Drinking of Hot Water as indicated are* :—The improved feelings of the patient. The fæces become black with bile washed down its normal channel. This blackness of fæces lasts for more than six months, but the intolerable fetid odour of ordinary fæces is abated, and the smell approximates the odour of the fæces of healthy infants sucking at healthy breasts ; and this shows that the ordinary nuisance of fetid fæces is due to a want of a proper washing out and cleansing of the alimentary canal from its fermenting contents. The urine is as clear as champagne, free from deposit on cooling or odour, 1015 to 1020 specific gravity like an infant's urine. The sweat starts freely after drinking, giving a true bath from the centre of the body to the periphery. The skin becomes healthy in feel and appearance. The digestion is correspondingly improved, and with this improvement comes a better working of the machine. All thirst and dry mucous membrane disappear in a few days, and a moist condition of the mucous membrance and skin takes place. Ice water in

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* Equals 14 tablespoonfuls.

hot weather is not craved ; and those who have drunk ice-water freely are cured of the propensity. Inebriety has a deadly foe in this use of hot water.

9. *Summary of General Considerations on the Therapeutical Drinking of Hot Water.* — (*a*) Foundation for all treatment of chronic diseases. (*b*) Excites downwards peristalsis. (*c*) Relieves spasm or colic of the bowels by applying the relaxing influence of heat inside the alimentary canal, just as heat applied outside the abdomen relieves. (*d*) Dilutes the ropy secretions of the whole body, and renders them less adhesive, sticky, and tenacious. (*e*) Inside bath. (*f*) Dissolves the abnormal crystalline substances that may be in the blood and urine. (*g*) Necessary to have the hot water out of the stomach before meals. (*h*) Its use is to wash down the bile, slime, yeast, and waste, and have the stomach fresh and clean for eating. (*i*) Promotes elimination everywhere. (*j*) If objection is made, it must be remembered that we are 73 per cent. water. (*k*) The gas that some times eructates after drinking hot water is not formed by the hot water, but was present before, and the contractions of peristalsis eject it, or sometimes it is the air that is swallowed in sipping, as horses suck air. The amount of gas contained in the alimentary canal is larger than most are aware of, and yet it is not excessive as it takes some time to eruct a gallon of gas from the stomach. This time can be tested by submerging a gallon jug filled with air under water and observing how long it will be in filling with water. (*l*) Some physicians have advised against hot water, on the ground that it would burn the covering off the stomach. If this is so, then a denudation of the lining of the stomach for twenty-five years is compatible with a state of otherwise perfect health with no sign of illness for that period of time, and is also compatible with the numerous cures that have occurred under the use of hot water as a foundation during the past twenty-five years. Again, the same physicians drink tea and coffee at the same temperaturcs, and this act belies their warning and shows their inconsistence and want of consideration before speaking. (*m*) These dicta about the therapeutical drinking of hot water were founded on physiological experiments at the outset, verified in pathology and based on the experience derived from the treatment of thousands of cases since 1858."

In my own practice I have found water drunk as hot as it can possibly be borne, a cure for sea-sickness, when other remedies have completely failed.

And now, kind reader, farewell. If any of my remarks in the first chapter of this pamphlet seem strong, they appear to me justified by existing circumstances ; and, they are, after all, but the utterances of one Englishman who is loyal to his fellow-countrymen, and whose only object is to aid in maintaining the vigour, hardihood, and manliness of the British nation.

Appendix.

TABLE I.

Composition of Milk of different Animals.

(MM. Henri and Chevalier.)

	Ass'.	Woman's.	Cow's.	Goat's.	Ewe's.	Mare's.
Caseine ...	1·82	1·52	4·48	4·02	4·50	1·62
Butter ...	1·11	3·55	3·13	3·32	4·20	·20
Sugar of Milk ...	6·08	6·50	4·77	5·28	5·00	8·75
Various Salts ...	·34	·45	·60	·58	·68	
Total Solids ...	9·35	12·02	12·98	13·20	14·38	

It must be remembered that the analysis of different observers vary considerally; that of Payen, quoted in Dr. Pavy's book on Food, and of Vernois and Beequerel, quoted by Dr. E. Smith, all differing very much.

According to this table ass' milk most nearly resembles mother's milk,—especially in caseine or curd, an excess of which is the cause of half the complaints of young infants.

Dr. Edward Smith says, that equal parts of cow's and ass' milk approach closely in composition to human milk.

The addition of one tablespoonful of cream to three-quarters or a pint of ass' milk would, probably, make up the deficiency in butter. The great advantage of

ass' milk is that it may, after a few days, be given neat.

Cow's milk, on the contrary, contains much more curd and caseine than human milk. It, therefore, requries dilution according to the strength of the milk. This varies so in different cows, and under different conditions of food and climate, that it is, I think, unwise to lay down hard and fast rules for dilution. Some people consider one-third of water sufficient ; some, equal parts ; some, two of water to one of milk. I believe that at one of the great lying-in hospitals in London, the milk of newly born infants is diluted as much as four or five of water to one of milk, and the strength gradually increased.

Dr. Edward Smith recommends two-thirds of cow's milk and one-third of warm water, with half an ounce of sugar of milk to each pint. In practice it is usual to add a tablespoonful of lime water to each half pint, or often equal parts of water and lime water. The importance of sugar of milk is referred to in a foot-note in the first chapter. If sugar of milk be not obtainable, it may be substituted by somewhat more than half the quantity of refined cane-sugar.

The following preparation, taken from the *Lancet*, August 23rd, 1884, seems a good substitute for mother's milk, and it is certainly a remedy to fall back on. It is a

prescription recommended by Dr. Frankland. Its action is to remove one-third of the caseine or indigestible part of cow's milk, by diluting it with whey instead of water, making up for the deficiency of butter (as compared with mother's milk) by the addition of cream, and its deficiency in sugar by the addition of same :—

1. Allow one pint of milk to stand for about 12 hours.
2. Remove the cream.
3. Add the cream thus obtained to another separate pint of fresh milk.
4. Now add to the first pint of skim milk one inch of rennet. In India, where rennet is often difficult or impossible to obtain, the solution or preparation equivalent to rennet should always be kept in the house. Whey at other times being a most important help in a sick-room, for it is often retained on the stomach when all else is rejected. A tablespoonful of vinegar added to a quart of milk just at the boil, will act very well.
5. Set the vessel containing the skim milk and rennet into hot water until the milk is fully curdled. I would say, put the milk on the fire, and just when it begins to bubble and simmer, put in the rennet, stir round for a minute, and remove from the fire, and let the vessel stand until it is curdled.
6. Remove the rennet for further use.

7. Separate the whey.

8. Boil it up (to separate remaining curds) and strain.

9. Now add to it about two teaspoonfuls of white refined cane-sugar.

10. Mix this whey with the pint of milk to which the cream has been added.

The above quantity is generally sufficient for a new born infant for twenty four hours, and except in the hottest weather will keep sweet for this period.

In India, in the plains, it would probably have to be made three times in the twenty-four.

Warm barley water is often added to milk in proper proportion, with very good effect in some children, instead of ordinary water.

TABLE II.

Showing the Composition of Condensed Milk. [Pavy.]

	Anglo-Swiss.	Aylesbury.	Cross and Blackwell.
Caseine ...	18·52	17·20	16·30
Fatty matter ...	10·80	11·30	9·50
Sugar of milk ...	16·50	12·00	17·54
Cane-sugar ...	27·11	29·59	27·06
Ash ...	2·12	2·24	2·39
Phosphoric acid ...	·64	·67	·70
Water ...	24·30	27·00	26·50
	100	100	100

The free addition of barley water to Swiss milk in place of water is to be recommended ; and also in some cases a small addition of Liebeg's food to this mixture, with a view of increasing the percentage of fat and nitrogen in particular.

TABLE III. [Pavy.]

Composition of—		Cream.	Skimmed Milk.	Buttermilk.
Nitrogenous matter	...	2·7	4·	4·1
Fatty matter	...	26·7	1·8	·7
Lactine (sugar of milk)	...	2·8	5·4	6·4
Saline matter	...	1·8	·8	·8
Water	...	66·0	88·	88·
		100	100	100

Buttermilk is much more nourishing than whey, one pint of buttermilk containing 490 grains of carbon and 55 of nitrogen. Whereas one pint of whey contains only carbon 193, nitrogen 14·5.

TABLE IV.

Showing the normal weight of the body stripped in proportion to height of a man, up to the age of thirty. After the thirtieth year there is generally an increase in the weight, which may be consistent

with health, but it should not be more than seven per cent.:

Height.		*Average Weight.*		
Ft.	in.	st.	lbs.	lbs.
5	1	9	2	128
5	2	9	9	135
5	3	10	2	142
5	4	10	9	149
5	5	10	12	152
5	6	11	1	155
5	7	11	4	158
5	8	11	12	166
5	9	12	5	173
5	10	12	13	181
5	11	13	4	186
6	0	13	8	190

Beyond this weight the respiration becomes diminished.

Seven per cent. added to a man's weight, who is 6 feet high, will make him 14 st. 8 lbs., or 204 lbs.

TABLE V.

"If any one tries and find that he is better in health for a little alchohol, let him take it, but he should keep within the boundary line, *viz.*, that 1½ ounces of pure or absolute alchohol in twenty-four hours form the limit of moderation. He will then not do himself any harm."

It should be only taken with meals, in order that it

may not act too strongly on the stomach, and be not too rapidly absorbed. And though it cannot be shown that the alchohol is different, it seems wiser to take it in those liquids in which it is formed by fermentation, as good beer or wine, and not by distillation as in spirits. If beer does not fatten, or cause gravel, it is probably better than wine. (Dr. Parkes.)

The following table shows the amount of ardent spirits, wines, cider, malt liquors which contains one ounce of absolute alchohol.

TABLE V. [Dr. Dobell.]

Spirituous Liquors.	*One ounce of absolute alchohol is contained in fluid ounce in*	
ARDENT SPIRITS—		
Proof Spirit	ozs.	2·26
Whisky	,,	2·6
Brandy	,,	2·7
Rum	,,	2·8
Arrack	,,	3·0
Gin	,,	3·2
WINES—		
Roussillion	ozs.	6·4
Sherry	,,	6·6
Cape Madeira	,,	6·8
South African Port	,,	6·8
Port	,,	6·9
Bucellas	,,	7·3
Marsala	,,	7·5
East Indian Madeira	,,	7·6
Frontignac	,,	9·0

Spirituous Liquors.				*One ounce of absolute alchohol is contained in fluid ounce in*
WINES—				
Champagne	...	...	ozs.	12·6
Hock	...	...	,,	13·4
Hungarian Red Voilau		...	,,	14·1
Burgundy	...	...	,,	15·2
Moselle	...	...	,,	15·2
Claret	...	...	,,	16·3
Sauterne	...	...	,,	19·0
Hungarian White Neszemly		...	,,	19·0
CIDER	...	...		64·4
MALT LIQUORS—				
ALE. Burton, Bass	1	84/		12·5
,, ,, ,,	3	60/		14·2
,, Pale ,,	*	0/		19·2
,, India (Gardner X 54)				23·0
,, Bottled { Scotch				19·0
,, Bottled { Edinburgh				——
,, Bottled { Pale				25·0
,, Eight-penny				22·7
,, Family 1-gall				24·9
,, Four-penny				25·4
,, Stout, Dublin Bottled				20·8
,, ,, London				21·5
Porter London				35·6

N. B.—One ounce equals two small tablespoonfuls.

A small wine glassful equals three small tablespoonfuls, or 1½ oz.

THE USES OF CUCA.

The following interesting information is derived from the Extra Pharmacopœia, third edition, by Drs. Martindale and Westcott. It is worthy of perusal by sportsmen and travellers.

Coca, synonym, Cuca. The leaves of the Erythroxylon Coca, a shrub growing on the mountains of Bolivia and Peru. Dose ½ to 2 drachms. They have a slight odour of tea, and a somewhat bitter, aromatic taste. Said to be most active when freshly dried, and are much used by native Indians and others, miners, travellers, to appease hunger and thirst. By them they are chewed with wood-ashes or lime from 2 to 8 drachms or more daily.

Preparations.

A Wine of Coca. 1 in 30. Dose, a wineglassful.

A Liquid Extract. 1 in 6. Dose, 1 to 4 small teaspoonfuls.

An Extract of green leaves. Dose, 5 to 15 grains.

The following uses to which it is adopted is extracted from various scientific journals :—

1. The leaves are chewed to appease hunger and support strength in the absence of food, and used generally for the stimulant and narcotic effects of tobacco and alchohol.—*Practitioner.*

2. Coca leaves, as an inhalation or smoked in a pipe, have a decided effect on bronchial spasm.—*Lancet.*

3. Is of use to steady the nerves of excitable persons; is used by travellers in Bolivia and Peru, and to counteract the effect of rarified air on mountains.

4. Two ascents of Ben Vorlich, under the influence of respectively 60 and 90 grains, done with ease by Sir Robert Christian. By the use of Coca, hunger and thirst are suspended, but eventually appetite and digestion are unaffected; the mental faculties are not affected after great bodily fatigue, except by freeing them from dulness and drowsiness. —*British Medical Journal.*

5. A party climbing Mount Blanc, each chewing 80 grains of Coca during ten hours, were much relieved from thirst by its use. They drank no water, tea, or coffee, and but a limited amount of wine, yet Coca enabled them to make the trip with comparative comfort.—*Medical Times and Gazette.*

6. It enables a greater amount of fatigue to be borne with less nourishment, and lessens the difficulty of respiration in ascending mountain sides.

It prevents the rapid waste of tissue, and enables the consumer to go a long time without food.

N.B.—Any marked corroborative evidence of the effects of this drug would be gladly received by the author.

ANTI-FAT.

The following description of a remedy used to reduce corpulence without diet is obtained also from the Extra Pharmacopœia :—

Fucus, Vesiculosus.—Bladder wrack—Sea wrack.

Preparations of this seaweed, being rich in iodine, bromine and chlorine salts, have, for a long time, had

the reputation of being useful in reducing corpulency. A liquid extract of it has of late been advertised and sold as "Anti-fat."

Preparations.

The Extract. Dose, 3 to 8 grains before meals, given conveniently in 4-grain pills with Althæa.

The Liquid Extract.—Dose, 1 to 2 drachms before meals.

Results.

"Combined with liquid potassœ, reduced the fat of a lad *who* had suddenly become corpulent."

"Extract given with good results."

"A lady lost 20lbs. in nine weeks; a gentleman, 8lbs. in six weeks; anohher, 8lbs. in three weeks, without bad results."

Having never used this drug I cannot speak personally about it. It is quoted, as it might be used in individual cases. For my own part, I should only resort to diet for the reduction of corpulency.

TABLE VI.

Relative Digestibility of Animal Substances.

Articles of diet.	How cooked.	Time of digestion.	
		Hours.	*Minutes.*
Pigo feet (soused)	Boiled	1	0
Tripe (soused)	Boiled	1	0
Eggs (whipped)	Raw	1	30
Salmon trout	Boiled	1	30
Venison steak	Broiled	1	30
Brains	Boiled	1	45
Ox liver	Broiled	2	0
Cod fish (cured dry)	Boiled	2	0
Eggs	Roasted	2	15
Turkey	Boiled	2	25
Gelatine	Boiled	2	30
Goose	Roasted	2	30
Sucking pig	Roasted	2	30
Lamb	Broiled	2	30
Chicken	Fricasseed	2	45
Beef	Boiled	2	45
Beef	Roasted	3	0
Mutton	Boiled	3	0
Mutton	Roasted	3	15
Oyster	Stewed	3	30
Cheese	Raw	3	30
Eggs	Hard boiled	3	30
Eggs	Fried	3	30
Beef	Fried	4	0
Fowls	Boiled	4	0
Fowls	Roasted	4	0
Ducks	Roasted	4	0
Cartilage	Boiled	4	15
Pork	Roasted	5	15
Tendon	Boiled	5	30

TABLE VII.

Relative Digestibility of Vegetable Substances.

Articles of diet.	How prepared.	Time of digestion. *Hours.*	*Minutes.*
Rice	Boiled	1	0
Apples (sweet & mellow)	Raw	1	30
Sago	Boiled	1	45
Tapioca	Boiled	2	0
Barley	Boiled	2	0
Apples (sour & mellow)	Raw	2	0
Cabbage with vinegar	Raw	2	0
Beans	Boiled	2	30
Sponge Cake	Baked	2	30
Parsnips	Boiled	2	30
Potatoes	Roasted	2	30
Potatoes	Baked	2	33
Apple dumpling	Boiled	3	0
Indian corn cake	Baked	3	0
Indian corn bread	Baked	3	15
Carrot	Boiled	3	15
Wheaten bread	Baked	3	30
Potatoes	Boiled	3	30
Turnips	Boiled	3	30
Beetroot	Boiled	3	45
Cabbage	Boiled	4	0

On the use of Salt in Diet.

The constant presence of common salt in the secretions, and the necessity for it in due proportions in the blood, indicate the importance of a proper supply of it with the food. We perceive this in the instinct of animals and in our own craving for it when it does not exist in sufficient quantity in the food. Animals will travel long distances, and brave the greatest dangers, to obtain it. Men will barter gold for it.

The experiments of Boussingault on animals have shown that, although salt mixed with the fodder does not much affect the quantity of flesh, fat, or milk obtained from them, yet it seriously affects their appearance and general condition; for animals deprived of salt, other than that naturally obtained in the food, soon get heavy and dull in their temperament, and have a rough and staring coat. Reulin states that animals which do not find it in their food or drink, become less prolific, and the breed rapidly diminishes in number. This is confirmed by Dr. Le Saine, who says in his Prize-Essay on Salt, that it furnishes the fertility of the male, and the fecundity of the female, and it doubles the power of nourishing the fætus. During the period of suckling, also, salt given to the mother renders the milk more abundant and more nutritious. It likewise acce-

lerates growth, and gives a finer condition to the skin; and the flesh of animals fed with it is better flavoured and more easily digested, than that of animals which do not partake of it. In barbarous times, the most horrible of punishments, entailing certain death, was the feeding of culprits on food without salt; and in the experiments of the French Academicians, flesh deprived of its saline constituents by being washed with water, lost its nutritive power, and animals fed on it soon died of starvation. Even after a few days, with such a diet, the instinct of the animals told them it was worthless as food, and they fed on it with reluctance; indeed, for all purposes of nutrition, it was, as Liebeg says, no better than the eating of stones, and the utmost torments of hunger were hardly sufficient to induce them to continue the diet. There was plenty of nutritious matter in the food, but there was no medicine for its absorption and solution, and hence it was useless.

The great value and importance of salt in diet are, I think, not fully appreciated; and less salt is often eaten by individuals than should be. These remarks more particularly apply to pregnant and nursing mothers and to those interested in the breeding of animals.

The Singara Nut.

The flour of this nut, obtained in large quantities from the Woolar Lake and swamps in the Cashmere Valley, as well as in other parts of India, is very pleasant to look at, and could probably be made into palatable cakes.

At present, I can get no account of its composition. It forms a large item of food amongst the very poor. The natives inform me that a man, however much he may eat of it, will never get fat. It might possibly be found useful in the Banting diet.


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