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TREATMENT.

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CORPULENCE

AND ITS

TREATMENT

ON

PHYSIOLOGICAL PRINCIPLES

BY

DR. WILHELM EBSTEIN,

PROFESSOR OF MEDICINE AND DIRECTOR OF THE CLINICAL HOSPITAL
AT GÖTTINGEN.

NEW EDITION.

LONDON :

H. GREVEL AND CO.,

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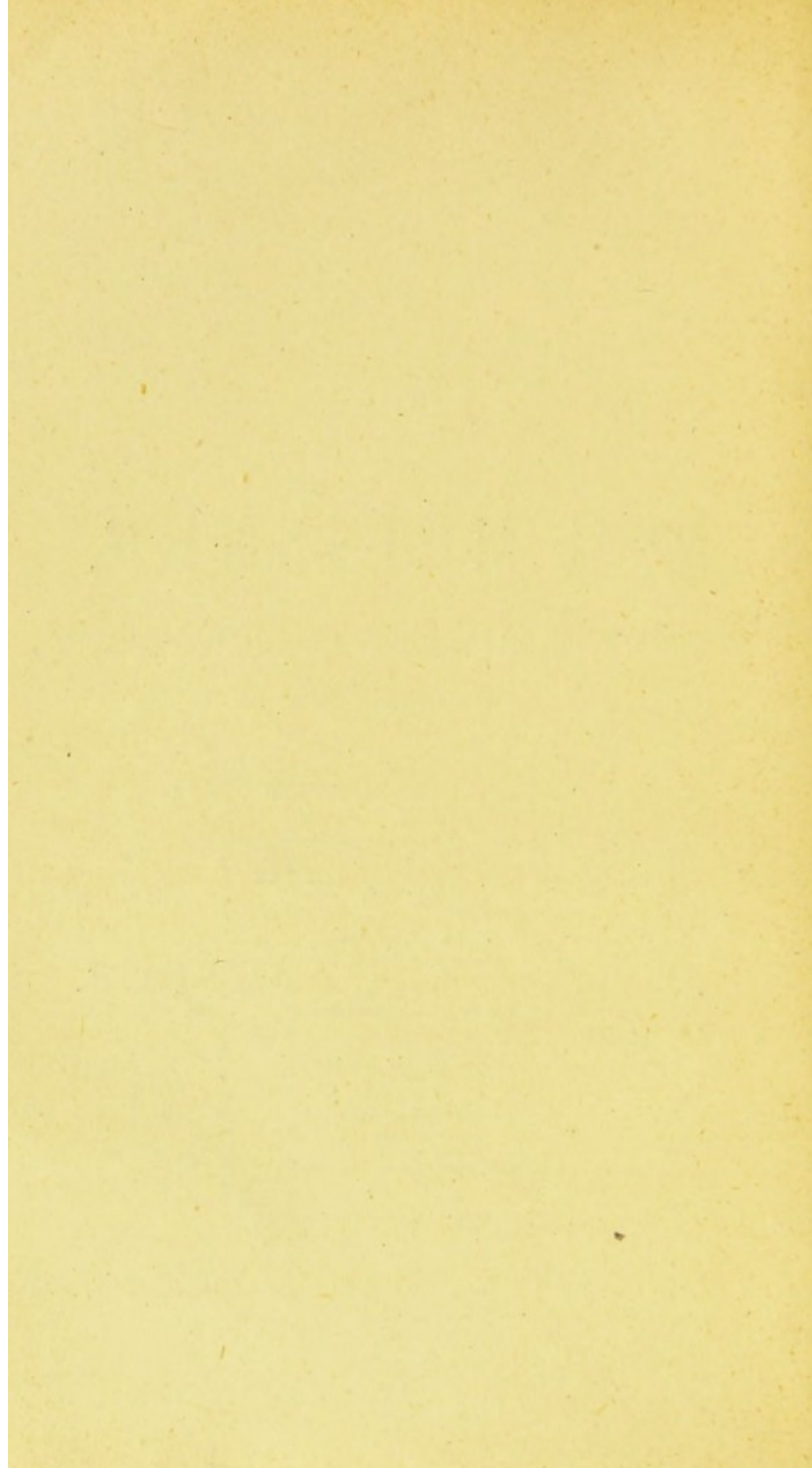
DR. G. MEISSNER,

PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY
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DEDICATED

BY THE

AUTHOR.



Preface to the First Edition.

In the following pages an attempt is made to regulate the alimentary relations of the corpulent on those principles, which modern physiology recognises as in accordance with the conditions of health in the case of the non-corpulent, and which form the basis of a rational dietetic system. The treatise aims more particularly at **substituting for the so-called Banting remedy or cure by avoidance of fat something better and more in harmony with the natural conditions.**

That the present communication takes the form of an address is due to the circumstance, that it is a somewhat fuller development of an address delivered by me on June 3rd before a numerous gathering of physicians at the seventh general meeting of the Lower Saxon Medical Association in Brunswick.

In preparing it for publication I have taken care to adapt it in its most essential part, dealing with the treatment, to the capacity of non-medical readers and above all to that of the scientifically educated circles. After the great popularity obtained by the Banting Cure, it seemed to me in more than one respect desirable that, even outside the professional classes, the reasons for regarding it as objectionable should be fully appreciated.

That in each individual case medical advice is indispensable in applying the dietetic measures recommended by me, is so obvious from the whole tenour of my remarks that there is no occasion here to dwell expressly on it.

Göttingen, July 9. 1882.

Ebstein.

Preface to the Third Edition.

This third edition, also unaltered, of my treatise on Corpulency and its Treatment,

again follows so rapidly on the preceding that I may perhaps be permitted to recognise in it the realisation of the hopes expressed in the last preface.

Göttingen, Nov. 16. 1882.

Ebstein.

Preface to the Sixth Edition.

While the fourth and fifth editions, issued in the March and June of this year respectively, were enlarged only by a few remarks almost exclusively referring to the explanations and supplementary matter appended to the text, in the present edition the text itself has undergone some expansion in the portion devoted to the treatment of the affection. Such additions are the result of my own numerous and protracted experiments, which have again and again convinced me that corpulency may not only be effectually checked for a time by the method here inculcated, but that by it the accomplished results may be permanently

secured. From a series of friendly communications from medical and unprofessional correspondents. I have further perceived that the suggestions contained in this little work have already proved beneficial amongst numerous classes. I have at the same time again abstained from turning to account the copious materials and arguments thus placed at my disposal, especially because I could promise myself no **substantial** advantage from them, and because the book had to be kept mainly within the narrow limits, in which it had not only obtained a wide circulation, but had also proved adequate to achieve the desired object. Meantime a French edition prepared by Dr. CULMANN of Forbach has been issued by the publishing house of M. F. SAVY in Paris. A Danish version in unison with the present edition has also been projected by Messrs. HÓST AND SÓN Publishers to the University of Copenhagen.*

Göttingen, September 1883.

Ebstein.

* This together with a Swedish version has meantime appeared.

The theme which occupies us to-day, dealing with obesity and its treatment, is one of those medical problems, which may probably have exercised the "wise heads in hieroglyphic caps," as it certainly did those "turbaned and black-capped heads, perriwig-pates and a thousand other sweating human brains", of whom Heine sings.

For the beginnings of our experiences on this subject may be traced back to *Hippokrates*, and in my opinion his teaching on a fatty diet hits the nail at any rate very nearly on the head.

In saying that we intend to discourse on Corpulency and Obesity (1)*), which last term is usually employed to denote the high and highest degrees of corpulency, I have at once defined with sufficient clearness the limits of our present thesis. I mean to say that nothing but confusion can arise in a matter simple enough in itself by attempting with

*) These bracketed figures from 1 to 17 refer to the explanations and supplementary matter appended to the text.

Schindler-Barnay to substitute such an expression as "*adipose ailments*" (*Verfettungskrankheiten*) for the terms *corpulency* (*Fettleibigkeit*) and *obesity* (*Fettsucht*). For after all by corpulency we do not understand the so-called cases of "*fatty degeneration*", which often lead so rapidly to the decay and atrophy of the parts affected, to which category belongs, for instance, the fatty degeneration of the muscle-fibres of the heart. I need not here deal more fully with such acute cases of fatty degeneration presenting themselves under morbid conditions, for from our medical practise they are sufficiently well known as extremely insidious, often excessively treacherous forms of disease. It may not however be without interest to draw your attention, at least in passing, to the mighty part played by such processes of fatty degeneration even in well known psychological conditions. Bear especially in mind the perfectly normal and important processes in which fat appears as a result of secretion in the glands, and notably the secretion of the milk glands. Consider further that the contraction of the womb after parturition is itself at least partly a question of the fatty degeneration of its muscle-fibres.

At the same time, although I do not wish corpulence and fatty degeneration to be regarded as equivalent terms, I do not at all deny that in the phase of the question with which we are here concerned, cases of degeneration do arise, and

that distinct transitions exist between corpulence on the one hand and the fatty degeneration of the vital parenchyma on the other. I will here even emphasise the fact that, for instance, under the influence of the poverty of blood associated precisely with the worst forms of adiposity and reaching a very high degree of acuteness, such morbid and serious cases of fatty degeneration often show a certain tendency to develop themselves. Nevertheless what is usually understood by corpulency or obesity still differs essentially from what in ordinary language is indicated by the expressions adiposity or fatty degeneration.

In the case of fatty degeneration the ailment ends with the decay of the affected part; the elements charged with fat become deranged, and succumb to fatty necrobiosis. In the case of fatty infiltrations, obesity or adiposity, in which category ordinary corpulency is comprised, the elements are charged with fat without however ceasing to live. That hitherto no thoroughly decisive criterium has been discovered, enabling us in all cases to distinguish by microscopic investigation fatty infiltrations from fatty degeneration, is nothing to the point, nor does it affect the correctness of the specified facts. In the various degrees of corpulency we are simply dealing with a more or less considerable accumulation of fat, still however always superabundant, in the connective tissues, and in fact primarily in

the subcutaneous connective tissue. As the typical bearer of fat, the latter also rightly takes the name of adipose cellular tissue. For all healthy human beings have in fact some fat in their connective tissues. Even in the case of people usually described as lean some is found deposited in a few places. The quantity oscillates within tolerably broad physiological limits in various individuals, according to the change in their manifold individual relations. So thoroughly has this fact become ingrained in our very flesh and blood, that we at once apply the terms *fat* or *lean* to whatever reaches the limits of the normal state, or oversteps it in either direction. The deposition of fat has already begun about the sixth month of the fetal life, and we all know that a normally developed healthy child born at the right period has been furnished with a relatively speaking very considerable cushion of fat, so that the statements regarding the proportion of fat in new-born infants vary between 9 and 18 per cent of their whole weight. The quantity is thus relatively greater than in the case of adults, in whom the physiological amount of fat has been estimated by Béclard and Quesnay at no more than 5 to 6 per cent of their whole weight. The lower figure refers to men, the higher to women, in whom under perfectly physiological conditions the fatty contents of the subcutaneous tissues would appear to be somewhat more abundant. *Traube* considers a moderate accu-

mulation of fat as something normal in people over fifty years of age. Apart from the physiological fluctuations, the difficulty of the methods of investigation sufficiently accounts for the discrepancies in the statements made on this point. Still we may at once agree with *Vierordt*, who regards as far under the mark the statement of *Moleschott* that the fatty deposits amount to $\frac{1}{40}$, consequently only to $2\frac{1}{2}$ per cent of the whole weight of the body. We know, moreover, that in physiological conditions the fat collects in the subcutaneous connective tissues in certain definite parts of the body, and as everyone knows there is a series of places, which even in the case of persons supplied with a rich cushion of fat, remain, if not absolutely destitute, still remarkably free from fat.

This peculiar disposition of the fatty layers in the normal animal and human organism lends a seductive support to the view represented by *Toldt* regarding the special nature of those parts predisposed to accumulate fat.

Till quite recently the theory, strongly favoured as it has been by the researches of *Flemming*, has been universally accepted, that the formation of the adipose cells proceeds regularly and probably without a single exception from the fixed cells of the connective tissues, so that according to this view the fixed connective tissue cells and the adipose cells are identical. But *Toldt* now looks on the "fatty tissue"

of the vertebrate animals as a special organ, which is in no way to be referred to the connective tissue, but which must be regarded as a specially constructed tissue with a separate and well characterised system of blood vessels and an independent trans-ementation resulting in fat. *Flemming* also has certainly argued for a definite disposition of the vessels for the localities where fat is physiologically accumulated, describing them as small localised foci always exclusively following separate circuits of anastomosis of the small vessels. This disposition consists, according to him, of a sufficiently long local expansion of the vessels. But *Flemming* does not regard the "fatty tissue" as a special organ, and in fact carefully avoids this expression.

Apart, however, from this divergence of views, all observers are still of accord that every connective tissue cell may under certain conditions be transformed to an adipose cell. Even *Toldt* differs from other observers only in as much as he does not accept such a transformation under strictly physiological conditions, regarding the reception of fat in an ordinary connective tissue cell either as a morbid symptom, or as one coming within the conception of the fattening process. *Toldt* by no means assumes what some authors have made him say, that precisely in the case of the corpulent the "fatty tissue" has from the first been deposited by special expansion from its seat, but holds with all others that

in their case the fat has filtered into the connective cellular tissues.

As the outcome of these discussions, we may now accept as tolerably certain, that under physiological conditions *the accumulation of fat* is mainly limited to definite localities of the connective tissues, and chiefly of the subcutaneous tissues. But in the absence of personal research in this field I must leave it undecided whether this predisposition of certain parts of the body rests solely on special dispositions of the vessels (*Flemming*), or whether in them is found a specific organ distinguished by special properties, the "fatty tissue" of Toldt.

Of the internal organs the *liver* alone, and that only temporarily, takes part in the accumulation of fat under physiological conditions. Even the ancients were aware that this of all other organs is the most disposed easily to lapse into a state of fatty degeneration. *Kölliker* was the first to observe that in mammals regularly a few hours after digestion a kind of fatty liver is physiologically developed, and subsequently some considerable time ago Virchow studied more carefully the relations of fat to the liver, showing that a close connection exists between the physiological and pathological forms of the fatty liver. Attention was first drawn by *Meissner* to an obviously physiological form of the fatty liver in egg-laying fowl, where the fat appears to lie mainly outside the liver cells, and is found

neither in cocks, nor yet in those hens that have for some time ceased laying, even when otherwise well nourished. Meissner has brought this form of fat into relation with that of the yolk of egg.

Returning now to the fat in the subcutaneous connective tissues, we find that between normal, abundant and excessive deposits in this region there occur the most manifold graduations. As the quantity increases, the connective tissue cells become more and more converted into adipose cells, that is, into cells filled with a fatty substance. Under the familiar form of fatty globules this substance has been so little understood, that some pains have been needed to establish the true cellular nature of these objects. We know, moreover, that in a chemical respect the fluid contents of these cells, like all animal fat, whether beef or mutton suet, or the soft lard of swine, as well as human fat itself, consist essentially of tripalmitine, trioline and tristearine. But the specific property of these fats, which in appearance and taste can easily be distinguished from each other, and which for every animal species are thoroughly characteristic, depends almost entirely on the various proportions in which the above-mentioned adipose substances are intermingled. For our present purpose it is needless to point out in greater detail, that in various kinds of fat various sebacic acids have also been found, acids which are probably also present as compounds of glycerine in

the fats in question. Even in the same individual the fat is not of uniform composition in all parts of the body. It has for instance been ascertained that in man the fat of the subcutaneous connective tissues contains more oleine than the kidney fat.

Now these layers of fat, which in ever increasing proportions comprise larger or smaller sections of the subcutaneous connective tissues, as well as of those enveloping and interpenetrating the internal organs, may acquire monstrous proportions. The older observers especially have left us a regular anthology of such obese monstrosities — *sit venia verbo* — an account of which may here be safely dispensed with. Let it suffice to state that in such bodies the fat ends by playing a predominant part. Layers of fat inches thick under the skin, especially on the paunch, on the upper part of the thigh, on the breasts and elsewhere, are not uncommon. The large caul may attain a thickness of several centimeters, and a case is mentioned by *Boerhave* in which it weighed 10 pounds. Of the entrails the liver is usually the first to suffer fatty degeneration. But specially noteworthy are the fatty deposits on the heart, — which were already correctly described by *Senac*, and which *Quain* clearly distinguishes from the fatty degeneration of the cardiac muscles, where the fibres composing them become morbidly fat and perish. These fatty layers about the heart follow the universal laws of nutriment, by which the accu-

mulation of fat in bodies is regulated. (2) They may attain such proportions, that the cardiac muscle seems altogether to disappear. In recent times *Leyden* has given us a very careful diagnosis especially of this form of fatty heart, both in its anatomical and clinical aspects.

As regards the symptoms of abnormal fatty accumulations, three stages may perhaps be distinguished. In the first the individual in question is a person to be envied. We admire his stoutness, his embonpoint, the body grows fuller, the outlines become rounded off, the muscular system still keeps pace with the increase of fat. In the second stage the corpulent become ridiculous, and have at all times been the laughing-stock of every body. The ancients jeered at the obese Silenus in the processions held in honour of his foster-child Bacchus, and capacious Falstaff is the popular embodiment of low comedy. The works of the poets are so full of drastic descriptions of the various aspects of corpulency, that pathologists might learn many a lesson from them. In the first period of this stage the corpulent bear with a certain dignity the inconveniences entailed on them by their increasing bulk, and greater bodily weight. These troubles also find at first their compensation in the muscular system rendered more tempered by increased exercise, and an abundant reception of albumen.

There are even some stout people, who despite

more copious perspiration and a slight shortness of breath, (3) still remain lusty pedestrians and knock about whole days in the hunting-field. They disregard such annoyance as they are able to overcome. But the matter becomes serious when they reach the stage in which the "plump face shines like the full-moon, and three men cannot span the paunch". Such people of the Falstaff type with bellies of a hundred pounds are subject to many discomforts. Falstaff bemoans his own fate: "A man of my kidney . . . That am as subject to heat as butter; a man of continual dissolution and thaw".

In these few words lies a whole history of sorrows, which however still fail to excite our sympathy. This unwieldy gait, these bloated features provoke the derision especially of the lean. "There be people", says *Lichtenberg*, „with such plump faces that they may laugh under their fat, so that the greatest physiognomist shall fail to notice it, while we poor slender creatures with our souls seated immediately beneath the epidermis, ever speak a language which can tell no lies".

The gravity of the situation now begins to become more evident to the corpulent themselves. They no longer "laugh under their fat", for to the discomforts prepared for them by the increasing burden of the body and hitherto borne with a certain sense of humour, are now gradually associated more serious derangements, which depend partly on the injury

of some vital organ, especially the heart or liver, partly on a complication of other serious constitutional ailments frequently developed in connection with increasing corpulency. I may remind you above all of that *anemia*, which is always present in high degrees of obesity, and under the influence of which experience shows that a stimulus is given to the deposition of fat. I may further remind you of *gout* and *diabetes*, unpleasant yet frequent associates of corpulency, to the development of which it decidedly predisposes as an incidental cause. In this third stage the corpulent become seriously ailing and pitiable objects of commiseration. But not every obese person experiences all these three stages with their consequences, which I could not here dwell upon in detail without exploring a wide field of special pathology. The corpulent often perish prematurely, either through concomitant disorders, or because one of the specified threatening complications is developed before the deposition of fat in the outer coatings has reached its most acute phase.

How acute this phase may be is well known, and I have already drawn attention to it in describing the anatomical relations of corpulency.

Cases often occur in which the weight of the body reaches and exceeds 100 kilograms, say about 20 stone. But far greater weights are not rare; the recorded figures trespass in fact on the limits of credibility, and many of the older observations

partake of the hyperbolical. The injurious influence of corpulency on the mental activity has assuredly often been exaggerated, and *Grisolles* and *Alibert* rightly insist that the corpulent have on unsubstantial grounds been accused of incapacity for all intellectual exertion.

J. P. Frank observes that there is no lack of intelligent "fat paunches", and history records a whole series of examples of great men who were corpulent. Possibly the climate of the country and the peculiarities of its inhabitants may have an influence sufficient to explain the discrepancies of observers. *Cantani* of Naples describes the influence of corpulency on mental energy as highly injurious. "Fat", he writes, „quenches the divine flame of the mind even before old age has deprived it of the oil of cerebral nourishment". But in any case it must be admitted that increasing corpulency is not favourable to the full development of the mental powers.

Coming now to the diagnosis of corpulency and especially of obesity, this is so simple a matter that as a rule the unprofessional classes themselves hit it off with perfect accuracy. It cannot be illustrated by tabulated surveys of extremes and of averages, as to the proper compass and bodily weight of people of definite age and size. I regard as especially useless material *Quetelet's* estimate which is based on a very limited series of figures,

and which continues still to be frequently and readily quoted and printed. To be convinced of the very considerable limits within which bodily stature and weight may oscillate at the same period of life in otherwise healthy subjects, we need but glance at the extremely careful investigations carried out in these respects by *Beneke* amongst the rank and file of the XI. battalion of Prussian Rifles stationed in Marburg. From these researches we learn that for the present no conclusions can be drawn from such statistical data for the diagnosis of obesity in concrete cases. But in order to decide whether anyone is too fat we have fortunately no need of the help of statistics. Far greater difficulties are presented by the *prognosis* of obesity in the concrete. We know that, as *Hippocrates* had already done, the popular voice still awards but a short life to the corpulent. And in truth they are threatened with dangers on all sides. A moderate supply of fat kept within the limits of the normal is certainly a good resource, which the organism may husband for times of need, and with which it may for a certain term protect the organic albumen from too rapid decomposition. But a superabundant deposit, the more it increases, endangers the existence of the individual for reasons, which I have already made clear to you.

The corpulent become less capable of resisting the baneful influences surrounding them, and when

attacked by an acute infectious disease they rally less easily than those well nourished and equipped with a normal supply of fat. For the prognosis in concrete cases it is of the greatest importance to determine at what rate corpulence is increasing, whether anemia has early set in, whether the internal vital organs, especially the heart, are normally functional. 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. But that the disease advances in this pernicious way depends not at all on a human weakness intelligible enough and pardonable but none the less to be regretted, a weakness which lacks the strength to bear the privations imposed on it by its constitution. From this human weakness, which tolerates just what it fancies and what is convenient, we may conclude that as long as men last corpulency and obesity will exist. This lack of resolution to forego the so-called attractions of life constitutes, *ceteris paribus*, a seriously disturbing element in the prognosis. Where we meet it, where fall unheeded Shakespeare's warning words:

Make less thy body hence, and more thy grace;
Leave gormandizing; know the grave doth gape
For thee thrice wider than for other men.

Henry IV. Part II.

there the prognosis must needs be largely defective.

Now when it is asked under what circumstances, on what etiological grounds these abundant fatty deposits are developed, it is notorious that they are observed more commonly in certain *well-defined classes of human beings* (4). We know that fat accumulates abnormally in people accustomed to a rich and unstinted diet, as well as to frequent and copious alcoholic drinks, while on the other hand exempt from bodily or mental exertion. A powerful factor is also a peaceful existence unruffled by violent emotions or passions, and it is certainly a moot question whether a phlegmatic temperament be the cause rather than the result of an abundant deposit of fat. The last mentioned elements, superinduced by the hard struggle for existence, are naturally more operative with men than with women. At the same time if men often seek in a greater partiality for spirituous liquors a compensation for the inequalities and disadvantages imposed by fate upon them as compared with the opposite sex, this is not the rule, and generally speaking rather of relatively rare occurrence amongst the better classes. From these inquiries however we arrive at least at what would appear to be the main reason why, under otherwise like conditions of existence, women in the higher circles seem more inclined than men to accumulate fat. *St. Germain* attributed the great predisposition of women to embonpoint exclusively to their indolent life, in this respect washerwomen

and cooks alone finding favour in his eyes. His statement that widowers grow lean and widows stout would seem at least in Germany to rest on no very solid or substantial ground. That obesity is furthered by mere bodily rest even under far from enviable conditions, we learn from those who during long years of imprisonment put on a rich coating of fat. That the want of sufficient sunshine as well as of bodily exercise has also a large share in the development of corpulency would seem to have been amply shown by the experiences of those engaged in fattening cattle for the market. There is a charming simplicity in the arguments advanced by *Chambers* to show how favourable is the absence of sunlight to the promotion of obesity. He tells us in all seriousness how a man, who had grown stout in a brewer's cellar, became lean when he entered the same establishment as a porter. But that his corpulence was acquired in the cellars of the brewery, great temperance notwithstanding, can scarcely have met with many credulous souls.

Victims of anemia show a tendency to form and increase fatty deposits, in as much as with the decrease of the red blood-corpuscles the number of conveyors of oxygen is also diminished, thereby rendering oxydation defective and deficient. Thus vanishes the seeming paradox of a medical empirical dictum that obesity, as a certainly not desirable state of embonpoint, sets in as a symptom of illness

in the earliest stages of severe maladies, during which the fat naturally soon disappears again. Herein further lies at least a partial explanation of the fact that after severe ailments and great loss of blood a high degree of corpulency is not unfrequently developed. In such cases however this result is also furthered by too generous a diet, often hastily introduced in compensation for the losses endured.

In the etiology of corpulency a large share is also attributed to the derangements of the sexual functions. But in my opinion their direct influence in the promotion of obesity has been often considerably exaggerated. Is it not notorious that in female animals the ovaries are destroyed to facilitate the fattening process? In the male sex also individual cases of obesity are on record, which at the time of puberty somewhat suddenly set in, associated with a defective development of the penis and testes. But that the arrested growth of the reproductive organs, still persisting without disturbance to the system, cannot have been the fundamental cause of the corpulence, may at once be concluded from the circumstance that in such cases the healing art was able to point at good results in the treatment of the obesity. The statements of writers on the influence of emasculation on the bodily constitution are also characterised by profound discrepancies. There would appear to be almost as many observers to assert that eunuchs grow fat, as others to maintain the contrary, while others

again assure us that eunuchs are neither plumper nor leaner than other people.

As regards the influence of *the sexual constitution of women* on the acquisition of embonpoint, it is commonly asserted that derangements of the monthly courses have much to do with the increase of fat. In non-menstruating women it has been observed to become more abundant, and women have somewhat frequently been noticed to grow stouter when arriving at change of life. On this point *Krieger* communicates a statistical report by *Tilt*, who found that of 282 women, in whom menstruation had altogether ceased for five years, 121 had become more corpulent, that 71 had on the contrary retained their previous figure, while 90 had grown thinner. *Krieger* claims even to have observed a beneficial influence of this increasing embonpoint during the period of their change of life, in as much as they remain free from the nervous complaints so often attending the *cessatio mensium*, whenever these disappear prematurely.

Krieger explains the matter by assuming that by the diversion of the superfluous blood to the formation of fat, all previously existing partial congestions, profuse excretions and nervous disturbances are got rid of. Other women begin to become full-bodied after pregnancies following rapidly on each other, especially when they do not nurse. But even

in women rendered sterile by affections of the uterus or ovary, like results are observed, and *Beneke* thinks that herein a special activity of the liver plays some part, if not a predominant one.

From my own experiences I feel inclined to regard the anemia so frequently present in such case as a decidedly predisposing factor in the genesis of corpulency.

But if we wish to avoid gross blunders in practise, we shall study each individual case in its special development. In my opinion the factors, which cooperate in all these circumstances and which must be taken into account, are of too complex a nature for our knowledge to be much aided by mere strings of figures and statistical returns. The case of gelded animals does not warrant the conclusion that corpulency results exclusively from the cessation of the energy of the ovaries. For to this stockbreeders superadd a special system of forced feeding and confinement to narrow spaces in order to obtain fat animals. *Hegar* no doubt gives a tendency to fatness as a result of the gelding of young swine; he also considers it probable that full-grown spaded animals (cows) may show a greater disposition to put on fat. But when he moreover not very rarely found in the extirpation of both human ovaries a tendency to greater corpulence, this is assuredly not sufficient to assume a direct influence of the ovaries on the development of obesity.

Apart from these individual dispositions, many other things, such as a damp and cold climate ⁽⁵⁾, have been adduced to explain the appearance of corpulency. But as none of these factors are applicable in all cases, recourse has long been had to a certain *constitutional inclination* for obesity. ⁽⁶⁾ This assumption of a special congenital disposition to corpulency is confirmed by daily experience. It is undeniable that in a large number of cases the parents, and even the grand-parents of corpulent persons had also been corpulent. *Bouchard* was able to show heredity in 31 out of 86 cases, that is 36 per cent, and *Chambers* 22 in 38 cases, or 58 per cent. From the beautiful researches of *Roloff* we also know that there are certain breeds of swine which lend themselves specially to the fattening process. This racial peculiarity is the outcome of a particular method of breeding, which consists not only in the selection of proper stock, but also in suitable management and feeding, notably the maintenance of continual rest and fattening food. With the animal in question (pigs and to some extent horses also) this treatment, when continued for several generations, has the undesirable result of rendering the organism so strongly disposed to put on fat, that it accumulates in superabundance not only in the existing fatty tissues, but also in the muscles and in the cells of the glandular organs, thereby weakening their functions. A condition

analogous to this fatty degeneration of animals occurs also occasionally in newborn infants, the so-called "acute fatty degeneration of newborn children," which is not known to be due to the same inherited conditions.

But that an inherited tendency to obesity in human beings is even of very frequent occurrence, appears to be placed beyond doubt by the facts above specified.

This disposition to corpulency has been attributed not only to separate individuals and families, but also to whole races and peoples, and amongst others to the Hottentots and South-Sea-Islanders.

But as to the time of life when this innate tendency becomes manifest, opinions are again at variance. Many assume that it is further developed most commonly in the very tenderest years of infancy, soon however disappearing and not again returning till some later period, in some cases after maturity, in others in the prime of life, but in most cases not till the subject is well advanced in years. This disposition is also supposed to be on the whole more general among women than among men. Instances however of the so-called *congenital obesity* are few and far between. Amongst the observations recorded in the older writings there occurs a whole series of doubtful cases. *Förster* reports an unusual abundance of fat in children that had attained an

abnormal size in the womb, although otherwise well formed. Later on however they are by no means wont to exceed the medium size.

Of observations of more recent date I will mention the following only, as distinguished by a special degree of plumpness.

Wulf (Eutin) describes a child which died at birth, and which weighed 295 oz., with a length of over 24 inches. It was well proportioned, looked like a child three months old, and showed an extraordinary development of the fatty layers and muscles. The parents were not of excessively vigorous bodily constitution, and the mother stated that their three previous children had been born quite as large, though their weight had not been recorded. Nor is there unfortunately any available information as to what became of these children, and how they were further developed. Next to this case observed by *Wulf* comes that of a child mentioned by *Wright*, which weighed 218 oz. *Wulf*, who himself prepared some statistical matter on this point, informs us that no case was known to him of a newborn child weighing more than 195 oz. This was a case observed by *Hecker*.

If such instances of congenital corpulence are to be regarded as excessively rare, and in fact rather as curiosities without any important bearing on the question with which we are here concerned, it may

be further briefly remarked that cases also occur of corpulency acquired during the earliest periods of life.

It has been firmly established, that in particular cases enormous degrees of obesity occur, which begin partly to be developed soon after birth, and reach monstrous proportions in early life. Such instances arise mostly in the female sex, nor can an inherited disposition be by any means indicated in all cases. For the rest, in connection with this obesity amongst children *Meckel* has drawn attention to the fact, that they betray the character of a morbid and precocious development. In an etiological respect these rare cases belong obviously to no particular category. While *Chambers* also treats cases of obesity beginning at birth and increasing during childhood as a kind of deformity usually associated with some other bodily malformation or mental shortcoming, *Grisolles* reports the case of a child which while 12 to 15 months old was so fat that it was constantly threatened with the risk of suffocation, but which lost all its obesity when two and a half years old. Later on it even became somewhat remarkable for its slender and overgrown figure. (7)

But in by far the greatest number of cases so much alone can be asserted in a general way, that corpulency, as I have already pointed out, begins to

set in later on, and that it depends on an *absolutely or relatively abundant consumption of food, relatively* that is to say, in proportion to the *waste of substance*.

This etiological factor may be more or less effectively strengthened by a congenital disposition and by diverse incidental causes. But *in the overwhelming majority of cases*, and to these alone reference will be had in the therapeutic measures to be mentioned further on, *obesity in human beings is nothing more than the analogue of the fattening process in animals*.

As in this process, man also at times grows corpulent with surprising rapidity, when too highly fed, and when the expenditure of substance stands in too crude a disproportion to the quantity of food taken into the system. This very object is diligently pursued by a genuine fattening process amongst many peoples, with whom an excessive accumulation of fat is regarded as an ornament of the female sex. Thus *Hesse-Wartegg* refers to the Jewesses of Tunis, who when scarcely ten years old are subjected to systematic treatment by confinement in narrow dark places, where they are fed on farinaceous food and the flesh of puppies, until in a few months they expand to shapeless masses of fat. The Moorish women also are said with equal rapidity to reach the desired embonpoint on a diet of fresh dates and a kind of mead.

Chambers reports the observation of *Dancel*

touching a young lady, who in order to preserve her figure lived for four days in the week on champagne and iced chestnuts. Her corpulence increased with terrific rapidity, but she got rid of it by returning to a more rational diet. — Many ways lead to obesity, but all have this in common that, in order to become fat, a well developed man healthy from the first must consume more than is needed to keep his body in its normal material state, or bring it to that state.

Now we have satisfied ourselves that after all both corpulency and fattening are always ultimately referable to the habit of life, and especially of alimentation, of the individual in question. This is not the place to expatiate upon the perplexing doctrine of the physiology of diet, a doctrine which has just begun to be formulated. *Henneberg's* new work on the formation of flesh and fat at different periods of life and under diverse alimentary systems, shows how many and difficult moot points still remain to be determined in this connection.

So much may alone be stated in a general way, that in order to avoid or get rid of corpulency, as the case may be, we must do the very opposite of what promotes fattening.

But before entering more fully into the treatment of corpulency in man, we cannot pass over the preliminary question as to *whether and how far the*

various aliments are conducive to the formation of fat.

And first of all we have to inquire, as regards the fat deposited by animals and man himself in their systems, whether it is a question simply of fat *formed* from the food consumed, or of *self-made* fat.

Now whatever view we may take of this matter, all except *Lebedeff* are of accord on one point, that every species of animal has its own specific fatty compounds. The sheep always yields mutton suet, the dog never makes beef suet. Nor are the specified facts overthrown by *Lebedeff's* discovery that, in his dogs when almost starved to death, definite fat compounds, such as linseed oil and mutton suet, which had been administered to them, were deposited in the bodies of these animals not as dog fat, but as substances closely resembling linseed-oil or mutton suet.⁸⁾ For apart from the fact that *Lebedeff's* reports are at variance with the results obtained by very trustworthy investigations, they would at most merely show that a dog, reduced by starvation to a complete state of inanition, behaves in this respect altogether differently from animals in the normal state. But if so much is certain, that every species of animal at least compounds its own specific fatty mixtures, there still remains the further question, whether it composes this fat of the fat received as nourishment, or itself manufactures it from

the carbo-hydrates or from the albuminous corpuscles similarly received into the system.

That in any case all fat is not formed of the alimentary fat, is evident without further discussion from the circumstance that stall-fed beasts and milch-cows admittedly deposit more fat, or yield it with their milk, as the case may be, than they consume. Hence the excess at all events must be formed from the other aliments, albuminous substances or carbo-hydrates, consumed by them.

In my opinion it has yet to be proved that any portion is deposited of the fats, which are taken with our food into the body, so far as it is in a healthy and normal condition. The experiments supposed to have proved this, so far as I can make out, exclusively affected starving and emaciated animals, which had been fed, if not altogether, at least mainly, on fat. *Voit* says that the formation of fat is mostly insignificant in the carnivora, which with the exception of fat consume no food free from nitrogen. ⁽⁹⁾ That this dictum which, for us is absolutely fundamental, perfectly accords with the facts, is unmistakably shown by the daily experience of the dog, our most faithful domestic animal.

The *collie* with sufficient bodily exercise does not grow fat on a perfectly adequate diet, consisting of flesh and fat with a sparing supply of carbo-hydrates. The *lap-dog* on the contrary, which

besides flesh is also fed on delicacies and sweets, that is on carbo-hydrates, is observed to become rapidly plump and fat, although a not to be underrated part is here certainly played by the quiet and comfortable life led by this variety.

On the other hand it is certain that *fat becomes separated from albumen*, $3\frac{1}{2}$ oz. of which yield according to *Henneberg* rather less than 2 oz. of fat. But the share taken by the carbo-hydrates in the formation of fat, as taught by *Liebig*,¹⁰⁾ has now been disproved. This investigator assumed that the large amount of fat found in our stall-fed animals, apart from what may be formed or deposited as the case may be, from the aliments, is produced mainly by the carbo-hydrates, and thanks to his high scientific reputation he was able not only to secure a wide currency, but also a protracted authority for his views. Later on the question was asked whether fat is at all formed directly from carbo-hydrates. In the special case of the carnivora, with which we are after all more particularly concerned, *Voit* comes to the conclusion that from the carbo-hydrates no fat is directly formed. But, when accompanied by an abundant supply of albumen, and on this point there is no doubt, the carbo-hydrates cause fat to be separated and deposited from the albumen. For the carbo-hydrates, the bulk of which owing to their relatively large proportion of oxygen is very rapidly changed by

combustion in the organism to carbonic acid and water, protect a portion of the decomposed albumen from total decomposition, and what thus survives is the fat so rich in carbon.

To this extent the formation of fat is indirectly promoted to a predominant degree by the carbo-hydrates. This they effect when, with a superabundant consumption of albumen, they are themselves relatively not too largely consumed. In an analogous way fats also may indirectly cause fat to be formed from the decomposing albumen; but this danger is incomparably less than that arising from the consumption of carbo-hydrates. For the fats, which are converted into carbonic acid and water far less readily than are the carbo-hydrates, do not promote to any appreciable extent the separation of the fat from the albumen. Like the carbo-hydrates, they certainly diminish the decomposition of the albumen. But the albumen, which is exposed to decomposition with the simultaneous consumption of corresponding quantities of fat, is completely decomposed without leaving fat behind.

In the face of these preliminary physiological remarks, it becomes intelligible why fat is so important an article of diet. To the value of fat as food for children it may be incidentally remarked that *Biedert* has directed attention in a series of valuable writings, which however in my opinion are

far from having yet been sufficiently appreciated in practise. *Voit*, one of the first authorities in the domain of physiological dietetics, has prescribed for a working man 2 oz. of fat daily together with 4 oz. of albumen and 17 oz. of starch-flour.

Voit even considers it better for the working man to take 12½ oz. only of carbo-hydrates, making up the rest, that is about 7 oz. with fat. In any case he regards 17 oz. of carbo-hydrates as the maximum and 2 oz. of fat as the minimum of a working man's allowance. The fat, whose importance in promoting a capacity for labour is universally admitted, benefits the working man, first by limiting the decomposition of the albuminous particles, and thus furthering the formation of organic albumen, in other words, by stimulating the formation of flesh; secondly by checking the development of corpulency, which to the working man is doubly burdensome. The albuminates, which become decomposed with a due consumption of fat, disappear altogether, without remaining at the transitional stage of fat. To the poor labourer, as well as to all others called upon to undergo great bodily efforts and privations, fat thus proves itself to be as indispensable as it is to beasts of burden. The large mass of fat husbanded in the tissues of the hump by well-fed camels, enables them to endure the hardships of the caravan journeys without much difficulty. On these journeys, during which they

are in fact insufficiently nourished, they live mainly on their humps without any great detriment to their bodies. We know that on their fatiguing wanderings chamois-hunters take no provisions rich in albumen, but only fat, and the 8 or 9 oz. of bacon demanded by the emperor of Germany for every soldier when the German army invaded France in the war of 1870, constitute, so to say, an official recognition of the value of fat as an element in a rational dietetic system of men exposed to great hardships.

In the foregoing investigations we have endeavoured to place in a clear light first, the dangers by which the corpulent are beset, whence it also follows why it seems necessary to combat the tendency to obesity; and after further showing, secondly, that, without a superabundant consumption of food corpulency is not at all developed, we have thirdly made it evident that a definite arrangement of diet promotes the development of obesity, in as much as the most favourable combination for its growth is a too plentiful consumption of albumen even when not accompanied by an excessive use of carbohydrates, whereas no danger arises from fats when taken in moderation by healthy active persons. This settled, we may proceed to the most essential part of the subject, that is to say, an exposition of the method by which corpulence may most effectually be *permanently got rid of without detriment to the patient.*

A great number of such *methods of treatment*, described also as "Cures for Corpulency", have been published, and this very abundance suggests the *a priori* reflection that each of the much-vaunted systems must have its weak points and disadvantages.

They may be grouped in two great categories:

1. The Medical, and
2. The Dietetic cures in the wider sense of the term.

These dietetic cures fall again into two subdivisions, namely:

- a. Such as seek to effect the purpose by change of diet, dietetic cures in the narrower sense of the term, and
- b. Such as endeavour to accomplish the wished-for result by a general alteration in the *modus* and *ratio vivendi*.

No further surgical treatment of obesity has apparently been attempted since the tragical fate of a German duke, who in order to get leaner had the fat cut away by a doctor in Upper Italy, and naturally succumbed to the operation (MS. communication from *Professor* and *Dr. de Lagarde*, Feb. 23. 1882).

Let us first of all consider the dietetic method of treatment.

That the dietetic method, and especially a suitable system of nourishment, takes the very first place and plays the chief part, no second opinion prevails amongst physicians. Hence here we shall have only to discuss the means of giving it effect. Let us at once emphasize the fact, that there are a great many dietetic systems, by which a stout person may be made lean in a relatively short time. But every system must be forthwith stigmatised as bad and objectionable, which can be applied as a so-called "Cure" only for a shorter or longer period. For the question is, not merely to reduce the patient temporarily, but to maintain him permanently in good condition, while still in any case preventing a relapse. Hence the diet must be so arranged, that the sufferer may also not only permanently tolerate, but even relish it, in as much as it agrees with him. In this there are always difficulties, which should by no means be underrated.

As people have under all circumstances either eaten or drunk themselves into the state of corpulency to be got rid of, they must once for all forego these pleasant habits of life at the risk of soon growing fat again. For this there is needed a certain firmness and resolution. I know some highly cultured persons endowed with rare intellectual qualities, who say that they prefer to stake ten years of their life rather than renounce their love of good living. And after all it is often enough no easy

matter to convince the corpulent that they can do with a far less quantity of nutriment, and at the same time even enjoy much better health. In the therapeutics of obesity it is not so much a question of a cure, to be got through like a pleasure trip in order thereupon to resume ones former habits and soon grow stout again, as too often happens. But neither is it on the other hand a question of cures fatal to the patient if persevered in too long, as unfortunately happens quite as frequently. *The removal of obesity* resolves itself rather into the question of *a permanent change of habits based on physiological principles*. Starting from these fundamental axioms, we shall now examine somewhat more closely the various dietetic systems.

All so-called starvation remedies must at once be rejected, because, while we are starving we sacrifice albumen as well as fat. And when it has been further shown that in hunger the comparatively easily combustible and oxidable fat diminishes most rapidly, and is only then followed by the blood and organs rich in blood together with the muscles, it becomes at once evident that the anemia necessarily following on starvation imperatively demands compensation after the hunger has ceased, a compensation which through a more plentiful diet must lead to a still greater accumulation of fat.

And here it should be specially borne in mind that the corpulent, as already pointed out, are pe-

cularly inclined to anemia, and that they even endure with difficulty all dietetic cures of a restrictive type when these are not sternly enforced. In the same way are naturally to be reprobated all remedies involving direct loss of blood, which were formerly practised under the form of venesection. In the fattening of animals advantage is in fact still drawn from the circumstance, that the formation of fat is stimulated by bloodletting.

Further, as to the restriction of the corpulent to one description of food, such a method can no more be persevered in than the starvation remedies themselves.

As a certain quantity of nitrogenous substances has to be constantly decomposed in the body, in the exclusive consumption of non-nitrogenous substances the decomposing nitrogenous material will be taken from the body itself, thereby involving the inevitable destruction of the patient. The corpulent, who, *ceteris paribus*, admittedly endure hunger longer than the lean, would also be able to hold out longer on a purely non-nitrogenous diet; for like alimentary fat, that of the body has also a preservative influence on the organic albumen. Still in the long run the effect of such a diet is just the same as downright starvation. In order to maintain the due proportion of nitrogen, so that the organism may suffer no loss in its nutriment, nitrogenous substances must be consumed.

Notwithstanding the vastly important part played by nitrogenous food in human dietetics, those substances that contain no nutritive ingredients except albumen, as for instance flesh destitute of fat, are not proper food for man. As flesh satisfies his demand for carbon only when it is consumed four times in excess of the quantity required to yield the nitrogen needed for his nourishment, such a course would in the first place be far from economical, seeing that meat is one of the dearest articles of food. And then we should very soon find it impossible to consume every day the 90 oz. of pure flesh required for this purpose.

The dietetic systems of treatment now in vogue are based on an almost exclusively albuminous diet. In 1850 *Chambers* had already pronounced in favour of this regimen, his system strictly excluding all fat substances, such as *fat, oil, butter, milk, cream*, as well as sugar. Of starch-flour in the form of potatoes and even of bread he remarked, that they should be looked on with the greatest suspicion. He also insisted on a diminished consumption of liquids.

We thus perceive that strictly speaking *Chambers'* cure differs in no respect from that, by which *Banting* grew lean in the hands of his physician *Harvey*, and which has received the name of the *Banting* cure from the patient, who has written an account of his malady and curative process. From

its specially operative factor *Kisch* has named it the "Anti-Fat Cure" (*Fettentziehungs-Kur*).

Cantani has gone still more vigourously to work. He bars not only all *fats* — *fat meat, fat fish, cheese* (owing to its sebacic acid), but also all *farinaceous preparations, all saccharine foods, sweet and aromatic fruits*. Only when the patient is unable to continue this diet long enough, either through excessive repugnance to meat, or nausea of the stomach, or muscular debility, he combines it with the *Harvey-Banting* system, which also no doubt anathematises the fats, but allows a certain quantity of carbo-hydrates.

Hence these cures have this in common that both alike to the very utmost exclude fats, which they regard as the chief source of the accumulation of fat in the body.¹¹⁾

Now I will by no means deny that a series of cures does result from the *Harvey-Banting* and *Cantani* methods, that is to say, by these means corpulent persons become thin. But on the other hand it must be allowed that:

1. with the present state of our knowledge regarding the physiology of dietetics no cure is in harmony, of which *Voit* declares that in it the largest consumption of albumen no longer suffices to maintain the body in its albuminous condition, and

2. that, to regard the matter as physicians from a purely practical standpoint, in many cases such cures are not easily endured, and must under all circumstances be managed with great caution.

Here I will not speak of my personal experiences, which are not at all favourable; for it might after all be supposed that I merely wanted to clear the ground for my own method of treatment. But I will allow *Immermann* to speak, that is, one of the admirers of the *Banting* system, who has treated this question with great thoroughness. He tells us that in a short time not a few patients, while certainly somewhat reduced in bulk, feel so weak and wretched, that they urgently plead for a suspension of the cure. Others acquire a temporary insuperable loathing for the regimen of flesh, or else are attacked by dyspeptic affections, rendering a further persistence in the diet impossible for the time being and exceedingly difficult even for the future. *Immermann* best avoids the specified evils by prescribing the cure rather by intervals than uninterruptedly for any lengthy period.

But the so-called *Banting* cure need not here detain us further. What has been said should suffice to convince you that it can be recommended neither as rational nor practical. In any case it has the drawback that at best it can only be applied temporarily, in which case by resuming their former

habits of life the patients run the risk of again growing stout. The *Banting*-cure is in fact also one of privation leading to inanition. The same is the case with the other dietetic remedies, which appear still to be recommended, such as the *milk-cures*, as distinctly formulated by *Tarnier*. A milk-cure also is merely a modified form of that based on privation. We know that cow's milk is not so easily assimilated as other animal aliments by adults, who require about $3\frac{1}{2}$ to 5 pints and upwards of milk to preserve their proper albuminous condition. For this purpose $2\frac{1}{2}$ pints are insufficient.

Before proceeding to my own therapeutic measures I may briefly state that those methods of treatment which are unaccompanied by any dietetic regimen are at best useless and inadequate, and unfortunately often absolutely dangerous. The much prescribed drink-cures with the familiar cold or warm, feruginous or non-feruginous Glauber-salt waters, as well as a number of common saline waters, above all the popular "Anti-Fat Cures" (*Entfettungskuren*) in Marienbad, Franzensbad, Elster (saline spring), Tarasp, Carlsbad, Rohitsch, Kissingen, Soden, Homburg etc.; have usually but a very temporary effect in reducing the quantity of fat, and then only when prescribed in connection with some regimen based mainly on that of *Banting*. In these cases butter and fats are strictly forbidden. The more purgative their effects the more cautiously must these

water-cures be applied. In themselves they benefit little, are often injurious, and should not be prescribed *for corpulency alone so far as it is traceable solely to a too plentiful and unsuitable dietary system.*¹²⁾ I need not weary you with examples of the results of such remedies, which must be familiar enough to you in your practise. I will merely briefly mention the case, which has been recorded by Dr. *St. Germain*, and which concerns a medical man, hence probably an autodiagnosis.

The physician in question, who as an hospital-assistant had become stout, a common occurrence enough, weighed 214 pounds when 28 years old, and a few years later on 232 pounds. Then he began to take the Marienbad-waters early, eating roast meats, but no bread or starch-flour. Thereupon he certainly soon lost 29 pounds; but he had to complain of serious debility and palpitations of the heart, besides a sort of chronic diarrhea, obliging him to discontinue the treatment. In 14 days he again picked up the lost 23 pounds and was as stout as ever.

That bodily and excessive exercise also miss the mark, *Banting* himself has given us a most decided proof. He rowed a heavy boat a couple of hours daily and acquired muscular power, but also — a fabulous appetite. And as he yielded to this, he gained more and more in weight; nor did riding and toiling like a day-labourer bring him any nearer to the wished-

for goal. One may certainly soon lose ten pounds and upwards by bodily exercises, which are attended by copious perspiration. Such a loss of weight is observed within three to four days in the case of jockeys, thanks to a certain course of training to which they are subjected, in order to reduce them to the standard required in horse-racing. A like result may be achieved by overwrought alpine excursions. We may and in fact should recommend to the corpulent physical action as well as everything else which, when applied in a rational and discreet way, otherwise promotes the assimilation of material. In such exercises they will also find beneficial and harmless sources of relief, especially when pursued not only as remedies but habitually. But of themselves alone these exercises cannot make good the baneful effects of an improper dietary system.

The strictly medical treatment again seems fortunately to have been generally given up. Nowadays physicians rarely prescribe for obesity the Liq. potassa (Kali carb. and Aq. destill. aⁿ) recommended by *Chambers* for the first stage of the treatment, or diuretics, or the *exter. fuci vesculosi*, or even vinegar. The cod-liver oil sanctioned by *Wunderlich* evidently operates through the fat contained in it, a point to which I shall return later on. Those remedies are also to be absolutely rejected that depend on drastic purgatives, such as are still sometimes employed by the profession in Germany. Nor

is there any need to point out that iodine is no curative of corpulence due either to over-eating or over-drinking.

Let me now endeavour to place briefly before you the fundamental principles on which I proceed, when I rely on the action of the dietetic process in dealing with cases of obesity. And let me state that my *very first* principle is that the result is not to be achieved in a few weeks or a couple of months; secondly that the regimen must be so arranged that for the rest of his life the patient may adopt and adhere to it.

The application of this principle lies in the axiom announced by *Voit* and already communicated to you, that the formation of fat is mostly inconsiderable in the case of meat-eaters, who consume no non-nitrogenous food except fat. Further, for my already explained deductions touching the formation of fat in animals, and especially for the practical consequences to be derived from them, of decisive influence were the oral communications of my respected colleague *Meissner* regarding what he has long taught and recommended on this point in his lectures.

It is self-evident that any person wishing to check and reduce fat acquired by too generous a diet, must consume less food.¹³⁾

Herein our first consideration must be to avoid a state of inanition. That such inanition is neither

being established nor imminent we have two practical criteria, namely :

1. That in patients endowed with a good appetite no abnormal cravings for food be observed, and

2. that notwithstanding the gradual reduction of weight and bulk, no diminution of capacity for work be perceptible.

I would now specially insist that the suitable quantity of alimentary fat must not forsooth remove hunger in such a way as to produce dyspeptic symptoms or injure the digestion; and this I dwell upon because the question has already been more than once placed before me by competent colleagues. It is of course a tacit assumption that the fat like all other human aliments, be of unexceptionable quality. The experiments made on persons suffering from fistula in the stomach, have already shown that fat substances disturb the digestion only when they are consumed too abundantly, and I have myself often enough administered with surprising success alimentary fat to dyspeptics of the worst type, while limiting their allowance of carbo-hydrates. But my own numerous experiences have also convinced me, that in the treatment of corpulency fat agrees perfectly well even with those, who had previously regarded it with nausea. I have even noticed a total disappearance of the dyspeptic affections, which the

corpulent had hitherto brought upon themselves by an improper diet.¹⁴⁾ The patients preserve a good appetite, which they must learn to moderate by yielding only to the actual feeling of hunger.

The reason of this alleviation of the feeling of hunger with a proper allowance of fat in the diet is due to the circumstance, 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 albuminates have been decomposed, fewer require to be replaced. As 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, a smaller amount of drink is needed for its removal. Hence in this way thirst as well as hunger becomes appeased. That fats reduce the craving for food was already known to *Hippocrates*¹⁵⁾, who remarks in the section dealing with those that wish to become fat or lean: "The dishes must be succulent, for in this way we are easiest sated." Very interesting to me was a communication from *Loew*, bearing on the point that the use of fat is also effective in checking the craving for liquids. After the consumption of fat in hot climates he always noticed a diminished demand for water; thirst became decidedly less irksome.

This property of fat to produce satiety more

rapidly, to diminish the craving for food and abate the feeling of thirst, facilitates to an extraordinary degree the introduction of the modified diet. For to the sacrifices which after all must in any case be required of the corpulent, nothing further need be superadded at least in this direction. On the contrary, the permission to enjoy certain succulent things, always of course in moderation, as for instance salmon, pâté de foie gras and such like delicacies, reconciles the corpulent gourmet to his other sacrifices. These consist in the exclusion of the carbo-hydrates. Sugar, sweets of all kinds, potatoes in every form I forbid unconditionally. The quantity of bread is limited at most to from 3 to 3 ¹/₂ oz. a day, and of vegetables I allow asparagus, spinach, the various kinds of cabbage and especially the leguminous, whose value as conveyors of albumen, as *Voit* rightly observes, is known to few. Of meats I exclude none, and the fat in the flesh I do not wish to be avoided, but on the contrary sought after. I permit bacon fat, fat roast pork and mutton, kidney fat, and when no other fat is at hand I recommend marrow to be added to the soups. I allow the sauces as well as the vegetables to be made juicy, as did *Hippocrates*, only for his sesam-oil I substitute butter.

In spite of all this it would be little to the point to say that I treat the corpulent with fat, whereas I simply vindicate the full claims to which fat is entitled as an article of food. I do not suppose

that the corpulent, with whom we are practically concerned, will have to consume anything like the quantity of fat that *Voit* concedes to the working man, or that is allowed to the rank and file of the German imperial army in time of war, say from 7 to 9 oz. daily. I reduce this daily allowance of fat to from 2 to 3 $\frac{1}{2}$ oz. on an average. The quantity of course changes with the individual relations, nor is it the same for every day. Under the influence of this diet it becomes possible to do with a less quantity of meat. This again I reduce to fully one half or three-fifths of the quantity required in the *Banting* system, which varies from 13 to 16 oz. a day.

It is not only desirable but absolutely necessary to give the patients as precise directions as possible on the quality and quantity of their food. In the former respect it is to be observed, that it seems very beneficial to restrict them at first to a definite number of aliments. The treatment is thereby 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 this quantity naturally varies not only with the bodily stature and weight, but also with the various pursuits and powers of endurance in each individual. A more expeditious and rigorous course may be adopted with the corpulent who are young, powerful and free from organic complaints, than with "feeble folk" needing every indulgence. Here we

can do no more than lay down the general principles 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 practise we all of us operate with the same means, some with good, some with indifferent results.

Is all this mere haphazard? Full and thorough account must be taken of the individual relations if anywhere assuredly in the case of the corpulent, always on the lines of the principles here laid down by me.

I am by no means blind to the difficulties thereby created for the physician, difficulties however, which are neither unconquerable nor even greater than in many other medical subjects. A melody may be sung in varying tones, but it must still be the same melody. We are often called upon to approach certain obstinate maladies with an apparent roughness in the interest of the good cause. This may well be, since we are not forsooth groping in the dark. We have a good guiding star in the varying weight and bulk of the patient's body, and above all in his own feelings. You are aware that from the improvement in weight and volume alone no safe conclusions can be drawn respecting his improvement in health. It is notorious that the same symptoms may be produced in a highly unsatisfactory way by new and malignant formations and by oedema.

I am specially on my guard when the corpulent begin to lose weight and bulk under the changed habits of life, although this is of course intended. It must by no means proceed too rapidly, and above all things the subject must meanwhile continue in good health, free from a state of debility or other unsatisfactory symptoms. I allow three meals: Breakfast with tea or coffee without milk or sugar; dinner and supper. Of these the dinner is the most important, nor must its value be impaired by luncheons or so-called second breakfasts. Supper also takes a relatively subordinate position, nor does it otherwise present any difficulties. It is at times more difficult to get rid of the lunch and accustom the patient to do without it. Under all circumstances he must abstain from a so-called evening meal or "afternoon-tea". Of alcoholics I allow at option two or three glasses of light wine either white or red, at dinner. Beer is barred, unless the permitted carbohydrates be duly restricted. But even then there can naturally be a question of only a small quantity of ale.

This dietetic system may be illustrated by a short example. It refers to an otherwise healthy man forty-four years old, who from his twentyfifth year was troubled with increasing corpulence, having till then been thin and lean. Of moderate habits as regards alcoholic drinks, but leading mainly a quiet, sedentary life, he had grown very stout through a

diet very rich in albumen, but poor in fats, combined with a moderate consumption of carbo-hydrates and especially also of sweets. Under the above described regimen, varied occasionally with the addition of a suitable amount of fat, he lost about 6 inches of his girth in nine months or so. The weight, which unfortunately had not been determined at the beginning of the changed diet, was reduced in the last six months by 20 pounds, and this too was brought about slowly and gradually, but steadily. Meanwhile the bodily and mental faculties of this intimate friend of mine had considerably increased, and his general health greatly improved. Before the beginning of the cure fats had been as carefully shunned as they are now coveted.

Although he had never abstained altogether from fat and especially from butter, any large quantity particularly of fat meat had previously been most scrupulously avoided.

The diet observed by this person was as under:

1. *Breakfast.* One large cup of black tea — about half a pint — without milk or sugar; 2 oz. of white bread or brown bread toasted, with plenty of butter. (In winter about halfpast seven, in summer about 6 or halfpast.)

2. *Dinner.* (Between 2 and 2.30 P. M.) Soup often with marrow; from 4 to 6½ oz. of roast or boiled meat, vegetables in moderation, leguminous

preferentially, but also cabbages. Owing to their saccharine turnips were almost, and potatoes altogether, excluded. After dinner a little fresh fruit when obtainable. For second course a salad or occasionally some stewed fruit without sugar.

Beverage: Two or three glasses of light white wine.

Immediately after dinner: a large cup of black tea without sugar or milk.

3. *Supper.* (From 7.30 to 8 P. M.). In winter almost invariably, in summer occasionally, a large cup of black tea without milk or sugar. An egg or a little fat roast meat or both, or some ham with its fat, Bologna sausage, smoked or fresh fish, about one oz. of white bread well buttered, occasionally a small quantity of cheese and some fresh fruit.

No dyspeptic disorders ever occurred, the appetite was always unexceptionable, dinner always eagerly 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 relatively rare long walks.

My experiences have been hitherto confined to an exclusively consulting practise. I hope also to have occasionally the opportunity by means of clinical observations to make more precise researches

on the assimilation of food under such changes in the dietetic regime.

Precisely in the case of anemic corpulency, according to *Immermann* the most common form, this dietetic system has yielded the very best results. I treated a lady, who towards her thirtieth year suffered from a slow but steadily increasing accumulation of fat combined with a high degree of anemia, a sense of debility and extremely rare and defective menstruation. Her stoutness had been developed under the influence of an improper regime, and the use of iron had proved altogether inoperative. Exclusively through the diet prescribed by me her figure was reduced by 4 inches quite within six months, the fat disappeared and with it the chlorotic disorders, and the courses became surprisingly regular, more so than ever before. For the rest in connection with the treatment of anemia *Immermann* himself has recognised the value of fat as an aliment, so that I am the more surprised that for the very common form of anemic corpulency he never attempted to introduce fat into his "bill of fare".

So far as may be judged from my previous experiences, this dietetic system has also proved altogether beneficial, and especially as a preventative, in complicated cases of corpulency and gout, as well as with symptoms pointing at a participation of the heart in the affection¹⁶). Other observers have

recorded analogous experiences, and in a report on fatty heart *von Stoffella* has pointed out that we should not confine ourselves to an albuminous diet, but that a moderate consumption of carbo-hydrates, fats and gelatine is also indispensable. On the application of this dietetic system to gout I have entered more fully in my work on the *Nature and Treatment of Gout*; where I have already refuted the prejudice based on theoretical assumptions, that this disorder is stimulated by the introduction of a moderate quantity of fat into the diet by increasing the formation of uric acid. I must here all the more refer you to that work, in as much as it has been my present intention to communicate my views only on the treatment of corpulency uncomplicated by other disorders. These therapeutic remarks thus incidentally made may still be supplemented by a brief statement on the use of fat in *diabetes mellitus*.¹⁷⁾ In severe cases of diabetes I have now introduced the same dietetic system with the best results in clinical practise, instead of the intolerable exclusive flesh diet borrowed from the *Banting* regime. In this respect I agree on the whole with *Cantani*, who counsels an exclusive flesh and fat diet for diabetes. So far as I remember the late *Dr. Traube* also approved of the use of fat in diabetes and accordingly recommended cod-liver-oil. In some cases of obesity codliver-oil was also apparently with success applied by *Wunderlich*,

who relied on the experience of *Hippokrates* and referred to it.

While enjoining this regimen for obesity we have at the same time discovered a dietetic system, which, *mutatis mutandis*, but still without *essential* change, may also be adopted for their whole life by people showing a disposition to corpulency.

I have now stated the essential point that I had to communicate to you. It is to be hoped that I have succeeded in breaking down the prejudice which, according to the prevailing views on the treatment of obesity, seems to be associated with the use of fat by the corpulent. This I have attempted on the ground of physiological experiences, with which the facts recorded in medical practise fully harmonise. Had the latter done nothing more than prove *that the corpulent may daily take a suitable quantity of fat without thereby growing fatter, they would have forthwith removed the prejudice prevailing against fat*. But we have seen that fat can do more than this, that combined with the albuminous materials and the carbo-hydrates, each in due proportion, it is able to operate effectively against obesity. Now these alimentary substances form the exclusive ingredients in the diet of man, which has only to be readjusted in diverse proportions for the varying conditions of life. Hence there is nothing of an exceptional character in our system,

but *the diet of the corpulent comes within the sphere of the physiological dietetic methods of other persons*, the first principles of which have been announced by *Voit* in his treatise "On Diet in Public Institutions", issued in the year 1876.

The many still moot questions here arising must and will find their solution in due course, and "whoso", writes *Donders* in his work on *Aliments*, "labours with all his innate power in the evolution of this knowledge, and perseveres in his efforts to secure acceptance for the results of his researches, that man works on a broad basis for the evolution of mankind". In both directions infinite good may be wrought by the physician. Here are many questions awaiting solution at our hands — intelligent, urgent, vastly momentous questions. When we take them in hand and endeavour to solve them with all the earnestness of scientific men, then, once more to return to the poem of *Heine* from which I quoted a few lines at the opening of our discourse, then we shall not need like „fools to bide the answer”.

Illustrations and Addenda.

1) Page 1. Synonymous Expressions for Corpulency.

The affection with which we are here concerned, bears diverse names. Besides the terms *plumpness*, *obesity*, *Stoutness*, *adiposity*, we meet with *embon-point* and *corpulence*, both indicating a still thoroughly comfortable condition, in which besides the fat the whole body itself and especially the muscular system, increases in bulk. The expression *polysarcia adiposa* used by *Cantani* denotes at once a middle state, in which the fat compared with the increase of flesh acquires considerable prominence, while *lipomatosis universalis*, *pimelosis* (πιμελή flabby fat) or *pinguedo nimia* have exclusive reference to the increase of fat. The expression *retentio adiposa* employed by *J. P. Frank* seems to be obsolete, and as little applicable as *polypionia* formerly occurring here and there; *πῖον* denotes *fat*, *plump*, but still rather in reference to fertility. The term *adeliparia* proposed by *Alibert* appears to me never to have really been adopted in France.

2) Page 10. Relation between Peri-Cardiac and Bodily fat.

In individual cases depending mainly on local causes a disproportion is observed between the bodily and pericardiac fat. In this respect there is noticed not only a greater diminution of the pericardiac as compared with the bodily fat (pregnancy, hyperplastic pulmonary emphysema, increase of volume in the heart with a relatively narrow thorax), but also the opposite phenomenon (marastic form of pulmonary emphysema and diminution of the volume of the heart). On these and other questions touching the pericardiac fat compare *W. Müller: Die Massenverhältnisse des menschlichen Herzens. Hamburg and Leipzig 1883, pp. 61—66.*

3) Page 11. Asthma in the first stages of obesity.

The asthma, which causes so many troubles to the corpulent in the first stage especially in certain bodily exercises, is not to be referred to irreparable lesions of vital organs, but is essentially of a functional character.

Traube rightly attributes the difficulty of breathing felt by the corpulent in slight physical exertions

- a) on the one hand to the greater development of the region of the paunch, and consequent upward pressure on the midriff, and

- b) on the other to the greater resistance offered to the action of breathing in the strain of the midriff and basin of the paunch.

Traube refers to a remark made by *Hoffmann* on this point. He regards this form of asthma as lighter and more transitory, and speaks of it to the point as an affection frequently met with in the corpulent and obese. Simultaneously with it there often develop themselves treacherously and insidiously those serious disturbances of the breathing process, that are to be referred to alarming affections of the heart resulting from obesity.

4) Page 16. Etiology of inherited Corpulency.

Traube distinguishes corpulency into that which affects

- a) people of sound constitution from birth, who with an abundant development of flesh also show a healthy colour of the lips and cheeks, a vigorous muscular system and an elastic skin, and that which affects
- b) pale people with a weak and debilitated muscular system and a flabby *panniculus adiposus*, "pasty" as it is called, people who take relatively too much nourishment considering their permanently sedentary life. In this class he also includes the learned and women during their climacteric years.

In both categories a relatively too abundant diet is generally to be regarded as the cause of the increased deposit of flesh. Only in the case of the lower classes it is mostly a question of excessive indulgence in spirituous drinks.

Of the first group, that is, vigorous corpulent people from birth, he holds that they can stand bloodletting, purgings and iodine and derive good results from the thermal waters of Carlsbad, and the Marienbad Kreuzbrunnen well, whereas for those of the second category, that is, the "pasty" those mineral waters must alone be prescribed, such as the Ragoczy at Kissingen and the Elisabeth at Homburg, that do not enter deeply into the nutritive process, but limit their action almost exclusively to the intestinal canal. To show how well robust stout people can stand such energetic onslaughts *Traube* mentions 1) a corpulent person 49 years old, from whom for a slight exsudative pleuritis accompanied by violent pains and extreme difficulty of breathing about five pounds of blood were drawn within a period of from 36 to 48 hours, and who had also to be strongly purged. The patient recovered so rapidly that he could be dismissed from the hospital on the 14th day; 2) he reports an observation of the elder *von Graefe* respecting a man in his 37th year, who with a healthy appearance suffered constant attacks of asthma of really suffocating character in consequence of his corpulence. Under a system

of bloodletting, strong purgatives and iodine his weight was reduced from 400 to 230 pounds, and his asthmatic disorders were at the same time removed.

On this statement of *Traube* it is to be observed that people of robust health from birth, who grow stout, are also subject sooner or later to anemia, so that the second category of corpulent people as described by him is often nothing more than an advanced stage of the condition at which those of the first category have arrived. That anemia is in itself occasionally an important factor in the development of corpulency, I have, above duly pointed out. Whether and how far such drastic measures are called for, as are here applied by *Graefe* and *Traube* to maladies of corpulent people, cannot be decided in a general way, but must be determined in concrete cases. So much alone may be stated, that these should seldom be adopted, and that only in urgent cases recourse should be had to the general bloodletting, which is nowadays very seldom applied.

5) Page 21. Influence of a damp atmosphere on the production of corpulency.

Alibert dwells in a certainly somewhat hyperbolic manner on the influence of a warm and moist atmosphere on the development of corpulency. He mentions the experiences of hunters, to the effect that a mist suffices to fatten the ortolan.

He also tells us that he observed a young lady in Brittany become stout and lean and viceversa within 24 hours under a change in the weather. He holds that a like result may be brought about under the influence of joy and grief.

6) Page 21. Congenital disposition to corpulence.

To his two just mentioned categories of stout people — the robust and flaccid — *Traube* adds *a third* in the following passage: "Lastly there are people in whom there exists from birth a so far unexplained disposition to stoutness, a disposition which shows itself in early lifetime, and which appears referable to a defective process of oxydation". On this I would remark that I do not believe anyone will become fat through this disposition *alone*. The person so inclined grows stout through a dietary system, under which a person not so inclined preserves his ordinary bodily constitution. But to put on fat a plentiful consumption of food is always necessary, and herein an important part is often enough played by an improper arrangement of the dietary relations.

7) Page 24. Congenital corpulence and its development in early childhood.

As regards corpulency in the fetal state, the older observations have been brought together by my respected friend, Medical privy Council *Graetzer*

of Breslau. Several of the cases previously considered must clearly be excluded from this class. In the observation of *Sandifort* which I have looked into, there was a question, for instance, of tumefaction not only in the cuticle of the thorax, arms and neck, but also in some of the muscles. For the rest there are obviously *perfectly distinct etiological relations, under which corpulency is developed either in the fetal state or in early infancy*. In the case of children born too fat, there seems to be always a question of some kind of gigantic growth. I have mentioned such cases in the text, and *Graetzer* describes a preparation in the Breslau Anatomical Museum concerning a child that had to be delivered with the forceps. At its birth it was so strong and plump that it weighed $17\frac{1}{2}$ pounds, but did not long survive. Then there are also cases of children described as furnished both with enormous pinguity and bodily strength, cases which must also be included in this category. The five years old child mentioned by *Tulpius*, that weighed 150 pounds and was at the same time prodigiously fat, manifested none the less as much strength in hands and arms as a man twenty years old. But it is not stated when this excessive growth began to be developed, whether in the womb or not till after birth.

Now it may happen that a person may acquire early in life a relatively large stature, the matter so far resting there, while the volume of the body goes

on increasing. I have, for instance, observed the case of a young lady now in her 25th year, who was already 5 feet tall when only 11 years of age, at which period she already began to menstruate. At that time her body weighed 92 pounds, and has now increased to 150 pounds, while her stature has remained the same.

In by far the greater number of cases obesity seems to arise in children, just as it does in adults and under the same predisposing conditions, through over feeding, a genuine fattening process.

Alibert has already called attention to the fact, that cases of general obesity are very common among Parisian children, and that it has become as sort of commercial speculation, the parents exhibiting their stout offspring for money. Fortunately in Germany such cases belong to the category of curiosities. On the other hand it very frequently happens, that during convalescence after severe illnesses, children develop corpulency for the reasons above stated (p. 24). Lastly mention should be made of those cases in which, as a concomitant phenomenon of idiotcy or serious cerebral affections acquired in childhood, a voracity sets in highly favourable to the development of obesity in such unfortunate persons.

For an interesting communication on the corpulence of a child I am indebted to my colleague Herr

Fischer of *Massow* in Pomerania (Letter received on February 13. 1883). It concerns a six years old child weighing 137 pounds, with a stature of 46 inches, girth 46 inches and circumference of head 24 inches. Herr *Fischer* saw the child for the first time when about 18 months old. But he lacked at that time the opportunity of determining bulk and weight. He treated the patient when six years old for inflammation of the lungs, and did not then notice any considerable emaciation. The child which had had an attack of typhus one or two years previously, had from the first been large-sized and fat. It was the offspring of middle-sized parents uninclined to corpulency, and the father was in fact small and shapely. It has three older and two younger brothers and sisters, who betray no tendency to stoutness. The parents lived in narrow, at times needy, circumstances. As I perceive from the photograph lying before me, the child has a very intelligent and animated expression of countenance.

8) Page 27. On the influence of feeding on the melting and freezing point of fat in fattened hogs.

Lebedeff's experiments find a certain degree of analogy in certain agricultural experiences connected with stall-feeding. I may refer to the following statement of *O. Rohde* respecting the fattening of swine: "The Constitution of the fat in reference to

the melting and freezing point shows itself most favourably when fed on barley and pease. The researches made in connection with the melting point yielded the subjoined results. The fat obtained from hogs fed on

<i>Barley</i>	melted	at	106	F.
<i>Pease</i>	„	„	104	„
<i>Bran</i>	„	„	102	„
<i>Oats</i>	„	„	100	„

On the other hand the freezing point of the fat was reached with

<i>Barley</i>	after 1	hour	at	90	F.
<i>Pease</i>	„	1 ¹ / ₂	„	„	86 „
<i>Bran</i>	„	3	„	„	80 „
<i>Oats</i>	„	6	„	„	76 „

The fat yielded by a maize diet is reported to be of a soft and oily character.

9) Page 28. Touching the accumulation of fat in the carnivora treated with fat.

That the consumption of fat favours the formation of fat with the carnivora, must be denied after the experiences of *Voit*, who in his physiology of the general conversion of substance and nutriment, pag. 238, says: *In the carnivora, which besides fat take no aliments free from nitrogen, the formation of fat is mostly inconsiderable; but it increases as with other domestic animals on a mixed*

diet with an excess of carbo-hydrates." Whether *Voit* here means fat formed from albumen, or the deposition of a portion of the fat consumed as food, makes no difference in the present connection. For us it suffices to know that little fat is formed by the carnivora, seeing that besides fat they consume no aliments free from nitrogen.

10) Page 29. Liebig's views on the formation of fat, as well as on the formation of fat from carbo-hydrates.

Liebig thouroughly understood the formation of fat from albumen. In his organic chemistry as applied to physiology and pathology, Brunswick 1842, p. 89, he remarks: "Whether fat is formed from a decomposition of the fibrine or albumen, or arises from starch, sugar, gum or fat etc. etc."

Touching the formation of fat from carbo-hydrates themselves, *Soxhlet* (Reprint from the Journal of the Bavarian Agricultural Society, August 1881, p. 13), came to the conclusion in connection with swine-fattening that the albumen taken as food could supply only a small portion of the newly-formed fat of the body, and that the latter must at least to a large extent be formed from carbo-hydrates.

For the reception of the two foregoing references I am indebted to my respected friend *Henneberg*.

II) Page 38. Dietetic Prescriptions in the Cures which exclude fat.

It may interest the reader to have somewhat more detailed particulars on this point.

Chambers gives us the following special bill of fare:

Breakfast should be taken early and form a substantial meal as a preparation for the day's work.

Its solid part should consist of two mutton chops with all the fat carefully removed, fried or thoroughly cooked, and ship biscuits. By way of change a pigeon, a little game or fish of about the same weight. For drink sodawater, or common water, or if absolutely necessary, a cup of tea with a thick slice of lemon instead of sugar in Russian fashion. For lunch the same solid food, and for drink claret or burgundy and water in equal parts.

Dinner had best be taken about six o'clock; soup and fish should be avoided, and thoroughly done mutton or beef, especially the former, should form the foundation of this meal. Then some biscuit and such vegetables as contain much insoluble chlorophyl and some starch, such as cabbage, lettuce, spinach, French beans or celery in small quantities, but no potatoes. In a word the dinner must, as far as possible resemble the meal of a *carnivorous animal*. Sweets, eggs and beer are to be shunned

like poison. After water the best drink is claret, champagne the worst.

To *Chambers'* demand that the corpulent should nourish themselves like the carnivora, entire consent could be given, if he did not require *all the fat to be removed from the mutton-chops*. As far I am aware flesh-eating animals do not adopt such complicated arrangements, but eat the muttonchops fat and all.

Banting's bill of fare consists of the following aliments:

Breakfast: 4 to 6 oz. of beef or mutton, kidneys, fried fish, ham, any kind of cold meat except pork, a large cup of tea, but without milk or sugar, some biscuit, or 1 oz. of dry toast.

Dinner: 6 to 7 oz. of fish, salmon excepted, or meat, hog's flesh excepted, or any poultry or game; any vegetables except potatoes; 1 oz. of toast or any kind of jam.

Two or Three glasses of red wine, sherry or medoc, champagne, port and beer being forbidden.

Afternoon: 2 to 3 oz. fruit, one or two biscuits, a cup of tea without milk or sugar.

Supper: 3 to 4 oz. of meat or fish, as at dinner, and one or two glasses of red wine.

As a "night-cap" if needed, a little toddy (with red wine or rum but no sugar), or one or two glasses of red wine.

Amongst things to be avoided to the utmost his physician mentioned to *Banting*: *Bread, butter, milk, sugar*, beer and potatoes. In the bill of fare for the corpulent, as modified by *Vogel* for German use, the prohibition of butter stands out very prominently, the exclusion of very fat articles of food is insisted on, but carbo-hydrates are allowed to some considerable extent, and even a couple of potatoes, with an occasional glass of champagne. *Vogel* respects the old dictum "fat makes fat". Is it well-founded? — Nothing more would seem to have been established than that animals, which after long fasting retain little flesh but much fat, deposit a portion of this fat. The experiment appealed to by *Voit* as decisive for the deposit of fat taken as food is due to *Hofmann*. The case is that of a small dog, which after losing 23 lbs. of its weight (59 lbs.) through a 30 day's fast, by feeding on as much bacon as possible and little flesh had accumulated 48 oz. of the 66 oz. of fat reabsorbed in the intestines. Consequently 18 oz. had been used up. Are we from this to assume that the fat consumed in due proportion with the normal amount of food, that is, from 2 to 3½ oz., helps to increase the fat of the body? Without wishing in the least to deny that under certain circumstances the fat taken with our food becomes deposited as fat, this is by no means demonstrated for the healthy animal organism enjoying normal bodily exercise and under a proper

arrangement of the several articles of nourishment. The dictum "fat makes fat" belongs to those dogmatic assertions which must be taken "with a grain of salt", and which are in fact accepted only in this way. For, were it really true that fat makes fat, it would not have held its place either in practise or theoretically as a highly important aliment, as has been above fully explained by me, seeing that at all times the growth of fat has been regarded as a disagreeable circumstance.

Banting's own dietary system is less unfavourable to fats than the prescriptions of subsequent observers. He condemned pig's meat, but allowed ham; of fishes he excluded salmon alone and permitted all kinds of poultry.

All subsequent more or less modified forms of the so called *Banting* system, commit the serious mistake of restricting fats and carbo-hydrates alone, but not the albuminates, for the corpulent. Besides the above-mentioned disadvantages, a serious limitation of non-nitrogenous aliments, which are nevertheless so absolutely necessary for the existence of the organism, brings about great disturbances in the process of conversion, as has been acknowledged by *Voit* himself in his *Physiology of the general conversion of Material and Nutriment* (compare p. 316). Other physiologists also, as for instance *Landois*, have dwelt upon the fact, that

in the treatment of Corpulency, a general reduction in all the articles of food is necessary. Our experiments with various persons have shown, that nothing so greatly facilitates this reduction as the addition of a due proportion of fat to the diet. Thus also has been confirmed the axiom of *Hippokrates*, who thought that to lose their embonpoint people must eat fat.

12) Page 41. On the application of mineral water cures in corpulency.

As regards the strong objection to mineral water cures in corpulency, I do not wish to be misunderstood. I mean only that no such cures should be adopted for simple cases of obesity caused as is usually the case by overfeeding. This refers above all to the cures with *Glauber-salt waters*. In this connection we may literally accept the statement of *E. Pfeiffer*, in his highly esteemed work: "*Wiesbaden or Carlsbad? Common salt or Glauber-salt? (Balneological Studies on Wiesbaden. Wiesbaden. 1883, p. 63.)* On the other hand there is of course no occasion to emphasize the fact that in all complications and their consequences requiring medical treatment as well as a dietetic regimen, the various water and mineral water cures also naturally reassert their just claims to consideration. But to dwell more in detail on their virtues is foreign to the scope of this treatise.

13) Page 43. On the Restriction of food in corpulence due to overfeeding.

The restriction of the quantity of food is absolutely the first postulate for anyone 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 cure as ordinarily understood. From the above statement it follows, that this limitation should not apply merely to one or another article of food, but that all must be properly adjusted one to the other. How far the limitation should be carried is a question depending too intimately on the actual individual circumstances to allow of any general law being laid down. Herein to hit off the happy medium is an all important element in securing longevity. In this connection a little book by *Cornaro* (1462—1566) presents some interest. He describes the system by which he attained the good old age of 104 years. After leading a luxurious and extremely dissolute life up to his fortieth year, he began on the advice of his physician to live in an exemplary and temperate way, thereby getting rid of all his maladies within a twelvemonth. He accustomed himself never to rise from table so sated, as not to be able to enjoy a little more food or drink. Of bread, yolk of egg, meat and soup he daily took exactly $\frac{3}{4}$ of a pound with 14 oz. of liquid. He tells us expressly that

he felt all the worse when overpersuaded to increase his daily allowance of solids and drink by two ounces respectively, and he accordingly soon returned to the previous regimen, of which, however, he does not give us a detailed statement. Only from the prominence given to the yolk of egg we perceive that in his system due consideration was given to fat. He abstained from such things as did not agree with him, such as fruits and fish, which he expressly mentions as disagreeable. Unfortunately *Cornaro* omits to say whether he was fat or lean at the time when he changed his habit of life, merely stating that, when this took place he suffered from stomach-ache and frequent pains in his side accompanied by symptoms of gout and a constant state of low fever.

14) Page 45. Whether the Dyspeptic should eat fat.

That the healthy stomach readily tolerates a suitable quantity of fat in its nutriment needs no special elucidation after what has been above stated. In his "Longevity" *Hufeland* specified a certain quantum of fat as necessary for the digestion of the albuminates, stimulating their assimilation to the blood. The administration of *fat in dyspepsia* as above briefly touched upon calls for a few further remarks, practitioners being on this point far from unanimous. In his well-known valuable treatise on *Stomachic Complaints* (see *Ziemssen's* complete works

VII, 2, p. 81, 2nd ed. Leipzig 1878) *Leube* writes: "No less questionable is it to permit the administration of fat to patients affected by chronic stomachic catarrh. Apart from the fact that scraps enveloped in fat are less accessible to the gastric juice and consequently not subjected to the preliminary digestion effected by this juice, fat acids may become separated from the fats in the stomach, and contribute their share to the troublesome rising of the acid and rancid contents of the stomach, heart-burn and the like". I have above briefly described my own experiences with fats in the development of dyspepsia, so far as lies within the scope of this work. But they are not to be applied to cases of dyspepsia arising from a *mechanical incapacity of the stomach*. Here I will merely add that I do not stand alone in my views on the consumption of fat in stomachic complaints; or the contrary even on a cursory glance at the literature of the subject I find the same views in *Bartels*, who so regulates the diet of people affected by enlargement of the stomach that the patient receives the proportion of albuminous particles, fats, carbo-hydrates, salts and water required by an adult. (Compare *Müller-Warnecke* Berl. Kl. W. 1877, No. 3, p. 433.) The *Dilatatio Ventriculi* certainly affords a favourable field for the fostering of dyspeptic symptoms. These are not conditioned by good fats, but precisely by the carbo-hydrates, which *Bartels* also introduces only in the delicate

form of purée of potatoes. He also concedes purées of the leguminous vegetables (pease and beans). As a further provision in the cure of enlarged stomach *Bartels* mentions the constant administration of the same aliments, because the patient loses the desire to overload the stomach through the very monotony of the diet. In dealing with the diet of the corpulent I have above already insisted on its limitation to a few articles of food, especially because mistakes in quantity and quality will thereby be more easily avoided. But the point of view suggested by *Bartels* is also naturally of great importance precisely in the case of overfed corpulent persons. With these a great part is especially played by variety, "the source of joy below, from which still fresh revolving pleasures flow", thus leading to excess in the quantity of food consumed. That fats of good quality are of themselves injurious to the digestive function, finds again no support in physiological experiences. The researches of *Frerichs* in his standard work on digestion could do no more than confirm the experiences of previous observers, such as *Tiedemann* and *Gmelin*, *Bouchardat* and *Sandras*, *Blondlot*, *Bernard* and *Barreswil*, that in the stomach fats undergo no essential change beyond liquefaction through heat. The same view is also endorsed by *C. A. Ewald*.

15) Page 45. On Hippokrates' recommendation of fats in the treatment of corpulency.

Hippokrates' dietetic prescriptions for the corpulent I herewith append in *Littré's* accurate French translation: "4. *Du régime à suivre pour perdre ou gagner de l'embonpoint.* Les gens gros et tous ceux qui veulent devenir plus minces, doivent faire à jeune toute chose laborieuse et se mettre à manger encore essoufflés par la fatigue, sans se rafraîchir, et après avoir bu du vin trempé et non très-froid; leurs mets seront apprêtés avec du sésame, des douceurs et autres substances semblables, et ces plats seront gras; de cette façon on se rassasiera en mangeant le moins; mais en outre on ne fera qu'un repas, on ne prendra pas de pain, on couchera sur un lit dur, on se promenera nu autant qu'on le pourra. Ceux au contraire qui de minces veulent devenir gros, doivent faire tout l'opposé de ce que je viens de dire et n'exécuter à jeune aucune chose laborieuse." *Oeuvres complètes d'Hippocrate*, Traduction nouvelle etc. par E. Littré. T. VI. Paris 1849. p. 77.

16) Page 52. Dietetic measures in the Treatment of fatty Heart.

In dealing with fatty heart, as an incidental phenomenon of general corpulency in the above

sense (p. 52), most recent writers on *diseases of the heart* express themselves to the effect that fats are to be avoided as an aliment stimulating the formation of fat. *Stokes*, to quote one authority, prescribes for this malady a diet that shall be nourishing without increasing the bodily weight and especially the formation of fat, and he disallows all fat-containing foods. Others, such as *Friedreich* and *von Dusch* in their well-known writings on complaints of the heart, recommend the application of the *Banting* system for this form of fatty heart. In his *diseases of the heart* (Erlangen 1866. Lectures, Vol. I. edited by *Stoffella*) *Oppolzer*, speaking of fatty heart resulting from a general increase of fat, rightly warns us against strong restrictive remedies, to which category the *Banting* cure surely belongs. According to my own above detailed experiences, very beneficial results are also obtained from the diet proposed by me in such cases of corpulency as the heart takes part in, in the sense already explained.

17) Page 53. Use of fat in Diabetes Mellitus.

Cantani requires that, *whether fat or lean, the diabetic patient shall take flesh and fat, and nothing else* at all meals. He forbids butter alone, owing to the traces of sugar of milk contained in it. He allows *as much fat as possible*, provided it can be endured. The prescription of fat in Diabetes is

obvious enough. Being more combustible than albumen, the fats preserve it from decomposition, and, as above explained (p. 30) keep it both from complete destruction and from the transitional stage. For fat has also certain relations to diabetes mellitus. In dealing with the corpulent and those inclined to obesity we endeavour by a due supply of nutritive fat to counteract its development or its further progress, and in so doing we at the same time circumscribe the elements favourable to the genesis of diabetes mellitus. In this respect also the reception of fat in due proportion is of great importance to the corpulent, who may be described as on the high road to diabetes. (Compare my article on the *Dietetic Regimen for Diabetes mellitus*. Aertzliches Vereinsblatt für Deutschland. May 1883.)

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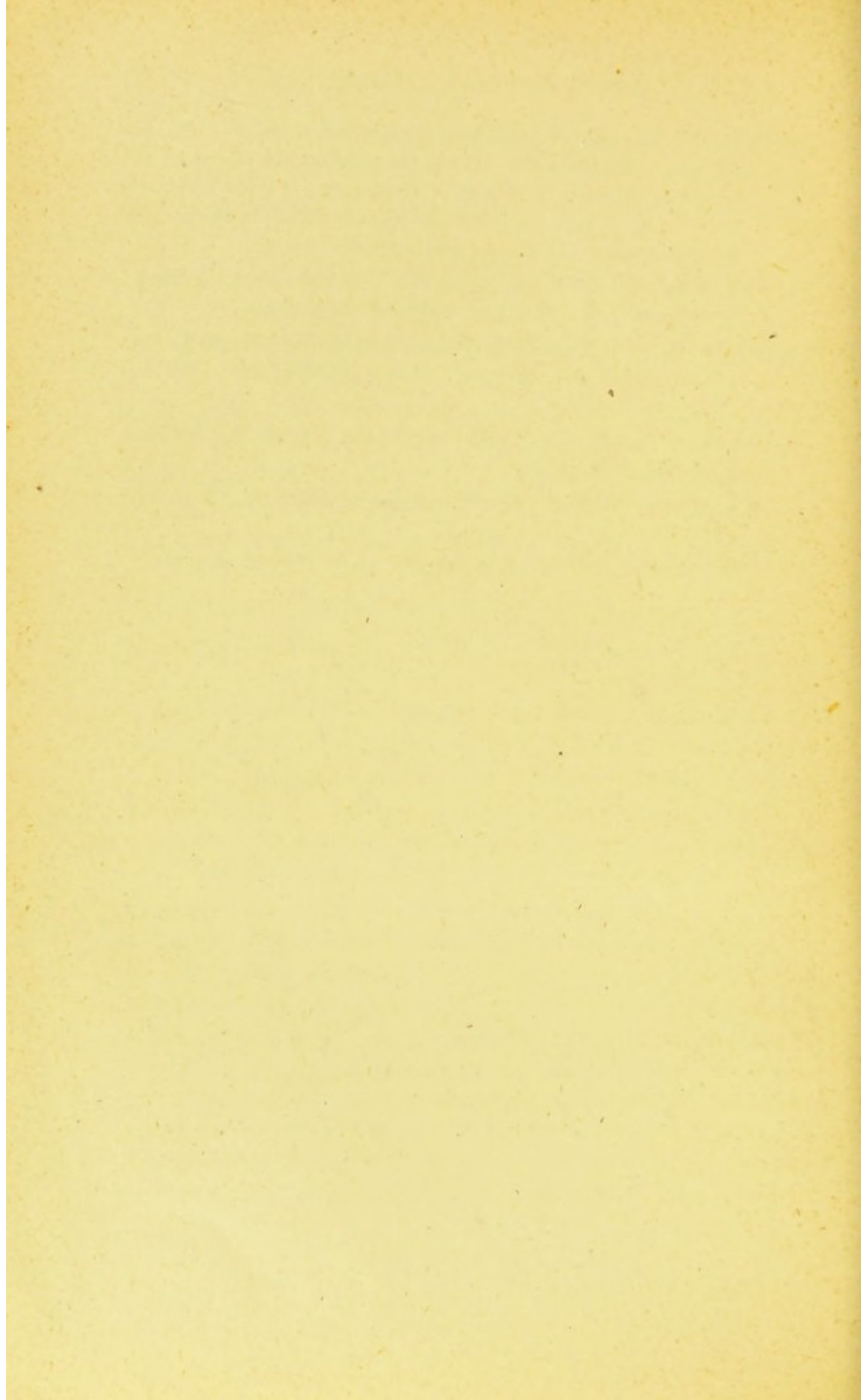
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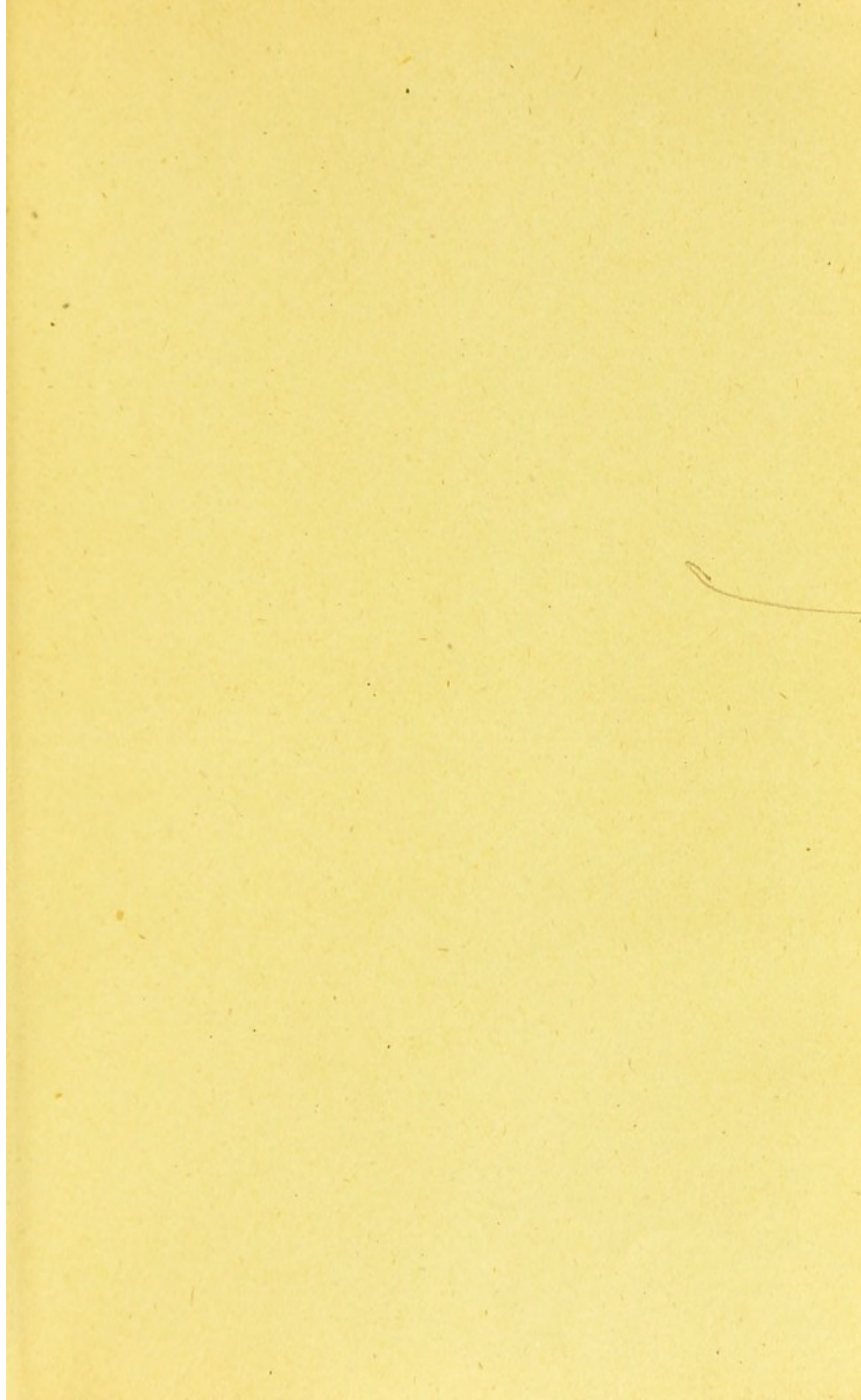
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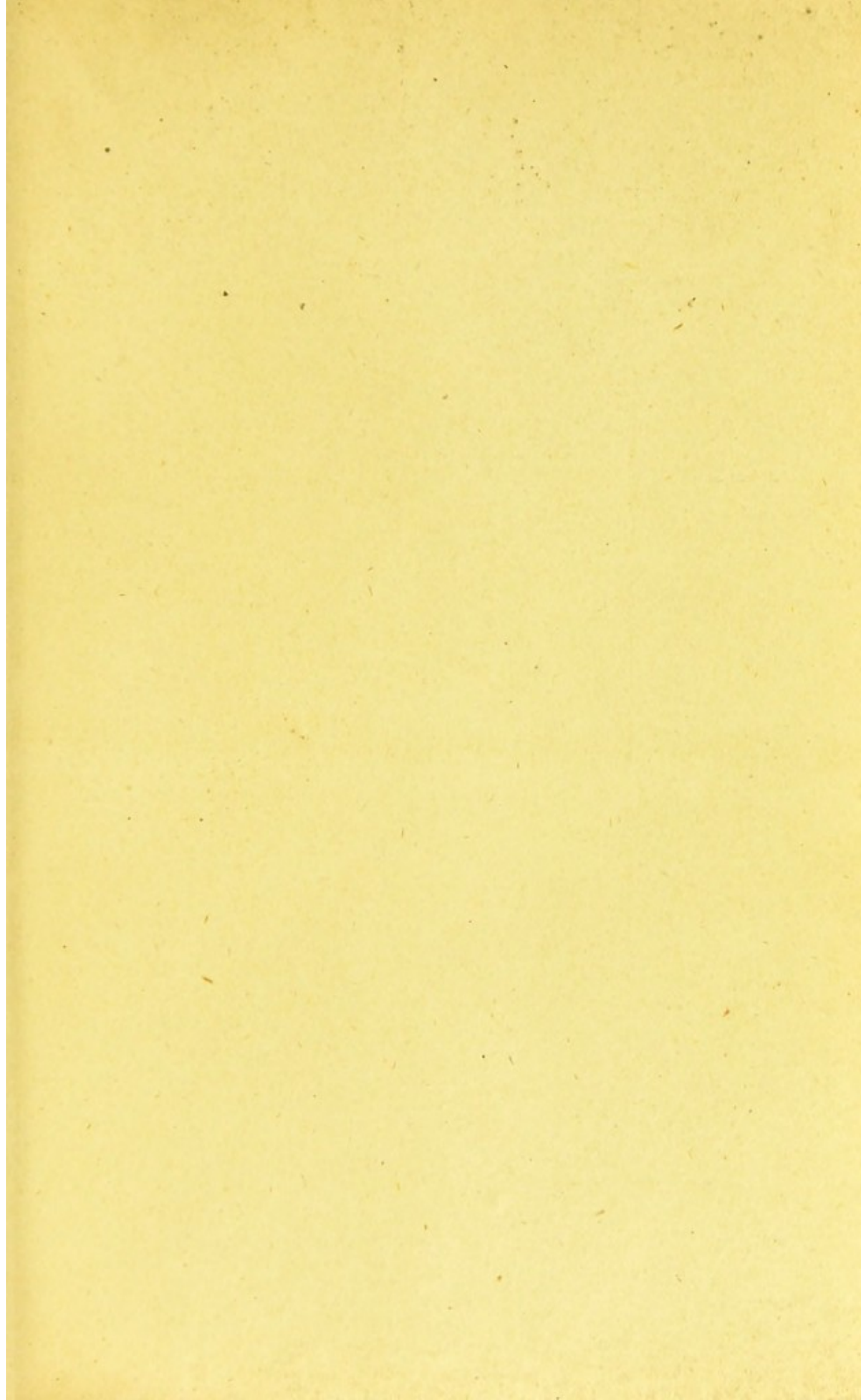
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