

GALEN  
*On the Properties of Foodstuffs*  
*(De alimentorum facultatibus)*

INTRODUCTION, TRANSLATION AND COMMENTARY BY

OWEN POWELL

*Department of Classics and Ancient History,  
The University of Queensland*

WITH A FOREWORD BY

JOHN WILKINS

*University of Exeter*



**CAMBRIDGE**  
UNIVERSITY PRESS

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE  
The Pitt Building, Trumpington Street, Cambridge CB2 1RP, United Kingdom

CAMBRIDGE UNIVERSITY PRESS

The Edinburgh Building, Cambridge CB2 2RU, UK  
40 West 20th Street, New York, NY 10011-4211, USA  
477 Williamstown Road, Port Melbourne, VIC 3207, Australia  
Ruiz de Alarcón 13, 28014 Madrid, Spain  
Dock House, The Waterfront, Cape Town 8001, South Africa

<http://www.cambridge.org>

© Cambridge University Press 2003

This book is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without  
the written permission of Cambridge University Press.

First published 2003

Printed in the United Kingdom at the University Press, Cambridge

*Typeface* Baskerville Monotype 11/12.5 pt    *System* L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> [TB]

*A catalogue record for this book is available from the British Library*

*Library of Congress cataloguing in publication data*

ISBN 0 521 81242 9 hardback

## *Contents*

<i>Foreword by John Wilkins</i>	<i>page</i> ix
<i>Preface</i>	xxiii
<i>Acknowledgements</i>	xxvi
Introduction	I
Galen's medical and scientific terminology	20
Translation	29
Commentary	153
Appendix I List of plants	186
Appendix II List of fishes	190
<i>Ancient sources</i>	192
<i>References</i>	195
<i>Index</i>	199

## *Translation*

### BOOK I

¶ Many of the finest physicians have written about the properties of K. vi  
foods, taking the subject very seriously since it is about the most valuable 453  
of any in medicine. For while we do not invariably make use of other  
resources, life without food is impossible, be we well or ill. So it is un-  
derstandable that most of the best physicians have been concerned to 454  
examine its properties in some detail, some alleging that they had come  
to know them from experience alone, others wanting to employ theoret-  
ical argument\* as well, while still others considered this latter to be the  
most important.

Now, if in their writings about food they were in agreement about  
everything (as is the case with people who write about geometry and  
arithmetic), there would now be no need for me to take the trouble to  
write again about the same things in addition to so many such men.  
But since by holding differing views they have raised suspicions about  
one another (for they cannot all be speaking the truth!) we must become  
impartial judges and put what they have said to the test. For without  
demonstration\* it is wrong to put one's confidence in one more than the  
others.

Since the starting points for demonstrations are twofold in type (for  
every demonstration and confident position has its origin either in per-  
ception or in a clear mental concept) it is necessary for us also to use  
one or the other, or both, of these for the elucidation of the problem  
in question. But since judgements using reason are not equally easy  
for everyone, for one must be both naturally intelligent and trained 455  
from childhood in subjects which sharpen reasoning, it is better to start  
from experience, and especially because many physicians have declared  
that the properties of foodstuffs have been discovered by this means  
alone.

Now perhaps one might look down on the Empiricists, who have made it their task and pursuit to speak out vigorously against what has been discovered with the aid of reason. Nevertheless Diocles,\* though he was a Dogmatist, wrote as follows in the first book of his *Hygiene for Pleistarchus*:

Those who suppose that things with the same flavours, smells, warmth, or anything else of the sort have the same properties are in error. For one can point to many dissimilar effects resulting from things that are similar in this way. Neither should one assume that every aperient or diuretic or whatever has any other property is as it is because it is warm or cold or salty; since not every sweet, bitter or salty thing, or anything else like this, has the same properties. Instead, one should acknowledge that it is its nature as a whole that is the explanation of whatever usually results from each. For so might one least go wrong. Those who think that for each food they must give a cause why it is nutritious, laxative, diuretic or anything else like that seem to be unaware, first, that such information is not often necessary for their use; and second, that many things that exist in some way resemble in their nature certain principles, so that they do not admit of reasoning about cause. As well as this, people sometimes go wrong when, making assumptions about things that are unknown, disputed or untrustworthy, they believe that they are adequately stating the cause. One should therefore pay no heed to those who account for causes in this way, or to those who think it imperative to give an explanation for everything. One should rather believe what has been learnt from long experience and seek a cause of things that admit of one when, as a result of this, what is said will be better known or more credible. 456

This passage from Diocles is from one who believes that the properties of food are comprehended only from experience, and not from indication in respect of either mixtures or humours. But he did not mention that there is also another type of indication\* in respect of the parts of plants. I mean by 'indication in respect of the parts of plants' one by which, in addition to the others he employed, Mnesitheos\* shows that some properties exist in the roots of plants, but different ones in the stems; just as there are others in the leaves, fruit and seeds. Now everyone, even if poorly endowed intellectually, is aware that just as experience teaches many other things, so too it teaches about foods that are digestible and indigestible, wholesome and unwholesome, and laxative and constipating. However, they fall into great error by using experience in these same matters in the absence of distinguishing criteria, as I showed in *On the Properties of Simple Drugs* and the third book of *On Mixtures*; and really the errors are much the same in each case. This is why I do not choose to describe in detail here, as I did in those works, the distinguishing criteria\* by which, if one takes note of them, he will more certainly discover the properties; 457 458

since it is my custom to write once and for all about each subject, and not retail the same things about the same subjects in multiple treatises. Nor shall I now neglect what has been my usual practice, which is to use the principal criteria only so far as it is possible to combine conciseness with clarity to the greatest extent. I shall start with what is generally agreed, and has been correctly reported by Erasistratus,\* namely, that *melikrat*\* does not purge the stomach in every case nor do lentils check it; but that there are some people who, as well as experiencing neither effect, even encounter the opposite,\* inasmuch as while the stomach is checked after *melikrat* it is emptied by lentils. Also, he says that one finds people who digest beef more easily than they do rock fish.

I myself always enquired of such people (for I shall start with the latter) what sort of symptom occurs which shows them that rock fish are indigestible. Is there any heaviness in the stomach that feels like lead, 459 stone or clay pressing down? For this is how some people describe the sensation in this type of indigestion. Or does a gnawing feeling manifest itself in it; or flatulence; or a sense of distressing belching? Some say that in their own case the belching is rather greasy; others, that there is a gnawing feeling; and some, that both occur.

On carefully considering the physical evidence in these people I found in the stomach a great accumulation of yellow bile, relating to some ill-mixture or to a constitutional peculiarity. I say 'constitutional peculiarity' because in some people the bile flowing into the intestine from the liver goes back up to the stomach; and I mean that the mixture is defective when their innate heat\* is sharp, irritant or, as one might say, feverish. So it is likely that these people more easily concoct foods that are difficult to corrupt than they do those that are easily corrupted, since the foods that are easy to concoct are readily altered and corrupted whereas those that are difficult to concoct are altered with difficulty and are hard to corrupt. So these latter foods, whenever they are associated with great warmth, are concocted more than if they were to be in contact with a 460 stomach of moderate warmth. In terms of this argument, then, some people concoct beef more easily than they do rock fish.

In some people lentils disturb the stomach more than they restrain it, in accordance with the following theory. I have shown in my work *On the Properties of Simple Drugs* that just as among the medicaments we prepare some are compounded of opposing qualities and properties, in the same way not a few drugs that appear to be single are by nature compound. This sort of situation occurs with many foods. For not only lentils, but cabbage too, and of seafood almost all the so-called

‘pottery-skinned’ animals\* have natures which are compounded from opposing properties. For the actual solid component of each is slow to pass and astringent to the stomach; but the liquid part promotes its emptying. Precise demonstration of this occurs as a result of boiling, when the water in which each has been boiled empties the stomach, but the actual solid parts check it. In this regard you will hear some people say 461 that if, before other foods, you eat cabbage that has not been boiled too much, transferring it all at once from the kettle into a vessel holding oil and fish sauce,\* the stomach will be emptied. But some others prepare what is called ‘twice-boiled’ cabbage to check it.

The preparation of such cabbage is as follows: having first boiled it in water they remove all this water from the container, replacing it with more clean water in which they boil it a second time, so that if any liquid is left from the previous boiling it will all be got rid of. For with everything boiled in water it is the case that it partakes of the property of the water at the same time as it contributes its own property to the water. And since this is a regular occurrence with things that are boiled in broth, you can learn whether what is being boiled is a pulse, part of an animal or a vegetable. For what has been boiled shows by taste and smell the quality and property of the broth, and the broth shows the property of what has been boiled in it. You can test the truth of the whole proposition I am now presenting by boiling up lentils or cabbage or any of the marine animals I referred to, then seasoning the decoction with 462 oil, fish sauce and pepper, and giving it to anyone you like, to drink, just as with twice-boiled cabbage. For you will observe that the bowel moves after the drinkable portion, but is constipated after the solid part.

So it is no wonder that sometimes both colic and flatulence occur after foods of this sort when the solids are taken in their entirety, together with their own juices; for there is conflict between them, with the solid material restraining and retarding, but the fluid portion pressing for excretion. If the irritant is expelled, the symptom ceases. While it remains, the bowel inevitably experiences colic and flatulence, and eventually there is evacuation of these contending influences.

Again, since in some people their stomachs are ready for evacuation but in others they are dry and excrete with difficulty, each group has 463 symptoms following such foods according to its own particular nature, as if sometimes the stomach is reinforcing the property of the juice, and sometimes that of the solid material. For when there are two opposing influences, victory must go to one of the two and defeat to the other. This happens with certain conditions of the stomach which are not natural to it

but have arisen at a particular time. Sometimes there is an accumulation in it of phlegm, and at other times of bile. Of the phlegm itself, some is acid, some sweet and some is without any perceptible quality; and some is watery, some thick, some viscid and some is readily dispersible. Of the bile, some is yellow and some is pale, both admitting of great variation in degree; leaving aside the other biles\* that are manifested in already diseased bodies. So with each of the humours mentioned being readily disposed either to the evacuation or restraint of the stomach, when the solid parts of the above foods arrive there, complete with their specific juices, they reinforce humours with the same property as themselves, but counteract those with the opposite property. 464

It has been remarked previously that there are two classes of explanation why, in the case of the same foods, the contents of the stomach appear to be handled differently.\* And now, as well as the natural constitution and the fluid and solid parts of what is eaten, one has discovered a third. It will make no difference whether we refer to things eaten as 'eatables' or as 'nutriments'. In fact, so too do people call them 'food-stuffs' or 'comestibles' just as often as the former names, in the way that Hippocrates also wrote in the *Epidemics*:\* 'Comestibles and drinks need trial as to whether they persist for the same time...' And again elsewhere: 'labours, foods, drinks, sleep, sexual activity – all in moderation'. Now, as I always say, we should not concern ourselves with names, nor worry about which to use, since they are familiar to every Greek, but it is proper to strive to understand the matter.

It seems that these foods have a speedy or a slow passage either because of our fundamental nature, or because of the acquired disposition of the stomach, or because of the particular substance. I mean the particular substance of the things that are eaten and drunk, since some are liquid but some are dry, some are tenacious while others are easily broken up and dispersed, and some possess an intrinsic pungency but others acidity, bitterness, sweetness, saltiness, harshness or astringency; or some, aside from these, have pharmacological properties of the same group as the purgative drugs. For example, orach, blite, mallow and the round gourd, through being sticky and moist, pass more quickly than those that are not so, especially in people who walk about quietly after food, on moderately yielding ground. For food slips through more on being shaken up than if one is reclining motionless. 465

One could also put mulberries and sweet cherries in this class, as also the thick, sweet wines. Both melons and what are called apple-melons are good for evacuation because of their moistness and slipperiness, and 466



have a moderate cleansing power, the melons more so than the apple-melons, which you can confirm by rubbing a dirty part of the body; for they cleanse it of its dirt immediately. These also, you should know, are among the items that stimulate micturition.

Also amongst moist, watery substances are the so-called apricots, peaches and, in general, things that appear to have no pronounced quality of taste or smell, which, if the stomach is fit for emptying, pass easily; if not, they remain unconcocted\* and give it no assistance with this. For this sort of food material, being somehow midway between what restrains and what stimulates the stomach, inclines a little in one or other direction when it chances on a stomach that is either not very sluggish in emptying or is very strong in distribution. Of course, sometimes these foods also restrain it.

*Melikrat* also, in those individuals in whom it is first to be speedily distributed, not only does not impel the stomach [*gastêr*] towards emptying, but even brings about the distribution of foods that are mixed with it. But if it is not first speedily distributed, it provokes excretion like yellow 467 bile does, because it contains within itself something bitter and irritant. So foods and drink of such sort, merely by being irritant, stimulate bowel [*koilia*] evacuation.\*

It is clear that the substance of the intestines [*entera*] is also included in the statement. Certainly people use the terms ‘pot-bellied’ [*progastôr*] and ‘large-gutted’ [*megalokoilos*] in this way. Certain foods that are purgative of the gut [*gastêr*] have pharmacological properties mixed within themselves, like that in scammony, gourds, hellebore and the like. The nature of such things is a mix of food and drug, just as if you yourself were to throw a small quantity of scammony juice into the liquid of a barley water.\* For while in this way it is not appreciated by the senses, it will not escape notice as regards its activity, but will obviously be purgative. Some think that this is what was stated by Hippocrates – ‘purging in foods is best...’\* – but others thought one should not take it in this way alone; rather, it seemed to them that the statement can also have been made 468 of those foods that have neither any nutritive nor any cleansing property for the animal.

In fact they also say that these often act not only as foods but also 468 as drugs, clearly warming, cooling, drying and moistening us; so that whenever one of them is not acting upon the human body but is only nourishing it, under these circumstances it will not be defined as a drug. Now foods like these are very few in number; but, whatever they may be, they only have the precise definition of a food when there is no

qualitative alteration\* of the body of the consumer. For what has been warmed, cooled, dried or moistened has been altered qualitatively; but what has taken from food a mass of substance like that which has been dispersed, has benefited from it as from food alone.

Accordingly, things that are average in mixture without any predominating quality are food only, and not drugs, neither moving the bowels 469 nor checking them; neither strengthening nor relaxing the *stomachos*; just as they are neither sudorific, nor diuretic, nor productive of any other bodily disposition as regards warmth, coldness, dryness and moistness. But in all respects they maintain the body of the animal being nourished just as it was when it received them. But here there is a certain very useful point of distinction, and this was not described by Diocles, just as neither was any of the others I have dealt with so far.

For if a human body were precisely average in mixture, it would be maintained in its existing condition by food that is average in mixture. But if it were either warmer or colder, or drier or moister, one would do harm by giving this body food and drink that is average in mixture. For every such body needs to be altered in the opposite direction to the same extent that it has departed from the precisely average condition; and this will occur with foods that are the opposite of the existing ill-mixture. In each opposing situation the opposites stand the same distance from the mean. As, for example, if the body departed by three measures from 470 the well-mixed and average condition to a warmer one, it would be necessary for the food also to shift by the same amount from the well-mixed condition to the colder state. And if the body moved to a moister state to the extent of four measures, the food should by the same degree be drier than what is well proportioned.

Again, in this regard, one can find many people making the most contradictory statements about the same foods. At any rate, recently a certain two persons were debating with one another, the one declaring that honey is healthy, the other that it caused illness. Each made his judgement according to how he himself was affected by it, not considering beyond this, that all men do not have a single mixture from the beginning or, if they did, that they do not keep it unchanged in old age; just as they do not do so during seasonal or geographical changes – for the moment ignoring the fact that by their customs and ways of life they also change the innate dispositions of their bodies. At any rate, to come straight to the point, one of those men who were at odds with each other about honey was older, more mucous by nature and lazy in his lifestyle and all other activities (not least in regard to exercise before bathing). Consequently

honey was of benefit to him. But the other was by nature bilious, thirty 471  
years of age and endured many hardships in his daily activities. So it was  
likely that in his case the honey had been quickly converted to bile and  
so was more harmful.

I myself also knew someone who complained about the region at the  
mouth of the stomach, when I calculated from what he said that phlegm  
had accumulated in it.\* I recommended that leeks and beets be taken  
with mustard, and when they had cut the phlegm, the stomach emptied  
better and he was relieved of all symptoms. On the other hand again,  
when he once suffered from indigestion and gnawing abdominal pains  
after bitter foods, not only was he not helped with the gnawing by taking  
beet and mustard, he was actually made worse. And then, wondering  
how he was so badly affected by what previously had given great benefit,  
he approached me to learn the reason.

Now it is reasonable enough in medicine for laymen to be mistaken 472  
about such matters. But one would not excuse physicians who have left  
undefined many very useful propositions. For it is not proper simply to  
say that rock fish are well-concocted by most people but that some are  
found who concoct beef more easily. Rather, they should define each  
group. Just as it is not proper to speak about honey in a general way,  
but rather with the additional feature that it is beneficial or harmful in  
certain age groups, natures, seasons, regions and lifestyles. For example,  
that it is most adverse in those who are dry and warm, but very beneficial  
in those who are moist and cool – whether they are like this in mixture  
because of age, nature, region, season or lifestyle.

So that in relation to the present enquiry it seemed most necessary  
to examine the mixtures both of men and of foodstuffs. How many of  
these there are in men and how one should diagnose them has been told  
in my treatise *On Mixtures*; just as with drugs, in that work\* which deals 473  
with their properties. But in the present study it might be timely to speak  
of the mixtures of foods, as has been written in the book *On Regimen*,  
the work of Hippocrates according to some, but according to others the  
work of Philistion, Ariston, Euryphon or Philetas, all men of old.\* In  
some copies its beginning is as follows:

One must know the property of every food and drink, both natural and acquired  
through art, thus . . .

but in others:

One must diagnose the situation and nature of each region thus . . .

Now when this book is taken on its own it is entitled *On Regimen*,\* being the second part of a whole which is divided into three. But when what was put together from the three parts is found as an undivided entity, it is entitled *On the Nature of Man and Regimen*. Now one might perhaps consider the second book, in which there is discussion about food, worthy of Hippocrates; the first is very far from his thought. But this is by the way. Whichever of the men mentioned it belongs to, it appears to bring regimen back into the general enquiry concerning foods. 474

For he who knows that barley is cold and moist by nature, and also understands how to recognize the mixtures of bodies, both those that are innate and those that occur in an acquired condition, will use barley for food appropriately; not only in the case of healthy bodies but also in those that are diseased; and whoever understands their mixture might also happily employ barley meal in poultices.

Not only should one recognize the most important and primary mixture of each foodstuff but also, as was explained in *On Drugs*, the mixtures which arise from the primary ones; not least of which are many (if not indeed all) of those related to flavours, and also some related to smells. For as a result of each having been mixed in some way from so much warm, so much cold, and so much dry and moist, one of them seems sweet, another sharp, or salty, or sour, or harsh or bitter. 'Saline' means nothing other than 'salty', and the same characteristic is revealed by both words; and the common class of 'sour' and 'harsh' is called 'astringent'. I have spoken at very great length about all flavours in the fourth book of *On the Properties of Simple Drugs* and whoever intends to follow what is now being said must assuredly have read that work in advance, so that I am not forced to repeat in this one the same things about them. 475

As I stated a little earlier, while some foods exhibit no noteworthy quality of smell or taste (ones which are in fact the sort people refer to as insipid or watery), others have very obvious astringency, or innate sweetness, or bitterness; just as others also appear rather salty, and some partake of a distinct pungency. So it is clear that foods like these have the same property as those drugs which they resemble in flavour. In *On Drugs* I have given an explanation why some astringent ones do not produce the same effects as others; for instance, bitter aloes, burnt copper, bluestone, flower of copper, copper scale and copper ore.\* For in each case, as a result of some other things having been mixed with their astringent property and substance, they undergo change in their particular functions; just as if you yourself were to mix scammony with quince, as of course we sometimes do when we carve out the parts around the seed of the quince, 476

fill the hollowed-out part with scammony, plaster it with dough and bake it, and then offer it as food. For what has been prepared in this way evacuates the bowel without disturbing the *stomachos* since the cathartic property in it that is derived from the scammony predominates, while the familiar property of the quince persists. For it would not otherwise seem both pleasant *and* astringent, and suitable for the *stomachos*.

So it is that some foods have some slight property mixed within themselves, whether purgative, or naturally having some other action. In their case one should not entertain doubts about the properties associated with their flavours on the grounds that the effects are not those they have naturally. For anything that has an astringent quality, to the extent that it exists on its own, contracts, constricts and cools the substances associated with it. But sometimes the same substance can have parts of itself that are warming and parts that are cooling, as I pointed out in *On the Properties of Simple Drugs*, since nature has mixed them in this way, just as sometimes some physicians mix pyrethrum or pepper with one of the cooling agents. 477

As I said, this has been gone through very fully in my work *On Drugs*, and is most valuable for what is being taught now. In fact the various methods of preparation of each foodstuff are discovered by those who have already understood these things. I myself sometimes administer a beet and lentil dish, and before me Herakleides of Tarentum\* frequently gave it to many people, not only to those in excellent health but also to those with some complaint. First we put in plenty of beets, and next either a small amount of salt or sweet fish sauce,\* for in this way it is more aperient. If, however, when you have pounded the lentils and boiled them twice, pouring off the first water, you then mix in a little salt or fish sauce and add a small quantity of something costive (to the extent that it does not upset the taste), you will make a drug, and at the same time a food, that is most useful for many who are troubled by chronic diarrhoea. I said 'for many', being careful not to say 'for all', because here too there is need for distinguishing criteria by which the dispositions of those who suffer from chronic diarrhoea will be identified. 478

Generally speaking, one cannot properly test anything empirically without first accurately working out, by reasoning, the disposition to which he is applying what is being tested, be it food, drink or drug. For the knowledge of such dispositions\* is the stuff of remedies, not the knowledge of the remedies themselves; but since, without knowing precisely the properties of the materials we use, it is impossible to help those in need of them, it is necessary here to discuss the properties in 479

foodstuffs, as it was elsewhere to discuss those in drugs. Knowledge of them is achieved with difficulty by a defining test over a long time, and from the nature of the odours and flavours which the foods being tested appear to have; and as well, from the consistency they have acquired in respect of viscosity, friability or loose texture; and solidity, lightness or heaviness. All these contribute to their elucidation so that if, on arrival in a foreign country, you were to see some food you have never seen before, you would have a significant starting point towards knowledge of its property. What Mnesitheos wrote about roots, stems, leaves, fruits and seeds does not admit of a very secure distinction if you are differentiating them by a defining test in a manner that will become clear from what follows. For I have determined to go through each of these foods separately, in detail, even if the discussion is going to take longer. At any rate, I shall be able to give later, in another shorter work, a synopsis that will be valuable for those who have learned the art. For only extensive practice and training bring craftsmen to perfection. This is why I think that the majority are correct who say that the best instruction is through personal contact, and that it is impossible for anyone to become either a helmsman or an expert in any other craft from a book. These are reminders for those who have previously studied and understood, not complete instruction for the ignorant. Just the same, if any of the latter who lack instructors are willing to attend carefully to what has been written clearly and in detail as I am doing, they will profit greatly, especially if they do not hesitate to read it over and over again. 480

## 2 On the naked wheats\*

Reasonably enough, most physicians seem to me to have commenced the instruction in question with the wheats, since this grain has very many uses both for Greeks and for most foreigners. The most nutritious of them are the dense ones with their whole substance compacted, so that it is difficult to split them by biting. They give bodies the most nutriment from the smallest bulk, just as their opposites, which are easily broken up by biting and after biting appear loose-textured and porous, produce little nutriment from great bulk. If you care to weigh an equal bulk of each you will find the dense ones by far the heavier. They are also more yellow in colour than the loose-textured ones. But one should test their nature, not simply by examining the external appearance, but by dividing them and breaking them up as I said. For although many from the outside appear yellowish and compact, inside they are seen to be 481

loose-textured, porous and white. These latter have the most bran and, when milled, if one sifts out the very fine meal and makes what are called bran loaves from the remainder, trial will show that while they are poorly nutritive they produce much residue in the stomach and consequently 482 it is passed easily. At the same time, because the bran has a cleansing property, elimination of the residues, as you would expect, takes place quickly since the bowel is stimulated to excretion.

The loaves that are the opposite of these are extremely pure, bringing the greatest weight to the smallest bulk, but of all the breads they pass through the most slowly. Indeed you will also observe that their dough is quite tenacious, since, when it is drawn out to the greatest extent, it is not torn apart, which is characteristic of a tenacious substance. And so these naturally need more leaven and require more thorough kneading, and should not be baked soon after leavening and kneading.\* But with bran loaves a small amount of leaven, light kneading and a short interval are sufficient. So too, while the pure loaves need a longer period of actual baking, the bran loaves need a shorter one. Between the most pure and the least pure is a wide range where there is more or less purity, some called, and in truth being, pure, and others impure. 483

As well, there is a precisely halfway form of these loaves which goes by the name of wholemeal. The older physicians called them unbolted. Now it is clear that these are from meal in unsifted form, when the bran-like material has not been separated from the pure flour. That is why they called them wholemeal, since the whole wheat itself is made into loaves, and unbolted, because when they are being prepared the meal is brought together without being sifted. But even among these themselves which seem to have been set precisely at the mid-point of the range, between the breads derived from bran and those of extreme purity, there is marked variation according to the nature of the wheat. For breads from the compact, heavy wheats are better; those from the loose-grained and lighter wheats are poorer.

Among the Romans, as also among just about everybody else over whom they rule, the purest bread is called *silignis*, and the next is called 484 *semidalis*. While *semidalis* is an ancient Greek name, *silignis* is not Greek but I cannot give it any other name. Now *silignis* is the most nourishing of them; next is *semidalis*; and the one in the middle, wholemeal, is third. Fourth is the group from unwinnowed grain, of which the bran loaf is the worst. It is indeed the least nourishing, and of all the breads it moves the bowels most.

The best-concocted breads are those that have been most leavened and very well kneaded, and baked in an oven with moderate heat. Greater heat scorches at once when first applied, and produces a pottery-like appearance on the outside; and the loaf turns out to be of poor quality on two counts, with its inside raw and inadequately baked, and its crust overbaked, dry and like pottery. With heat that is less than moderate the bread is not well baked, but the whole loaf is left rather raw, the inside most of all. Those that are baked uniformly throughout in moderate heat for a longer time are also very well concocted in the stomach and are most suited to the sequence of activities that occurs following concoction. Clearly, the worst breads are those to which none of the above applies. 485

Now that I have distinguished the extremes among them in both excellence and badness, it is no longer difficult for anyone on his own, without assistance from me, to grasp that some breads are close either to the best or to the worst extreme, that some are further away; and that others, as I said, are placed midway between both extremes. It is just as I was saying earlier about honey, namely that one should not say simply that it is good or bad for health, but rather that it is good for a phlegmatic nature, one that is moister or colder than a well-mixed nature, even if it is only colder without much moistness, or moister without much coldness; and that it is unsuited for warm mixtures, and even more so for warm, dry ones. So among breads too, while one that has not been very well baked nor has much leaven is suitable for an athlete, and one that has been very well baked in the oven and has much leaven is suitable for an ordinary individual or an old person, one which is absolutely unleavened is not fit for anybody. But if one also adds cheese to the bread, as holiday-makers among our country folk usually prepare it (which they themselves call unleavened), there is certain harm for everybody, even if some of them are very strong in body constitution, such as those who are by nature the best reapers and ditch-diggers. For these people are observed to concoct unleavened breads better than the strongest athletes (as they also do beef and the meat of he-goats). What further need is there to mention sheep and female goats as well as these? 486

In Alexandria they eat donkey meat as well, and there are also some people who eat camel. For while custom contributes to their concoction, of no less importance is the small amount taken and the depletion of the body\* as a whole that necessarily accompanies those who toil throughout



the day at their proper activities. For the depleted flesh snatches up from the stomach not only half-concocted, but even, when they work after a meal, sometimes absolutely unconcocted chyme. This is why these people later suffer very troublesome illnesses and die before they reach old age. Ignorant of this, most people who see them eating and concocting what none of us can tackle and concoct congratulate them on their bodily strength. Also, since very deep sleep occurs in those who undertake much hard labour, and this helps them with concoction to a greater degree, they are consequently less injured by harmful foods. But if you were to force them to stay awake for more nights in succession they would immediately become ill. So these people have but this one advantage in the concoction of harmful foods. 487

Athletes take very wholesome foods, but the heavyweights among them, especially, take foods that are fatty and glutinous. People refer in this way especially to wrestlers, *pankration* fighters\* and boxers. Since their whole preparation is with a view to contests in which sometimes they must wrestle, or fight in *pankration*, all day long, for this reason they also need food which is both difficult to corrupt and not easily dispersed. The nutriment from thick, glutinous humours\* is like this, especially the sort from pork and from breads prepared as I have described, which professional athletes consume exclusively. If the ordinary untrained individual keeps using food like this he will very quickly come down with a plethoric disorder; just as also, if a man in training were to subsist on vegetables and barley-water, he would very soon be in a sorry plight and wear out his whole body. The humour from breads like those which I said the athletes use, if one of us ordinary people eats them, is thick and cold like that which we usually refer to, specifically, as 'crude'. Now it is also the case that phlegm is crude and cold, but not thick since it contains a good deal of moisture as well as flatulence-producing wind. That specifically referred to as crude is like this, and appears like that which sometimes settles out in urine and resembles pus. But while pus is foul-smelling and tenacious, the crude humour resembles it only in consistency and colour, being neither foul-smelling nor tenacious. Certainly it does not settle in the urine in febrile patients only, due to the quantity of the crude humours I spoke of, but also in healthy persons who are engaged in heavy work and who take foods that are hard and difficult to concoct. 488

There will be later discussion regarding other foods, but as to the breads,\* since we set out to discuss them first, let us now also speak about these in addition to what has already been said. The best of them 489

are the *kribanítai*, when baked (and previously prepared for baking) in the manner that I have described. Those baked in an *ipnos* are second to these, having had the same sort of preparation. But since they are not baked right through like those in the *kribanos*, they are inferior to them. The ones baked on the coals, whether on the hot ashes or by using the tiling of the hearth like a *kribanos*, are all unsatisfactory through being unevenly cooked; the crust is overdone but the inside is underdone. And from having been baked covered in ash, the latter adds something 490 unpleasant to the so-called ‘ash-hidden’ loaves. So that, of all the breads, these last are liable to be the worst from the point of view of style of baking, even if they use the same ingredients. For in every instance of the topic under consideration you should take note that what are being compared with one another have been altered in respect of those features only,\* since if you were to compare things that differ in many ways they would have, taken together, everything that has been described in each of them severally.

Now everything to do with the differences between breads has been dealt with sufficiently.

### 3 On pastries

Now might be the time to speak of the other sweetmeats that they make from wheaten flour. What are called girdle-cakes [*tagénitai*] by the Athenians but griddle-cakes [*téganítai*] by us,\* the Asiatic Greeks, are prepared with olive oil alone. The oil is placed in a frying pan that is put on a smokeless fire, and when it has become hot the wheaten flour, soaked in a large amount of water, is poured into it. When cooked in the oil, it rapidly sets and thickens, resembling soft cheese solidifying in wicker 491 baskets. At this point those making it turn it to bring the upper surface underneath, in contact with the pan, bringing what was previously underneath, which has been sufficiently cooked, to the top; when the under part is now set, they turn it again, perhaps two or three times, until it seems to them that the whole has been cooked evenly.

It is obvious that this has thick juice, restrains the stomach and gives rise to crude humours.\* This is why some mix honey with it, and there are those who also mix in sea salt. This, then, would be a class (or species, or however you want to refer to it) of flat-cake, just as country folk and very poor town-dwellers make many other such flat-cakes from whatever is to hand. For that reason those unleavened sweetmeats which they bake 492 in a *kribanos* and immediately remove and put into warm honey, so that

they are saturated with it, are also a type of flat-cake; and so too are all such items made with honey.

#### 4 About cakes

There are two sorts of cake: the better sort that they call ‘pour-cakes’, and the inferior ‘broad-cakes’. Everything made up of these and *semidalis* is slow to pass, produces a thick humour which is obstructive of the food passages in the liver, causes enlargement of the sickly spleen and produces kidney-stones; but if they are concocted and properly turned into blood, they are quite nutritious. Things prepared with honey are of mixed property, since the honey itself has fine juice that thins whatever it is associated with.

So it is understandable that those cakes that had received more honey in their preparation, and which had been baked for a longer time, are less slow to pass and give rise to a humour that is a mix of thick and thin, and in healthy people are better for liver, kidneys and spleen than those that have been prepared without honey. But in people with incipient obstructions, 493 whether due to inflammation or induration, they are just as harmful; sometimes, rather, they are even more harmful, most especially all those in which the flour is somewhat sticky. For the humour from them is not only held back and prevented from progressing due to its thickness, but also, being plastered inside the narrow extremities of the vessels, produces a stubborn blockage. The viscus damaged in this way produces in patients a certain heavy sensation, which requires the assistance of thinning foods and drink. This has been discussed elsewhere in my *On the Thinning Diet*.\*

Nothing prepared in this way harms the chest or lung. But later I shall discuss the foods that generate thick, sticky humour. The present account requires that you keep in mind the other things I have gone through up to this point, and especially everything to do with the property of breads, since we use them continually. And there is no harm in recalling, in summary, what has been said about them. 494

So then, the healthiest bread, in a man who is neither young nor in training, is that with the most leaven and the most salt, which has been kneaded by the baker to the greatest extent until it has been prepared for baking, and has been baked in a moderately hot pan in the way I spoke of previously. Let taste be your criterion of ‘most’ in regard to the leaven and salt; for in a stronger mixture of these the unpleasant taste indicates that it is unhealthy. So it is better to increase the amount of them to just short of when taste recognizes unpleasantness from the mixture.

### 5 On light bread\*

Those who want to make light bread find that while the food is less nourishing it has, to the greatest possible extent, avoided harm due to obstruction. For this bread is the least thick and sticky, since it has become more airy rather than more earthy. Its lightness is revealed by its weight, and by the fact that it does not sink in water; rather, it floats like a cork.

You should know that many of our country people bake a mixture of wheaten flour and milk, and this food belongs to the adhesive group. 495 Even though all such foods are wholesome and nutritious, because of this they hurt those who use them continually, producing obstructions in the liver and generating kidney-stones. Since the crude humour is added to the glutinous component, whenever the kidney passages in some people are naturally very narrow, by delaying the very thick and very glutinous humour here, it is likely to produce stone, like that formed in the vessels in which we heat water and that which is coated around the stones in many natural hot springs. The mixture of the kidneys themselves also contributes particularly to this, when the warm in them is of the fiery, sharp sort. The stones that are developed in joint conditions are also of this type. For it is always the case that everything superfluous in the body runs to the weakest sites\* and produces effects in them according to its own nature. I will return to this in the discussion on milk and all its uses, 496 as also about the thickening foods, since there are certain other foods with this type of property.

### 6 On groats

Groats belong to the wheat family.\* They have juice that is quite nourishing and tenacious if, when they have been cooked in water alone, they are taken with honeyed wine,\* or with sweet or even astringent wine (the critical time for use is specific for each), and if salt and oil have been stirred in. Sometimes, too, vinegar is added to it. Physicians say that groats prepared in this way are seasoning à la ptisane.\* But some say that the patient is nourished by ptisane made from groats; and some of the old physicians, like Diocles and Phylotimos, call groats prepared in this way 'wheaten ptisane'. This is why the name is rarely used amongst the older physicians, as also that of spring wheat. They refer to them by the common name of 'wheat'. In Hippocrates' *Regimen* it was stated that breads made from groats, while very nutritious, are less aperient. It was also said that *semidalis* and boiled groats are strong and nutritious.\*

So it is well to be wary about much use of them for those people in whom the liver is easily obstructed or the kidneys prone to the development of stones. 497

One should particularly pay attention to gruel made from what are called 'washed' groats. For this is their liquor when they have been mixed with water, but, although it needs lengthy boiling, it tricks those preparing it into believing that it has been sufficiently cooked, and does considerable harm to sick people, the very ones for whom they are preparing it. For because it is viscid it quickly becomes firm and thickened. Accordingly cooks, when they have mixed the groats with a good deal of water, should boil them on the coals for a longer period, stirring in dill, until they are nicely cooked, and at that time also put in salt. If you also have mixed in olive oil right at the beginning, you will do no harm.

But take this as a side-issue with application to therapeutics and not to our present concern. For healthy people, whenever they need gruel because of severe irritation of the stomach, or the passage of much biliary material, or anything of that sort, once you have boiled the groats to the greatest extent so that they are softened, and have then stirred them so that they come to resemble the strained liquor of ptisane, give it then as a draught. The seasoning is the same as with washed groats. 498

## 7 On wheat boiled in water

If I had not once eaten wheat boiled in this way, I should not have expected food from it to be of use to any one. Not even in famine would anybody come to this sort of use, for if wheat is in good supply one can make bread from it. At dinner people eat boiled and roasted chickpeas and other seeds for want of so-called desserts, preparing them in the same fashion, but nobody eats boiled wheat in this way. This is why I should not have expected anyone to eat boiled wheat.

But once when walking in the country not far from the city, with two lads of my own age, I myself actually came upon some rustics who had had their meal and whose womenfolk were about to make bread (for they were short of it). One of them put the wheat into the pot all at once and boiled it. Then they seasoned it with a moderate amount of salt and asked us to eat it. Reasonably enough, since we had been walking and were famished, we set to with a will. We ate it with gusto, and felt a heaviness in the stomach, as though clay seemed to be pressing upon it. Throughout the next day we had no appetite because of indigestion, so that we could eat nothing, were full of wind and suffered from headaches 499

and blurred vision. For there was not even any bowel action, which is the only remedy for indigestion. I therefore asked the rustics whether they themselves also ever ate boiled wheat, and how they were affected. They said that they had often eaten it under the same necessity that we had experienced, and that wheat prepared in this way was a heavy food, difficult to concoct. It was obvious that this could be worked out even by someone who had not tried it. For as I said earlier, where its flour, when eaten, is not easy to concoct unless it has been thoroughly worked up with salt and leaven, and mixing and kneading, and baking in an oven, how could one not realize that wheat which is not well worked up is very indigestible? Certainly wheat eaten this way has great potential if it has been concocted, nourishing the body very much and imparting notable strength to those taking it. 500

### 8 On starch

This, which has the property of being emollient to roughened parts, is prepared from wheat. This action is common to all substances that, while dry in composition, have neither astringency nor bitterness nor any other manifest property. People call them, reasonably enough, neutral in quality, since this is how they are as regards sensation. Among moist substances water is like this. In property, starch is very like the light breads, providing less nutriment for the body than they do, and not being warming; just as they are not, while other breads are warming. For one ought not to compare it with wheat boiled in water, which is clearly warming and, if concocted, powerfully nourishing, although it is difficult to concoct, as I have said.

### 9 On barley

501

This seed also is of great service to men although it has not the same potential as wheat.\* For while the latter is obviously warming, barley is not only far from warming (just as some foods are betwixt warming and cooling, such as starch and light bread) but it actually seems to be cooling in every way it is used, whether one has prepared bread from it or cooked a ptisane or made barley groats. And it is a far cry from the nature of wheat as regards the form of the juices which each produces. For wheat produces a thick, sticky juice but barley gives rise to one that is thin and cleansing. Barley never warms the body in any sort of preparation, but

when prepared in a variety of ways it is either moistening or drying. 502  
 For groats from roasted barley are manifestly drying; but a ptisane is moistening when it has been made properly, that is to say, when it has swollen to the greatest extent by boiling, and then has been made into a liquor by long and gentle simmering. At that time, when it is fully swollen, vinegar is mixed with it. When it has been cooked to a nicety, one should add fine salt just before eating. And if right at the start you were to add oil, you would do the boiling no harm. But you should not mix in anything else except, at the beginning, a small amount of leek and dill.

It is my observation that the ptisane is very badly prepared by all cooks. For they break it up by grinding it in the mortar while raw, rather than boiling it over a fire. And some also add starch so that the ptisane seems to have been sufficiently converted to liquor by boiling. So, naturally, this sort of ptisane is flatulent and excessively difficult to concoct.

But it is right to add what I said in the case of good preparation. Having first soaked the uncooked ptisane in water for a short time and then put it into a mortar, you should rub it with your hands while holding something rough, like what is called broom, from which they plait shoes for draught animals. Let the extent of the rubbing be such that it clears away the adherent husk. For when barley is winnowed, the surrounding thin coat is not all cleaned away. Hence it is first soaked and then rubbed in the mortar. But if all the chaff-like material does not fall off, the cooked 503 ptisane is more cleansing but comes to no other harm.

The worst preparation of ptisane is when the cooks have ground the uncooked barley in a mortar with water then, when they have boiled it for a short time, they add a little of what is called must, and boiled-down wine. Some also put honey and cumin in with this, making a potion rather than a ptisane. But the well-made ptisane provides what Hippocrates said was useful for healthy and ailing men alike. 'For', he said, 'its glutinous quality is smooth, uniform and soothing; and slippery, moderately damp, thirst-quenching and easily excreted (if there were also any need for this), and with neither astringency nor bad palpitations; nor does it swell in the stomach, since it has swollen during the boiling and has increased in bulk to the greatest possible extent.'\*

This is all that needed to be said about the property of ptisane in the 504 present treatise, which is not to do with therapeutics, but with explaining the properties of foodstuffs alone. But during the course of the work some of their therapeutic uses are also being taught.