The Problemata’s Medical Books: Structural and Methodological Aspects

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One of the most intriguing features of the pseudo-Aristotelian collection of Problemata concerns the prominence of medical information in its content: medical topics are mostly concentrated in two extensive groups of books, namely, 1-11, and 31-38, which are placed at the head and conclusion of the collection, respectively. This arrangement possibly hints at a deliberate plan to make the medical enquiries distinctive, although the reason for this is never openly proclaimed. On the other hand, although it is clear that the authors of the Problemata took care to organise medical problems into books according to topic (ranging from the origins of health and disease, to investigations concerning therapy, pharmacology, physiology and anatomy), it is harder to determine the relationship of the individual medical books, as well as of the individual problems that comprise each medical book, to one another. Indeed, more often than not the medical books, far from offering an orderly exposition of their respective topics, give the impression of disjointed assemblies of heterogeneous causal enquiries.

My main concern in this chapter will be to draw attention to some key elements of structure and method that are common across the Problemata’s medical books. That is not to

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2Flashar was the first to note this ring-like schema (1962, 318-20).
say that I wish to underplay the differences between them: like the Problemata as a whole, the medical books are products of progressive accumulation, rely on different sources, and reflect the approaches of different scientists. What I hope to clarify however are some important questions pertaining to the criteria that dictate the selection and organisation of medical knowledge within the work, and the broader intellectual goals served by its exploration of medical topics. It is hoped besides that the answers will, at least in part, help shed light on the Problemata’s internal economy as a text which is all too often dismissed as a mindless compilation. The necessity of such a line of study is felt all the more strongly if we consider the work’s rich afterlife: in subsequent centuries it spurred the writing of other collections of medical and naturalist problems, thus ensuring the transmission and dissemination of a key segment of ancient scientific thought.

1. The Cohesion of the Problemata’s Medical Books: Topics and Macrostructure

The Problemata’s choice and distribution of medical topics is unique within the extant corpus of Greek and Latin medical and scientific writing, and does not correspond to any known divisions of the medical art. Only the very first book explicitly associates itself with medicine, through its title: ὅσα ἰατρικά (“enquiries pertaining to medicine”). The heading is apposite, as the enquiries focus on the causes of health and disease (problems 1-2, 5, 7) and the connections between disease and environment (problems 3-4, 6, 8-29), concluding with a section on pharmacology and therapeutics (problems 30-57). Of the ten books that follow, seven collect

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4See De Leemans and Goyens (2006).
rather specialised enquiries, on physiological phenomena and conditions connected with sweat (book 2), drunkenness (3), sex (4), fatigue (5), bodily position (6), chill and shivering (8), scars and bruises (9). It is their interest in different functions or states of the human body that justifies our characterisation of these books as “medical,” along with the fact that they align with the interests of the first book, insofar as they too explore the physiological mechanism behind the phenomena in question, enquire after pathological conditions and/or therapeutical prescriptions associated with them, and discuss the role of the environment.  

Books 7 (on sympathies) and 10 (on animal biology, comparing humans and animals in terms of their reproductive habits, character of offspring, general physical or behavioural attributes, and organic functions) discuss the human body in terms of its analogous functions to other physical bodies, animate and inanimate. In book 11, finally, enquiries on the human voice alternate with discussions of phenomena such as the echo and sound, thus opening the ground for the predominantly naturalist investigations that will follow (in books 12-30).  

The human body re-surfaces as the focus of investigation in the last eight books, which concentrate on different anatomical parts: the eyes and vision (book 31), the ears (32), the nostril (33), the mouth (34), touch (35), the face as a whole (36), the body as a whole (37), and complexion (38).

A more detailed consideration however allows us to gauge some principles of selection and organisation that enable appraisal of the medical books as results of thoughtful planning on the part of the Problemata’s authors and redactors. In the first instance, we may note that

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Moreover, these books encompass topics falling under the scope of letters (book 18), music (19), meteorology (23-6), and moral theory (27-30).
standard topics of ancient medical literature, such as surgery and gynaecology, are almost entirely absent from the Problemata’s medical books, as are anatomical investigations concerned with the internal parts of the body (such as the bones). Similarly, therapy and dietetics (foods, regimen and pharmacology) only have a presence (most prominently, in the first and third books) insofar as the properties of drugs and foodstuffs, and their interaction with the human body are concerned; practical prescriptions on regimen and healing are on the whole absent. Secondly, the opening group of medical books appears to move from a general first book on medicine, to more narrow-focussed physiological investigations, while in the closing set the progression is from specific anatomical parts located at the top of the body (the head) to the whole face, the whole body, and complexion (again pertaining to the entire body). In addition, the topics treated in the second group of medical books in part echo or reduplicate those of the first group: such is especially the case with the enquiries concerned with vision in book 31 (31.2, 4-11, 14-17b, 19-22, 25-28, reminiscent of similar discussions in book 3),

shuddering (33.16, 18; 35.1, 3, 5, 9, 37.4, reminiscent of similar or identical discussions in book 8),

discussions of the role of the environment and sweating in books 37 and 38 (37.1-3; 38.1, 3-8, reminiscent of similar discussions in books 1 and 2, respectively), and others.

Thirdly, books 1, 7, 10 and 11, as we saw, explore the human body in close interaction with its natural

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1Cf. the Hippocratic corpus (see treatises On Fractures, In the Surgery, On Joints and Mochilicon, On Female Nature, Female Diseases, On Sterile Women, On the Excision of the Foetus), as well as other medical authors, such as Diocles (see frs. 17-24c, 160a-167, 168-75 van der Eijk), or Soranus (Gynaecology).

2E.g. 3.9-10; 20; 30.

3E.g. 3.9-10; 20; 30.

4E.g. 8.8, 8.12-13, 8.15, 8.19, 8.21.


6E.g. 31.26 (cf. 10.50), 33.10 (cf. 10.18, 54).
environment, or compare its functions with those of other bodies, thus putting the focus on its place in the broader order of nature (note especially the title of book 10, ἐπιτομή φυσικῶν ["epitome of natural problems"], which underlines that biological functions constitute part and parcel of the investigation of nature).\textsuperscript{13} Last but not least, thematic overlaps between medical and naturalist books further consolidate the impression that their discussions are meant to be examined in close conjunction. Thus, the climate, water, winds and their impact on humans are discussed not only in book 1 but also in book 14\textsuperscript{14} and in the meteorological books (23-26); while discussions of phenomena connected with the sea are not limited to book 23, but also include enquiries into the ears of divers in book 32 (32.2-3, 5, 11).

The limitations imposed to the range of medical material selected for inclusion must surely be purposeful, given that Quellenforschung has demonstrated that the authors of the Problemata's medical sections were in contact with a rich background of medical, biological, naturalist and historical sources.\textsuperscript{15} If so, it would speak of a method of selection that sought to serve the aims of a theoretical study of medicine, leaving aside its more practical aspects. This is fully in tune with the underlying concern with highlighting, at key points, areas of convergence between medicine and naturalist investigation; and it must also be intrinsically connected with the fact that medical topics act as a frame to the collection as a whole, with the second group of medical books being, in certain respects, the mirror-image of the first. We

\textsuperscript{14}Marenghi (1965) includes it among the medical books.
\textsuperscript{15}On the Problemata's sources, see (in overview), Flashar (1962, 333-41), as well as individual commentary sections. On the use of Hippocratic sources in particular, see Bertier (1989), Jouanna (1996a) and (1996b), and Thomas in this volume. See also Ulacco (2011, 66-80).
may recall Aristotle’s circumspect attitude to medicine in two well-known passages of the
Parva naturalia, according to which natural science and medicine can overlap in terms of their
interests, but only up to a certain degree: the natural scientists conclude their investigations
with the study of medicine, while the doctors who practice their art in a more philosophical
manner base their theories on the principles of natural science (οἱ μὲν τελευτῶσιν εἰς τὰ περὶ
ιατρικῆς, οἱ δ’ ἐκ τῶν περὶ φύσεως ἄρχονται περὶ τῆς ιατρικῆς, De sensu 1.436a20-b2).16 The
Problemata may well be seeking to respond to this Aristotelian position, its macrostructure
drawing special attention to medicine as a field that, while distinct from that of natural
science, can nevertheless contribute helpful insights to the broader investigation of nature.17

2. The Cohesion of Problems within (and Beyond) the Medical Books

The Problemata’s contents tend to be punctuated by loosely-knit units of thematically-related
enquiries, which usually do not fully encompass all of the thematically-similar material in a
single sequence, but are interspersed across the length of a single book. In the first book for
example, problems 1-4 and 13-6 deal with the topic of change generally, while problems 8-12

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16 Cf. parallel statement in Resp. 480b22-31. However, these views are not the full story, as we
know that the philosopher in all likelihood wrote extensive works on medical matters. The
surviving lists of Aristotle’s works attribute to him works entitled ἱατρικά (in 2 books: D.L. 5.21
#110), περὶ ἱατρικῆς (in 2 or 6 books: Anon. #110), προβλήματα ἱατρικά (in five books: Ptol. #70).
See Moraux (1951, 110-111, and frs. 373-79 Rose³, 353-62 Gigon. See Mayhew (2012), on book 1’s
possible ties to those lost works. On Aristotle’s and his pupils’ interests in medicine, see
Longrigg (1995), Lombard (2004), van der Eijk (1995) and (2005, 139-275), van der Eijk and
Francis (2009).

17 Flashar attributes medicine’s special position to the medical point of view that, in his view,
runs through the Problemata as a whole (durchgehende[...] medizinische[...] Betrachtungsweise; 1962,
330). The opposite seems to be the case, however: what I believe is at stake is the integration of
medicine into a naturalist’s point of view, hence the fact that the work’s medical topics are
approached from a theoretical standpoint.
and 17-29 discuss specific environmental conditions that produce disease; problems 40-43 and 47-48, finally, deal with drugs that loosen or purge the stomach and bladder. Similarly, in the fifth and eleventh book, problems 5.15-20, 5.23-26 and 5.39-41 explore fatigue in connection with running and walking, and 11.35-36 and 54-55 discuss stammering, respectively. Such a meandering sequence might be tied to the cognitive processes and patterns of scientific research that were adopted by the different authors who gave input to the Problemata’s medical books: free to take up, develop in different directions, or re-consider various lines of enquiry, they left a vast record of overlapping sets of problems and solutions on select medical topics, which were however never distilled into a tightly focussed, methodical exposition, of the kind that we find in Aristotle’s biological works.

Yet despite their disjointed format, the Problemata’s medical books must have afforded opportunities for productive reading throughout their afterlife, otherwise they would never have inspired the composition of later collections of medical-naturalist problems which, far from seeking a more orderly exposition, aimed at reproducing the Problemata’s miscellanistic surface. I argue that one of the advantages of the medical books’ format lay in the ability to encourage comparative appraisal of problems, solutions, or specific arguments. In their current version, this is achieved in the first instance through the use of internal cross-references. These are usually introduced with two standard formulas, namely, “this is the same problem” (ταὐτὸ ἐστὶ πρόβλημα), or “to this we shall give the same answer that we gave to the

18Cf. also 31.12-13 (on the senses on the right), 15-16 (on shortsightedness), 17a-b (on double vision), 26-27 (on strabismus); 32.2-3, 5, 10-11 (all on the ears of divers); 34.7-9, 11-12 (on breathing).
19See Oikonomopoulou (2011), on Plutarch’s Sympotic Questions.
previous problem/the problem above” (καὶ περὶ τοῦτον ταῦτὰ ἐροῦμεν τῷ προτέρῳ/ἐπάνω). In addition, the passive verb εἴρηται (“it has [already] been stated”) is used in order to denote that a specific argument or theory that has already been offered is relevant in the context of a new answer as well. Thus, problems 2.37 and 2.39 both direct their readers to problem 2.36’s answer, the former by referring to it with the phrase τῷ προτέρῳ (which underlines the close sequence of the two enquiries), and the latter with the phrase ἐπάνω, which serves as a pointer to an earlier, but not immediately preceding, part of the text.

Problem 3.13 cross-refers to the conclusion of the previous one (3.12), namely, “that drunkenness is due to the upper parts being heated has been stated (εἴρηται),” as fundamental to its own argument that the anti-intoxicating properties of sweet substances (including sweet wine) consist in their sticky quality, thanks to which they block the passages (πόροι) through which the wine’s heat rises up (872b34-873a1). Finally, problem 3.22 adduces as part of its explanation why well-mixed wine causes more serious hangovers than the unmixed variety the argument that unmixed wine has the ability to concoct everything else, which leads, in turn, to the closing statement “this is the same problem.” The statement cross-refers to the immediately preceding problem (3.21), whose investigation of why the stomach becomes drier (rather than moister) when one drinks a lot hinges upon the question how the body concocts wine, depending on the quantity in which it is consumed (the answer is that large quantities of wine are not concocted by the stomach, but end up in the bladder). In this instance, then, the cross-reference serves to underline the scientific process that is central to both problems’

20Cf. 3.9-10, 4.23-24, 10.22-23, 11.6.899b9-10, possibly cross-referring to 11.3.899a13, with the phrase: ὡσπερ καὶ διηπόρηται.
explanations, namely, concoction. (Cf. 5.39-40.) In this way, internal cross-references highlight the applicability of certain explanations or arguments across enquiries, thus drawing attention to the latter as parallel, or overlapping manifestations of the same phenomenon.

Secondly, the use of associative transitions ties even thematically unrelated problems together, prompting their examination as interconnected units, rather than as standalone enquiries. A characteristic example is afforded by the first five problems of book four (on sexual intercourse). The opening three discuss sex in connection to the eyes and vision (why it is that, during intercourse, the eyes are cast upwards (4.1); why they sink (4.2); why they lose their sharpness (4.3)). Next, the discussion proceeds to the question of why hair growth accompanies sexual maturity in humans (4.4), and why being barefoot may not be beneficial when having sex (4.5). The common thread, namely, the focus on different anatomical parts of the body, is clear enough. But there is also a subtler network of associations underpinning the transition from one problem to the next: on a broad level, we note a movement from the uppermost parts (the eyes) to the lowermost (the feet), which, if we study the problems more closely, is foreshadowed by the discussion of the eunuchs’ swollen legs and loosened bowels (due to the transference of their body’s moisture downwards) in problem 4.3 (876b31-32); as well as by the discussion of hair, which probably implies both facial and pubic hair, in problem 4.4 (876b33 ff.). Problems 5.35-37 provide another example. Even though they treat independent topics under the umbrella of the book’s wider theme, fatigue, these lead to one another via associative links: thus, 5.35 brings up the issue of irregular walking, alternating
between pauses and movement, as responsible for why short walks are fatiguing; 21 5.36 picks up on 5.35’s reference to bodily movement, and seeks to explain why it is heat-producing. 5.37, in turn, follows up on the reference to the cold air at the end of 5.36: there, it is mentioned as the factor that cools the body of somebody who walks; now, it is thought of as the cause behind the riders’ and runners’ tears. In other medical books as well, problems which treat different topics can succeed one another on the basis that they invoke a similar explanation (for example, 10.1 and 10.2 attribute coughing and blood flow from the nostrils (respectively) to the same physiological process, namely, the fact that humans have the largest and moistest brain), or by means of antithetical thinking (for example the thin blood in 10.2, leads to reflection on thick flesh in 10.3, the thick flesh of women and children in 10.4, and the thinner skin of humans in comparison with that other animals in 10.5). 22 In this way, associative links put into relief key concepts (the body as a series of interlinked parts, the moist brain, the role of heat and cold) that carry special significance for medical enquiries, as well as providing mnemonic threads for navigating the medical books’ contents.

Thirdly, revisiting enquiries, either within the same book or across different books, encourages alternative perspectives on the same problems. 23 When we are in the context of the same medical book, replications of material are concentrated towards the end: this suggests that scientists likely read back to the beginning, in order to select problems suitable for fresh

22 The technique of association is more familiar to us from imperial problem-collections (namely, Plutarch’s Symptic and Natural Questions, the Medical Problems of pseudo-Alexander of Aphrodisias, or the anonymous corpus of Supplementary Problems), where it probably constituted a conscious choice on the part of their authors.
23 Cf. discussion in Flashar (1962, 323-25).
investigation. Problems 33.1, 33.5 and 33.17 provide a characteristic example: 33.1 asks why sneezing stops hiccups, but not belching. After clarifying that belching is an affliction of the stomach (and therefore unaffected by sneezing), while hiccups are of the lung (which is connected to the nose and brain through the process of respiration), the problem goes on to explain that the hiccup is caused by a lack of concoction: sneezing however, just like vinegar and holding one’s breath, causes both the nose and lung to heat up, thus helping to achieve concoction, and thus to stop the hiccups. Problem 33.5 asks why sneezing and vinegar stop hiccups, essentially making use of the same explanation as 33.1, but with improvement in clarity (especially on the movements of breath and moisture within the body). Lastly, 33.17 re-focuses the question (it asks simply, why sneezing stops hiccups), picking up elements from the solutions of both the previous problems for its own answer. Even though each problem formulates its question in different terms, the explanations of all three present considerable overlap, each one adding a slightly different perspective on the enquiry at hand. In the case of enquiries that are replicated across different books, the change of context allows for an evaluation of the problem from a different perspective: thus, the enquiry of 1.48 (why fragrant seeds and plants are diuretic) is replicated almost verbatim in 12.12 and 20.16, both of which add some more information. In 1.48, the enquiry is found in the context of problems that discuss the effects of various drugs on the body. In 12.12, it is found in the context of enquiries that discuss the properties of other fragrant things (plants and substances, such as wine). 

The meaning is not very clear: the author seems to argue both that sneezing causes concoction of breath and moisture (961b12-13), and that it causes the enclosed air that causes the hiccup to break up (ῥήγνυσι) (b26-27): presumably the release of that confined air enables its concoction.
20.16, finally, it has been inserted within a book that discusses shrubs and vegetables. This replication not only invites reflection on different possible classifications of fragrant seeds and plants (as drugs, as a special category of fragrant substances, or as (edible or inedible) plants), it also allows us to comprehend the terms in which the Problemata’s medical and naturalist books are inter-complementary: doctors who seek to heal their patients and naturalists interested in classifying plants or explaining their different properties alike ask essentially the same questions about fragrant seeds and plants.

Cross-references, association, and the presence of parallel problems within the same book, or across books, ensure that the reader of the Problemata’s medical sections draws connections between often distant problems; anticipates parallel treatments of certain topics later on, or in different contexts; makes note of the fact that certain theories or concepts may be applicable to different kinds of enquiries; and, last but not least, is able to evaluate the parallel solutions in terms of their cogency. These responses, which rely on a process of reading the Problemata’s medical books sequentially, or re-reading them, are essential to the critical comprehension the collection’s medical subject-matter, as well as to the broader understanding of medicine as a component of naturalist investigation.

3. Questions and Answers in the Medical Sections: Format and Causation

The medical books of Problemata treat, as the terms themselves suggest, problems of medical content. How should one go about with the investigation of medical subject-matter, however? Neither Aristotle nor his successors bequeathed to us a theory of posing and solving problems that is tailored to medical problems in specific. We only possess his well-known definition of
the dialectical problem in the *Topics* (1.11.104b1-18), his discussions of scientific problems and guidelines for solving them demonstratively in the *Posterior Analytics* (2.1.89b23-35), as well as actual examples of naturalist problems that he poses and solves in his works (especially his zoological writings). These, together with examples in other medical and Peripatetic literature (including the *Anonymus Londinensis*, Theophrastus’ *On Sweat* and *On Fatigue*, or pseudo-Aristotle’s *On the Flooding of the Nile*) are nevertheless useful for understanding the wider context of the medical books’ method of posing and solving problems.

In the overwhelming majority of cases, the *Problemata* investigates medical topics by means of issuing problems introduced with διὰ τί. . . ; (“why. . . ?”), which enquire after the causes of various physiological phenomena or conditions. A handful of enquiries, most of them concentrated in the second part of the first book, are introduced by πότερον . . . ἢ (οὐ). . . ; (“is it the case that . . . or (not). . . ?”) The same part also offers the greatest diversity of question-formats, including questions introduced by τίς . . . (ἡ ἀρετή); (“what is the virtue of. . . ?”) (1.30, 1.33), or τῷ δῆλον. . . ; (“by what is it clear. . . ?”) (1.31). It also yields examples of enquires concerned with quality, introduced by ποῖα δὲ . . . (ἐ). . . ; (“which [wounds must one cauterise] . . . or [which must one cut].. . ?") (1.32, with the question expanded in 1.34; cf. 17.3, πῶς. . . ;), as well as a few cases of problems that lack a question-format altogether: these are 1.55-56, which are articulated as δεῖ-injunctions (“one should . . .”), and 1.57, making a general

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25 On these, see Lennox (2001a).
26 Aubert (2014, 646 F1). I would like to thank Stephen Menn for bringing this very interesting text to my attention.
observation that “some diseases come from fire, whereas others come from dampness” (εἰσὶ δὲ).

The issuing of enquiries in interrogative format was not unfamiliar to the ancient medical tradition, as attested by several examples within the Hippocratic corpus. The ἠρα/ἄρα- enquiries of the Epidemics, Prorrheticon, and Coan Prenotions are the most characteristic in this respect: as a rule, they are issued with an exploratory aim, in order to prompt the further investigation of facts, or the meaning of certain symptoms (hence the fact that they are rhetorical questions, which receive no answers). But not infrequently, they also seek to enquire after the causes of certain conditions: “he did not shiver on the seventh day (οὐκ ἔρρίγωσεν ἔβδόμη). Is it perhaps because his belly was disturbed? (ὣς ὅτι ἡ γαστὴρ προεταράχθη;)” (Epidemics 4.25 = Littré 5, 168.5). Causal enquiries formulated with διὰ τί also occur, suggesting a particular concern with reaching an accurate understanding of the factors that affect the human body, or can generate disease and other conditions: “we must consider these things” (sc. the different directions of various pains and ailments), suggests the sixth section of the Epidemics, “in what way (ὂπη), from where (:hidden:), and for what reason (διὰ τί)” (6 = Littré 5, 280.2-3). Texts such as Regimen in Acute Diseases even posit that it is essential for


29 See, in this respect, esp. VM 20 = Littré 1, 620-624 = Jouanna 145.17-148.2, with Schiefsky (2005) ad loc. See also Vegetti (1999), Jouanna (2005), and Barton (2005).

30 Cf. Epid. 6 = Littré 5, 282.
medicine’s very credentials as an art to probe into issues such as the reasons why doctors prescribe different regimens for acute diseases:

For instance, it has not been ascertained (ἀκαταμάθητα οὖν καὶ τά ἐστίν,) why (διὰ τί) in acute diseases some physicians think that the correct treatment is to give unstrained barley-gruel (πτισάνας ἀδιηθήτους) throughout the illness; while others consider it to be of first-rate importance for the patient to swallow no particle of barley, holding that to do so is very harmful, but strain the juice through a cloth before they give it. Others again will give neither thick gruel nor yet juice, some not before the seventh day, others at no time until the disease reaches a crisis. Now certainly physicians are not at all in the habit of even raising such questions (μάλα μὲν οὖν οὐδὲ προβάλλεσθαι τὰ τοιαῦτα ζητήματα εἰθισμένοι εἰσίν οἱ ἱπτροί;) even when they are raised perhaps nothing is learned (ἰσως δὲ οὐδὲ προβαλλόμενα γινώσκεται). Yet the art as a whole has a very bad name among laymen, so that there is thought to be no art of medicine at all. (Acut. 7-8 = Littré 2, 238.11-240.8; Jones trans.)

We may compare this with problem 2.21, which enquires after whether it is better to induce sweating in the summer, rather than in winter (πότερον δεῖ μᾶλλον τοῦ θέρους παρασκευάζειν τὸ ἱδρόν ή τοῦ χειμώνος; 868a25-34). The formulation πότερον . . . ή . . ., is familiar from Aristotle’s definition of the dialectical problem in the Topics (104b1-18). The first answer makes a case for winter being the most appropriate time, as bodies are moister then, the change (μεταβολή, presumably in climate and weather conditions) is greater, and the residues

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31 Cf. VM 20 = Littré 1, 622; Flat.: Littré 6, 98; 19-22. Morb.: Littré 7, 542.
32 See also Pr. 1.37, 50b; 2.12, 2.33; 9.6. Cf. 12.10.
are not as easily concocted (τὰ περιττώματα οὐ συνεκπέττεται) (868a26-30). The second answer begins with an objection to the first one: “then again (πάλιν . . . ἐτι), sweating in winter, when the body is cooled, is against nature (παρὰ φύσιν)” (868a30-31). The conclusion therefore follows (δὴλον ἄρα ὅτι) that the summer is a better time, which is further justified through the argument that this is when moisture putrefies (therefore one needs to remove it by means of sweating), and by adducing in support the agreement of “all the ancients” (οἱ ἀρχαῖοι πάντες) on the matter (868a30-34).33 The problem, finally, includes the presence of a doxographical element (what “all the ancients claim,” on the whole extremely rare in the Problemata’s medical sections)34: we are reminded of the guidelines issued by Aristotle in his Topics 1.14, on how to excerpt and classify statements and opinions from individuals on specific issues, in order to use in dialectical debate.35

Yet despite its format our problem is primarily concerned with causes (why a certain therapeutic procedure is better than another, the reasons attributed to the conditions of the environment, and how they affect the human body). We may compare with two subsequent problems that treat the same subject in the same book, 2.33 and 2.42: problem 2.33 issues the exact same πότερον . . . ἦ . . ; question as 2.21, but puts its weight on developing only one side of the answer, namely, that it makes more sense to induce sweat in the summer (869b32-70a5);

33The “ancients” probably does not include Theophrastus: Flashar (1962, 429) had surmised a dependence of Pr. 2.21 on Sud. 23, but the connection is (correctly) rejected by Fortenbaugh (2003, 104), who does not see any close parallels in content. Hippocratic authors, and Diocles of Carystus, may be implied, among others, though, again, there are no close parallels (cf. Diocles fr. 30a-d van der Eijk).

34See also 3.16. The near-total absence of doxography is what distinguishes the Problemata’s medical books from Peripatetic problem-texts such as the On the Flooding of the Nile.

2.42, in turn, converts the question into a why?-type enquiry into the particular reasons why one should not want to induce sweats in winter (thus taking it for granted that they are more beneficial in the summer). It seems that the “orthodox” answer to the question, so to speak, was to argue that it made more sense to induce sweats in the summer, rather than in winter. The different reasons each problem adduces in support of this view suggest the debate revolved around the issue of which physiological factors to pinpoint as central to the explanation. In this way, they put into relief the process of critical judgement that underpins the choice of therapeutic praxis, and, more broadly, point to the relevance of scientific speculation to practical matters of regimen and treatment.³⁶

The Problemata’s medical books are overwhelmingly orientated towards the investigation of what causes various bodily states and physiological conditions: their why?-type enquiries seek to problematise the links between illness and environment; probe into the underlying physical mechanism of health, disease, or other key physiological phenomena, such as sweat, sex, drunkenness (in terms of the interactions between physical elements, and the role of different physical processes within the body);³⁷ and enquire after why (in terms of what powers, or qualities) certain substances such as drugs, or antidotes, are efficacious. By contrast, the factual basis of these states (whether they hold or not, and what they are in terms of their essence, or substance) is not usually at issue, nor are operations such as the classification of

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³⁶Cf. Aristotle’s mention, in Topics 1.10 (104a33-38), of dialectical propositions of medical subject-matter, part of a wider category of dialectical propositions which accord with the arts (ὅσαι . . . κατὰ τέχνας εἶσιν).

diseases or symptoms.\(^3\) The opening question of the first book allows us to comprehend what is at stake. The question that is asked is why certain excesses (sc. of certain elements in the environment) are disease-producing. They produce either excess or defect (sc. within the body), the answer suggests, which \emph{are} in fact disease (859a1-2).\(^9\) The problem embeds the definition of disease as excess or defect (sc. of certain elements within the body) to its explanation, according to the following schema:

- Great excesses (A) produce either excess or defect (B)
- Excess and defect (B) are disease (C)
- Great excesses (A) produce disease (C)

Excess and defect are the “middle term” that explains why great excesses cause disease (according to Aristotle's method of scientific demonstration\(^4\)). Finding the middle term, as Aristotle explains in the \emph{Posterior Analytics} (2.14.98a1-23), is predicated on a specific methodology that involves the division of the subject under question according to its genus and species, and the listing of the attributes that universally apply to each individual class. Once one has carefully mapped out their subject in this way, they can proceed to the solution of their problem demonstratively, by showing that something holds of a given class, or category, because it holds of a class or category that stands above it in the hierarchy as well.

\(^3\) Cf. other medical works in question-and-answer form, such as Caelius Aurelianus’ \emph{Medicinales Responsiones}, as well as medical papyri written in this format, which do provide such lists.

\(^9\) Emphasis following Mayhew (2011) ad loc.

\(^4\) As Barnes puts it, “for any facts \(p^1\) and \(p^2\), if \(p^1\) explains \(p^2\) then there is a demonstrative syllogism \(AaB, BaC\) \(AaC\) such that \(AaC\) expresses \(p^2\) and the middle term expresses \(p^1\)” (1994, 205). Cf. also \emph{APo.} 2.8.93a29-b13. See also Hankinson (1998, 125-88).
There is no doubt that this methodology is relevant to the solution of the causal enquiries issued by the *Problemata*’s medical sections (although more systematic study is required).

Problems such as the above, which offer a single answer, comprise the greatest majority within the *Problemata*’s medical books (about eighty percent of all problems).41 We also encounter problems which propose multiple solutions (between two and five), thus opening a larger field of possibilities. Usually no statement of preference between them is given, the final judgement left to the reader. In cases such as problem 4.31, however, the intellectual reasoning that is followed acts as an indication of how criteria of judgement should be applied:

> Why are birds and hairy humans lustful? Is it because (νῶτερον ὅτι) they contain much moisture? Or is this not so (for the female is moist, but not hairy), but it is because (ἡ οὖ . . . ἀλλὰ ὅτι . . .) both natures concoct a lot of moisture owing to heat? A sign of this is the hair and the feathers. Or is it because (ἡ ὅτι) there is a lot of moisture, and it is mastered by the heat? For if there were not a lot of moisture or if it were not mastered, then hair would not grow on the one or feathers on the other. Now the seed comes to be plentiful in such places and seasons, for example in the spring; for its nature is moist and hot. And for the same reason, both birds and the lame are lustful; for in both, the nourishment below is meager owing to the deficiency of their legs, but (more nourishment) goes to the upper region and is condensed into seed (880a34-b8, Mayhew trans.)

4191 out of 483 problems in the medical books offer two or more solutions. This is roughly the same analogy as for the remainder (non-medical) books, where 71 out of 401 problems propose more than one solution.
In this example, the second possibility relies upon the rejection of the first one (on the basis of the female constituting an exception to the rule that moisture necessitates hairiness, and hence lust), while the third possibility is a synthesis between the previous two (both the moisture and the concocted heat boost the production of seed, as they also cause feathers and hair to grow). The right solution is then to be identified with the most adequate explanation, in the sense of the explanation that takes the full spectrum of contributing factors into account (abundance of moisture, together with its mastery by the heat).  

What is most distinctive to the medical books’ answers is their emphasis on material causes—that is, causes located in the properties, movements, functions, and interaction of material substances. Teleological explanations are nearly non-existent: the problems frequently state that certain physiological conditions or diseases ensue from various processes within the body out of necessity, as in the following passage from problem 2.41 (on why sweats that occur within the body automatically are considered worse than those that ensue from exertion):

But the sweats that are named automatic, and that occur by necessity (ἐξ ἀνάγκης) when the heat is not completely captured because the natural passages are disturbed by large

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42 Cf. e.g. 3.26, 5.13, 5.37, 8.17, 9.3 (contrast with problems such as 2.4, 2.9, 3.31).
amounts of moisture, but still can resist and secrete it, are reasonably regarded as a sign of disease (εὑλόγως νόσου σημεία φαίνεται)’ (870b20-25, Mayhew trans.).⁴⁵

We may recall Aristotle’s statement in the opening of the fifth book of the *Generation of Animals* that, for certain types of conditions (παθήματα) that occur to animals (such as colour of eyes, pitch of voice, or colour of hair), we lack the ability to provide the final cause, and must, instead, remain content with explaining the change as stemming out of necessity (meaning due to changes in material substance involved) (778a16-b19). It seems that the medical books on the whole treat diseases, pathological phenomena, and physiological states such as sweating as conditions of analogous type—that is, as alterations to the body’s state that can only be attributed to necessity (by which the physiological impact of changes to the movement, distribution, quantity or quality of bodily substances such as heat and moisture is meant, as in the passage above).

4. Conclusions

The medical books of the pseudo-Aristotelian *Problemata* hold for many reasons the key to the collection as a whole. This is because they not only provide vital clues as to the broad scientific interests of the Peripatetic scientists who contributed to the *Problemata*, they also invite productive speculation on their conception of the relationship between different scientific fields, the order in which they ought to be studied, and the procedure one should follow in order to investigate them via the technique of posing and solving problems. The structural and methodological features of the *Problemata’s* medical books that I have here drawn attention to

⁴⁵See also 860b20-21, 862b4, 877a14-16, 881b13-18, 892b12-13, 894b10-11.
allow us to gauge the scientific mindset and authorial objectives that drove their composition, and, for this reason, they can also afford fruitful starting-points for a more systematic understanding of how this vast agglomerative work came to acquire its present shape and form.


