P. MICHIGAN XVII

THE MICHIGAN MEDICAL CODEX

(P.Mich. 758 = P.Mich. inv. 21)

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Editor
Ann Ellis Hanson

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To HCY

In loving memory

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Editor's Preface

Louise Canberg Youtie first published P.Mich. inv. 21 as the 'Michigan Medical Codex' in five separate installments in *Zeitschrift für Papyrologie und Epigraphik*: 65, 1986, 123-149; 66, 1986, 149-156; 67, 1987, 83-95; 69, 1987, 163-169; 70, 1987, 73-103. I and many others have long thought the Michigan Medical Codex of such significance to many aspects within Classical Studies that it should be reissued as a monograph in its own right, so as to attract the attention of historians of ancient science, textual critics, intellectual historians, and classicists, in addition to papyrologists. Through the generous cooperation of the current editors of *ZPE* and its publisher, Dr. Rudolf Habelt of Bonn, the American Society of Papyrologists received permission to republish the separate fascicles as monograph 35 in its series *American Studies in Papyrology* and to range the text as *P.Michigan* XVII 758 in the ongoing series of publications of papyri in the University of Michigan collection.

The work of scanning the pages from the volumes of *ZPE* and of composing the volume was done by Jeremy Taylor, graduate student in the Department of Classical Studies, University of Michigan. Jeremy brought to the project not only his keen knowledge of Greek and of the ancient Mediterranean world, but also his considerable expertise in computer manipulations. The funds under which Jeremy worked were generously made available by the acting Dean of Rackham Graduate School, Robert A. Weisbuch, through the agency of Professor Ludwig Koenen. Publication costs were, in part, offset through the generosity of an anonymous donor. To all of the above, the American Society of Papyrologists expresses its gratitude, and I, as editor of the series, add my heartfelt thanks as well. This was a project well worth doing.

Louise C. Youtie has long been associated with the University of Michigan, finishing her BA in 1932 and her MA in the following year. After her marriage to Professor Herbert C. Youtie in 1934, she too became a constant and tireless worker in Michigan's papyrology collection. Her first assignments were to prepare the indices for

P.Michigan IV, the two-volume *Tax Rolls from Karanis* that appeared in 1936, and to check the proofs for these volumes, whose total number of lines exceeds that of Homer's *Odyssey* and is nearly as long as the *Iliad*. Louise Youtie became ever more closely involved with Professor Youtie's research in papyrology and undertook an increasing number of projects on her own, publishing texts of documentary papyri and offering corrections for already published texts. In particular, she became expert in dealing with the medicinal recipes that the Greco-Egyptians of Ptolemaic and Roman Egypt jotted down on pieces of papyrus, on broken pieces of pottery, and other available writing surfaces. Her work in papyrology had so coalesced with that of her husband that when the Festschrift *P.Coll.Youtie* I-II (= *Collectanea Papyrologica* I and II = *Papyrologische Texte und Abhandlungen* XIX and XX) was presented to Herbert Youtie in April, 1976, Ludwig Koenen spoke in the following manner, not only about Herbert Youtie's many contributions to the field of papyrology, but also about those of Louise Youtie:

> Your work is her merit too, and this not only in the general sense that she created the atmosphere you needed for your work, but in the very sense that she has an active share in it. She is your partner who listens to you, but also criticizes your suggestions in her own mild, but charmingly determined way, and she adds her own comments. You would publish nothing without convincing her first.

Louise Youtie spent only a few years of her adult life away from Ann Arbor, accompanying Herbert Youtie as he spent two years in Oxford and a year in Köln between 1957 and 1964. Otherwise, she was ever in the Papyrology Room, as this peregrinated about the Michigan Library System, finally coming to rest atop Hatcher Graduate Library in the legendary Room 807. Appeals for help with papyrological matters came to Room 807 from around the world, as colleagues and former students turned to the Youties. Louise Youtie answered queries about readings in specific papyri and supplied photographs, all with wondrous quickness. In the days before fax and e-mail, Louise Youtie could be counted on to ready a

response within hours of receiving your question, as I and many other beneficiaries of the Youties' attentions can attest.

The Michigan Medical Codex (P.Mich. inv. 21) occupied her for many years, but she determined to bring it to publishable form after Professor Youtie's death on 13 February 1980. It was a Herculean effort, and we are all in her debt that she brought it to so fine a conclusion. It is my hope that the Michigan Medical Codex, P.Mich. inv. 21, will reach the wider audience it so richly deserves in its new format as *P.Michigan* XVII 758.

Ann Ellis Hanson
Editor,
American Studies in Papyrology

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Introduction

Ann Ellis Hanson

P.Mich. XVII 758 (= P.Mich. inv. 21)[1] is an important text in papyrological studies, where it takes its place among the relatively early codices from the IV century CE.[2] It is an equally important text in the history of the medicine of the Greek and Roman world and in the history of the transmission of ideas, as these are passed from one generation to the next. As Mrs. Youtie's introduction makes clear (pages 1-3), the codex was probably commissioned by its owner, a practicing physician, and then considerably expanded by him with additional recipes he no doubt found helpful in his day-to-day practice among the sick. Galen seems to have been acquainted with doctors' habits of noting down useful medicaments. In his *De compositione medicamentorum secundum locos* I 1 he mentions that his friend Claudianus found the recipe Galen has just written out in his treatise jotted down in a leather notebook that formerly belonged to a physician who died.[3] Claudianus thought the medicament of considerable importance to possess, because he had seen two men who were beginning to bald cured by it, with the results that their baldness not only did not advance, but the medicament even made their bald spots hirsute. Unfortunately in the case of Claudianus' discovery, the physician had written down the medicaments in symbols. Galen and unnamed colleagues were thus forced to work through the recipe

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[1]P.Mich. inv. 21 was not published in time to be included in Marie-Hélène Marganne and Paul Mertens, 'Medici et Medica,' *Proceedings of the XVIII International Congress of Papyrology, Athens 25-31 May 1986* I, Basil G. Mandilaras, ed., Athens 1988, 105-146 (= Pack[3]). It does appear, however, as 2407.01 in the second edition of 'Medici et Medica' that Marganne and Mertens prepared for the conference '"*Specimina*" per il *Corpus dei Papiri Greci di Medicina*,' held at the Istituto Papirologico 'G. Vitelli,' Firenze, 28-29 March 1996; this second edition of 'Medici et Medica,' updated to 15 March 1996, will also be published in the forthcoming *Acta* of that conference, edited by Manfredo Manfredi and Isabella Andorlini Marcone. The codex is also included in the inventory by Andorlini Marcone, 'Papiri e scienza medica antica,' *Aufstieg und Niedergang der Römischen Welt*, Wolfgang Haase, ed., Berlin - New York 1993, 458-562, and appears as number 121 on page 523.

[2]Described below, pages 1-3. See also the recent, general discussion of the codex format in Isabella Andorlini, 'Precisazioni sulla data di alcuni testi di medicina in forma di codice,' *Proceedings of the 20th International Congress of Papyrologists, Copenhagen, 23-29 August, 1992*, Adam Bülow-Jacobsen, ed., Museum Tusculanum Press: Copenhagen 1994, 410-13.

[3]*On the composition of medicaments according to places*, XII 422.17-426.8 Kühn.

point by point in order to determine what ingredients were being indicated by the various symbols, and, while one doctor thought one thing, another thought something else. As a group, however, they were hoping to discover the truth through trial and error. Galen has written down the recipe as it seemed to them then, but he also promises to report to his readers any additional findings that subsequent trials might in future yield about the ingredients.

By contrast, the additional recipes in the Michigan Medical Codex are not jotted down in a leather notebook, but into the bottom margins of the recipe book, and in folios G-M these additions more than double the number of medicaments originally copied out by the scribe (below, pages 56-79, plates 7a-13b). Fortunately, in this instance the physician-owner wrote out his marginal jottings in full enough form for us to understand them, at least in part, and not merely in symbols. At one point, he also seems to report his own experiences in the employment of a plaster intended to ease pain in a case of impacted bowels and severe constipation (H 8-9, μοι τῷ πόνῳ, pages 59-60). In addition, the physician-owner also corrected the main text, for the scribe he employed was sometimes careless. To be sure, the scribe also did some work of correction to the text he copied, and his professional's hand (Hd. 1) differs significantly from the faster and smaller cursive in the bottom margins that were penned by the physician-owner (Hd. 2). The physician-owner's ligatured letters suggest that he was writing with greater speed than was the professional scribe, and he also employed a blacker ink than the scribe. Mrs. Youtie has dated both hands to the IV century CE.

Because the codex was purchased from dealers, we do not know the locality where it was unearthed, and thus have no clue as to where in the province of Egypt the physician-owner lived and practiced his medicine. On the other hand, the sophistication of his recipe collection, drawing its therapies from the work of considerably earlier pharmacologists also known to Galen (for which, see below), makes it likely that he had some contact with a medical library of some sort, either in Alexandria, whose medical schools remained important

throughout Byzantine times,[4] or in one of the locales which has yielded up other papyri of medical content.[5] The papyri of Alexandria are totally lost to us, due to the dampness of the capital and the entire Delta region, and even if the codex had been copied in the capital, it could not have survived to the XX century, unless it had been carried further south to the drier terrain that became desert during the Roman and Byzantine periods. A recent survey of published medical papyri[6] shows the metropolis of Antinoupolis leading the list of localities with 27 items of medical content among the papyri published to date, strongly suggesting a considerable medical presence there.[7] At the same time, the majority of the texts from Antinoupolis were copied in the VI-VII centuries CE; only three were copied as early as the III-IV centuries CE, and none earlier. Similarly, the Arsinoite village of Tebtynis, with its oracular and healing shrine of the crocodile god Suchos (Sobek), has yielded 10 items, yet these are considerably earlier in date than the Michigan Medical Codex, copied, as they were, in the I-II centuries CE. Perhaps the codex derived from the metropolis of Oxyrhynchus, for it stands second only to Antinoupolis with 22 papyri of medical content, and these show a range of date more in harmony with the Michigan Medical Codex, from the I-IV centuries CE. Or, perhaps it came from some village in the larger district of the Fayum oasis (Arsinoite nome), since 20 items derive from this area, and these also show greater variety in date, from the III BCE to the VI CE.

Whatever the origin of the Michigan Medical Codex, it is by no means a product out of the mainstream of medical and pharmacological thinking during the High Roman Empire, but is rather quite in touch with recipes also known to Galen and the later compendiasts Oribasius,

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[4]Cf. Ann Ellis Hanson, 'Fragmentation and the Greek Medical Writers,' forthcoming in *Aporemata* I, Glenn Most, ed.

[5]For a general discussion of the evidence available on Greek and Roman doctors, working together not only in medical matters, but also in other activities, see Vivian Nutton, 'The medical meeting place,' *Ancient Medicine in its Socio-Cultural Context* I, Ph.J. van der Eijk, H.F.J. Horstmanshoff, P.H. Schrijvers, edd., Amsterdam - Atlanta 1995, 3-25.

[6]My tabulations are drawn from the material in Andorlini Marcone (above note 1), 467 and 550-555.

[7]See also Marie-Hélène Marganne, 'La "collection médicale" d'Antinoopolis,' *ZPE* 56, 1984, 117-121.

Aetius, and Paulus Aegineta. The millennium that began with speakers of Greek arriving in large numbers in Egypt, following in the wake of Alexander and his Macedonians, and ended with the Arab conquest and its aftermath, brought Greek medical texts of many genres not only to Alexandria, but to the metropoleis and villages of the Egyptian countryside.[8] Mrs. Youtie has carefully noted at many points in her commentary correspondences between recipes in the Michigan Medical Codex and recipes that have come down to us in the writings of authors who survive in manuscript traditions. What is also clear from her notes is how vital a role the, availability of the Greek medical texts in machine readable form (TLG CD-ROM) now plays in discovering the correspondences between recipes in the Michigan Medical Codex and the similar lozenges and pills, and wet and dry plasters in the treatises of these other medical writers. As is frequently the case, the ingredients in a particular recipe display a striking degree of continuity from copy to copy, whether on a papyrus or in the manuscripts, despite the vagaries of transmission through hand-written texts over centuries.[9] For example, a plaster that in the papyrus codex is said to work 'wonderfully for ulcers and other conditions, because the affected parts of the body are healed by the application of the so-called *parygron*, a medication not to be despised' (A recto 4-8, pages 4-9), is compounded of pig fat, wax, and the metals white lead and litharge. Computer searches of the works of Galen, Oribasius, Aetius, and Paulus Aegineta reveal not only the same four ingredients compounded together in a prescription usually also labeled a *parygron*, but the proportions among the ingredients are virtually the same from author to author. Some compound a little, others a lot; some measure in drachmas, others in ounces, but invariably it is nearly twice as much pig fat as wax and about one-quarter of each of the two metals as the wax (see the chart on

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[8]For a recent survey of the contents of published medical papyri, see Marie-Hélène Marganne, 'La médecine dans l'Égypte romaine: les sources et les méthodes,' *Aufstieg und Niedergang der römischen Welt* 37.3, Wolfgang Haase, ed., Berlin - New York 1996, 2709-2740.

[9]In addition to A recto 4-8, see also B recto 2-14, pages 13-17; C verso 2-8, pages 23-27; D recto 10-15, pages 28-32; E recto 9-15, pages 36-44. Mrs. Youtie's notes to individual lines also draw attention to other, yet less extensive affinities between recipes in the codex and the medical writers.

page 9). For papyrologists, struggling to read a medicinal recipe written in a difficult hand on an abraded and lacunose surface, this degree of textual conservatism is, to be sure, a wonderful aid to restoration and understanding. To historians of medicine, however, the individual recipe's ability to preserve a relatively high degree of textual integrity in numerous hand-written copies from author to author, from century to century, underscores both the continuing interest in the recipe and a recipe's own completeness as an integral text in its own right. To be sure, the editors of *P.Ant.* III 186 emphasized the fact that this VI-century CE papyrus codex with medicinal recipes from Galen's *De compositione per genera*, books I, II, and VII, revealed significant textual variations from the only readily available published edition of the treatise (that by C.G. Kühn, 1827).[10] Nonetheless, as the Michigan Medical Codex makes clear, this notion of 'textual integrity' involves, first and foremost, the overall contours of the individual prescription and its ingredients, and does not necessarily extend either to its precise wording, or to its orthography. Additional ingredients may also enter a given copy of a prescription, for these were living texts and continually in use. The Michigan Medical Codex is one of the best examples of such a 'living text.' New prescriptions are added; nothing seems to have been subtracted. The written text is simply being ameliorated to reflect current practices.[11]

The format in which the prescriptions are presented in the Michigan Medical Codex is the common, fourfold one, consisting of title (*prographê*), indication of the conditions for which the medicament is useful (*epangelia*), enumeration of the ingredients with quantities given (*synthesis*), and the method of preparation (*skeuasia*).[12] Each recipe has its own heading in *eisthesis* to explain what the prescription medicated — 'A plaster which promotes cicatrization: it is effective against foul ulcers, discharging and chronic ulcers and wounds that are scarred over'

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[10]XIII 396-506, 956-1024 Kühn.
[11]Cf. Ann Ellis Hanson, 'Papyri of medical content,' *Yale Classical Studies* 28 (= *Papyrology*, Naphtali Lewis, ed.), 1985, 25-47, espec. page 45.
[12]Cajus Fabricius, *Galens Exzerpte aus älteren Pharmakologen*, Berlin - New York 1972, 24-30, with also a 'short-form.'

(B verso 1-14, pages 17-21). After the ingredients are listed and the directions for compounding and applying given, there come in this instance other subsidiary uses — 'It is also good for ulcers caused by burns.' Lines and spaces separate recipe from recipe, since in recipe catalogs it is imperative for users to know exactly where one recipe finishes and a new one begins.[13]

The different contexts into which one and the same recipe can be inserted, however, varies considerably, since most recipes can adapt to a variety of catalog styles and organizing principles. Some recipe catalogs are ranged according to types of medicament; others, according to parts of the body affected; and, less frequently, according to the conditions to be medicated. The organizing principle in the Michigan Medical Codex, one of the largest catalogs of therapeutic prescriptions on papyrus surviving from antiquity, seems to be according to type of medication, with pills and lozenges preceding wet and dry plasters. Galen followed a similar pattern in the eighth book of his *De compositione medicamentorum secundum locos* (XIII 116-227 Kühn), in which first pills and lozenges, then plasters medicate stomach ailments and digestive disorders. The thirteen folios of the Michigan Medical Codex, written on both sides, were assigned the inventory designations 'A' and 'A verso' through 'M and M verso,' yet this alphabetical ranging implies nothing about the original ordering of the codex. Rather, its most likely order is I recto and verso, J recto and verso, L verso and recto, G recto and verso, H recto and verso, K recto and verso, M recto and verso, followed by A-F (below, page 64, note to lines 1ff.). Folio L represents the turning point in the codex, as the therapeutic methods turn from the pills and lozenges to the plasters (below, pages 72-76).

Hippocratic physicians were already collecting therapeutic recipes in the V century BCE. The treatise *Affections* (*Aff.*) assures us that the recipe collection upon which it was drawing had already achieved written form: 'If pain in the back or side is likewise present for this patient, give what has been written in the *Remedies* (*Pharmakitis/Pharmaka*) for

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[13]Cf. Ann Ellis Hanson (above, note 4).

pleuritic pain.'[14] Two of the large gynecological treatises, *Diseases of Women* I and *Diseases of Women* II (*Mul.* I-II) also advise medicaments from a collection entitled *Women's Remedies* (*Gynaikeia*), although the form in which the collection was circulating is not made clear: when treating uterine lesions, 'in the evening give her a thick potion and whatever is suitable to drink from the *Women's Remedies*'; when medicating a red flux, 'make up her bed with the foot-end higher and administer as a drink an acceptable prescription from the *Women's Remedies*.'[15] Although chronological markers are few in the recipe collections of the *Corpus*, the ones which are present suggest that collections were taking shape over a considerable period of time: in the case of *Diseases of Women* II, an apparent *terminus post quem* of about 600 BCE, the approximate date when one of its prescriptions achieved written form outside the *Corpus*, and a *terminus ante quem* of the mid-IV century BCE, the approximate date for the prescription named after the medical writer Philistion.[16]

The habit of naming a therapeutic medicament after the physician/pharmacologist from whose works it was taken, or with whom it was closely associated, becomes far more frequent in the recipe collections of the Roman period. Galen often assigns to prescriptions the names of earlier medical writers,[17] and a papyrus letter written in 58 CE from Charias to Dionysius, perhaps both of them doctors, with its reference to the 'plaster of Arcagathus,' amply demonstrates that this was a common way to designate a medicament.[18] Arcagathus is presumably the

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[14]*Pharmakitis* in Hipp. *Aff.* 9, VI 216.8-10 Littré; also 15, VI 224.10 Littré; 18, VI 228.4-5 Littré; 23, VI 234.22 Littré; 28, VI 240.9-10 Littré; 40, VI 250.11-12 Littré; *Pharmaka* in Hipp. *Aff.* 18, VI 226.9-10 Littré and 29, VI 240.21-22 Littré. The references suggest that the collection included analgesics, anti-febriles, and appropriate foodstuffs and potions.

[15]Hipp. *Mul.* I 64, VIII 132.22-24 Littré, and II 113, VIII 244.4-5 Littré; the references suggest the collection included appropriate potions.

[16]Hipp. *Mul.* II 113, VIII 244.9 Littré, and II 201, VIII 386.9-10 Littré, and cf. Ann Ellis Hanson, 'Therapies for Women's Diseases as Bearers of Meaning,' forthcoming in *Gender and History*. See also Hermann Grensemann, *Die knidische Medizin: Teil* I, Berlin 1975, 50, for the fact that Aeginetan weights and measures for ingredients in Hippocratic medicaments imply that the recipes achieved written form no later than about 480 BCE; recipes in both *Mul.* I and *Superfet.* occasionally employ Aeginetan measurements.

[17]*Passim* in Cajus Fabricius (above note 12).

[18]*P.Mert.* I 12; see discussion in Andorlini Marcone (above note 1), 462-63.

physician Pliny the Elder, following the annalist Cassius Hemina, described as 'the first Greek doctor at Rome' (*NH* XXIX 6 12-13), coming from the Peloponnese in the consulship of L. Aemilius Paullus and M. Livius Salinator (219 BCE).[19] What is unclear in the papyrus letter, and often elsewhere in the writers of pharmacology, is whether a recipe was taken directly from the writings of the earlier physician whose name is attached to it, or whether the recipe had been previously excerpted and inserted into some other recipe collection.

The Michigan Medical Codex participates fully in the practice of naming prescriptions after medical writers, citing recipes of Azanites (B 2, pages 13-14), of Dionysius (C 8, pages 22-23), of Heras (E 5, pages 36-40), of Telamon (E 9-15, pages 36 and 40-44), and of Hygienus (D 4, pages 28-30). It is, however, by no means clear whether the scribe has himself been asked to make a unique copy, gleaning recipes for plasters from works of previous writers, or, as seems more likely, whether he was simply copying an exemplar, itself ultimately dependent on a variety of sources. Only the 'plaster made from rue' (*peganera*) that 'is effective for spreading ulcers, wounds, abscesses, and lichen-like skin eruptions' is given a specific reference — 'from the second book of Dionysius.' But the prescription is unknown elsewhere, and the number of doctors named 'Dionysius' is large; Isabella Andorlini Marcone considers four as the more likely candidates on chronological grounds for having produced this *peganera* in the Michigan Medical Codex.[20]

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[19]Recent discussions of Arcagathus and his role in the arrival of Greek medicine at Rome: John Scarborough, 'Roman Medicine to Galen,' *Aufstieg und Niedergang der römischen Welt* 37.1, Wolfgang Haase, ed., Berlin - New York 1993, 22-25; Vivian Nutton, 'Roman Medicine: Tradition, Confrontation, Assimilation,' *Aufstieg und Niedergang der römischen Welt* 37.1, Wolfgang Haase, ed., Berlin - New York 1993, 53-58; Gabriele Marasco, 'L'introduction de la médecine grecque à Rome: une dissension politique et idéologique,' *Ancient Medicine in its Socio-Cultural Context* I, Ph.J. van der Eijk, H.F.J. Horstmanshoff, P.H. Schrijvers, edd., Amsterdam - Atlanta 1995, 35-45. For a new approach to the acculturation at Rome of Greek medicine and Greek practitioners, see Karin Nijhuis, 'Greek doctors and Roman patients: a medical anthropological approach,' *Ancient Medicine in its Socio-Cultural Context* I, Ph.J. van der Eijk, H.F.J. Horstmanshoff, P.H. Schrijvers, edd., Amsterdam - Atlanta 1995, 49-67.

[20]Andorlini Marcone (above note 1), 465-66 and note 12: (1) Dionysius, an anatomist and contemporary of Herophilus, who is perhaps mentioned in the papyrus *SB* VIII 9860 e.4; (2) Dionysius, an Empiric and contemporary of Heracleides of Tarentum; (3) Dionysius, a Methodist mentioned by Soranus and Galen; (4) Dionysius to whom the above-mentioned papyrus letter was sent (*P.Mert.* I 12, CE 58). Cf. also the larger

The best known of the early pharmacologists mentioned in the Michigan Medical Codex is Heras of Cappadocia, who practiced at Rome between ca. 20 BCE and 20 CE, and the author of the drug book *Narthex*.[21] Two numbered columns from a papyrus roll dated to the end of the III century CE, or the beginning of the IV, shows that Heras' work was still in circulation about the time the Michigan Medical Codex was copied. The roll presents an anonymous collection of medicinal prescriptions to prevent loss of hair (*P.Berl. Möller* 13), but its contents can be identified as from Heras' drug book, because Galen has quoted this first recipe against baldness at the beginning of his discussion of the topic in *De compositione medicamentorum secundum locos* I 2 (XII 430.8-431.5 Kühn), specifically attributing it to Heras 'in the *Narthex*.'[22] As Marie-Hélène Marganne has suggested, this prescription antedates Heras by nearly a century, for Heras was himself inspired by a quite similar recipe attributed to Heraclides of Tarentum by Criton, physician to Trajan (Galen, *De compositione medicamentorum secundum locos* I 2 XII 435.8-15 and 436.4-7 Kühn).[23] Galen's frequent citations from Heras show that he valued the work of this pharmacologist from a previous century, but whether he invariably knew Heras' work at first hand remains unclear.[24] Heras' name, however, was not copied by the scribe of the

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assemblage of doctors named Dionysius by Max Wellmann from which Andorlini Marcone was drawing - *RE* V 1, Stuttgart 1903, col. 978, s.v. 132 Dionysios.

[21]For Heras' dates, see Cajus Fabricius (above note 12), 183-85 and 242-246. For the Νάρθηξ and its other apparent titles, Galen, *Comp. per gen.* I 13, XIII 416, and the discussion in Fabricius, 183 and note 8. For Heras and a republication of the first column from a papyrus roll of Heras' *Narthex*, *P.Berl. Möller* 13 recto (= Pack^3 2382), see Marie-Hélène Marganne, 'Une étape dans la transmission d'une prescription médicale: P.Berl. Möller 13,' *Miscellanea papyrologica* (= *Papyrologica Florentina* VII), Rosario Pintaudi, ed., Florence 1980, 179-83. See also H. Gossens, *RE* VII 1, Stuttgart 1912, col. 529, s.v. 4 Ἥρας.

[22]This recipe enjoyed considerable popularity in antiquity, for it was known not only to Galen, but also with slight modifications to Dioscorides, pseudo-Galen, Oribasius, Alexander of Tralles, Paulus Aegineta, and Theophanes Nonnos (refs. in Marganne, above note 21, 182, notes 24-29).

[23]Cf. Cajus Fabricius (above note 12), 183-85, for another recipe Heras took from Heracleides (Galen, *Comp. sec. loc.* V 1, XII 812 Kühn) and for Galen's citations from Heras.

[24]In *Comp. per gen.* V 2, XIII 784.19-794.2 Kühn, Galen cites Heras' recipes for plasters, including a version of the plaster of Azanites that appears in the Michigan Medical Codex (B 2-14, pages 13-17); at least five of Heras' plasters, however, Galen derived from their citation by Criton, who reported them word for word. Galen went on to worry about apparent discrepancies in the quantities reported in the fourth plaster between what Heras gave and what Criton gave; Galen was able, however, to resolve most

Michigan Medical Codex at E 5, when he first wrote out his text, but 'of Heras' was later inserted before the opening rubric 'the grey plaster' by the physician-owner. As Mrs. Youtie notes, both the scribe and the physician-owner also failed to mention that Heras was the author of the 'parygron' which appears at A 6-13.

Like Dionysius and Heras, the names of Azanites, Hygienus, and Telamon also appear in Galen's drug books. Galen knew the plaster of Azanites that is contained in the Michigan Medical Codex (B 2-14, pages 13-17) apparently from its citation by Heras (*De compositione per genera* V 2, XIII 784.19-785.15 Kühn). The plaster of Hygienus[25] in the Michigan Medical Codex is otherwise unknown, but Galen also knew some of Hygienus' prescriptions at least through the agency of Heras. Galen says Heras deemed one of Hygienus' plasters 'the best in existence' (*De compositione per genera* II 3, XIII 511.4-513.6, and IV 14, XIII 747.11-748.18 Kühn). Telamon is the most shadowy pharmacologist mentioned in the Michigan Medical Codex, although he seems to have practiced at Rome in the middle of the I CE. Galen mentioned him only once by name and may well have learned of him only through the agency of Asclepiades Pharmakion (*De compositione per genera* II 14, XIII 524.2-529.5 Kühn).[26]

Although a product, then, of the IV century CE, the basic text of the Michigan Medical Codex was combining and taking its shape over considerable time. Although its physician-owner practiced his medicine at some distance up the Nile from Alexandria, this was no backward product from some deprived rural area. The work of famous Greek pharmacologists from an earlier time, practicing in Rome early in the I century CE, such as Heras, were available to the physician-owner, and his scribe incorporated a considerable number of their remedies and prescriptions. In addition, the habit of the physician-owner, whereby he squeezed into the copious bottom margins some twenty additional recipes on related topics, amply makes clear the means by which recipe catalogs

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of the discrepancies by converting various units of measurement so that the amounts could successfully be compared and harmony restored.

[25]For other references to Hygienus in Galen, see H. Gossens, *RE* IX 1, Stuttgart 1914, col. 97, s.v. Hygieinos; cf. Cajus Fabricius (above note 12), 244.

[26]Cf. Cajus Fabricius (above note 12), 192-98.

expanded. Collecting useful recipes and medicaments was an important activity for medical professionals, and the Michigan Medical Codex is the finest and most copious example we have of this activity, eminently demonstrating how widespread and long-enduring were some prescriptions that were associated with the pharmacologists and physicians of previous centuries. As a genre, the recipe catalog was inherently a very flexible entity, able to accommodate recipes excerpted from a number of other drug books, while, at the same time, preserving to a surprising degree the textual integrity of the individual recipes that comprised the catalog.

17 April 1996

THE MICHIGAN MEDICAL CODEX

(P.MICH.XVII 758 = P.Mich. inv. 21)

P.Mich. Inv. 21 was purchased in Egypt in 1920 and is of unknown provenance. It is dated in the Inventory prepared by A.S.Hunt to the fourth century A.D. It is composed of 13 papyrus fragments presumably from consecutive pages, although not necessarily in their present order. The six largest pieces, 21 A-F, are from the body of the text and preserve neither upper nor lower margins. The remaining seven fragments, 21 G-M, are smaller in size and come from the bottom inner corners of the codex.[1] In varying degrees they preserve the deep lower margin and the wide inner margin, including cord holes[2] and in one case, 21 J, a 9-10 cm. length of cord still in place. A smaller piece of ca. 2 cm. is caught between two horizontal holes in the preceding fragment, 21 I.

Our 13 fragments or leaves = 26 pages were possibly from a quire of 8 sheets = 16 leaves = 32 pages.[3] On the original size of our codex we can make a good estimate of its probable width as ca. 14 cm. This is based on the complete width of written surface in 21 A and D which is 9 cm, plus 2.5 cm.,the width of the inner margin to the holes in 21 E and G-M, plus an estimated outer margin of 2.5 cm. The probable height of our codex cannot be estimated with any certainty. The longest written surface is that of 21 A which is 11 cm. but the text is incomplete at both top and bottom. The lower margin is 4 cm. in 21 H-M, and the upper margin an estimated 2.5 cm. This gives us a minimum height of 17.5 cm. and a width of ca. 14 cm., or approximately 14 cm. x 18-20 cm.[4]

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1) These fragments can in no case be assigned to any of the upper portions of the codex.

2) See MPER N.S. XIII no. 19, Tafel 16, for a photograph showing the cord holes in a fragment from a medical (?) papyrus codex of the second century. For a more distinctive picture of cord holes and a style of writing not unlike that of our codex, see E.G.Turner, Greek Manuscripts of the Ancient World (Princeton, 1971), No.14, a late third century codex of the Iliad.

3) On the construction of a codex see E.G.Turner, The Typology of the Early Codex (U. of Penn. Press, 1977), pp.55ff. For a quire of 4 sheets = 8 leaves = 16 pages in a fourth century codex, see P.Ryl. I 28, introd. and Plate V. For a quire of "9 sheets (each 260 x 295 mm.) laid above each other, vertical fibres uppermost, and then folded to form a single quire of 18 leaves, 36 pages," see E.G.Turner, Greek Manuscripts, No. 14 (cf. preceding note). For a large quire of 52 sheets, similarly formed in an early third century codex. see The Chester Beatty Biblical Papyri, Fasc. III, Suppl., p.ix.

4) For codices of 13-15 cm. in width and 20-30 cm. in height see the list in E.G.Turner, Typology, pp.18-22.

The papyrus is medium brown in color and the ink is dark brown, almost black.[5] The scribe used a blunt pen and the resulting letters are thick and somewhat coarse. Slanting slightly to the right, they are without ligature and normally run to 18-23 letters per line. Alpha and delta often have a similar appearance, as also mu and nu; pi is made with two strokes, the second curving inward, so that it often resembles omicron. The letters are for the most part bilinear with the exception of ξ,ρ,υ,φ,ψ and occasionally τ which drop below the line. Abbreviations are infrequent: final nu at the end of a line is found as a short horizontal stroke above the preceding letter,[6] as in ξηρᾶ(ν) in 21 B v.12; and κοτ(ύλαι) is found in B v.11 with an oblique stroke through the bottom of tau. Symbols for drachms (ϛ), ounces (Γο), and pounds (↑) are employed throughout. Cf. Gal. XIX 750.[7]

Corrections and additions are entered above the line by the scribe and also by a second hand using very black ink. The second hand has further filled all of the lower margins of 21 G-M with additional material. This hand was in all likelihood that of the physician-owner of the codex. Writing cursively with a finer pen and employing much smaller letters and frequent abbreviations, he managed to attain as many as 8 lines of ca. 45 letters each and still keep a bottom margin of .5-1 cm.

Punctuation in the body of the text is effected by a blank space within a line, high points, paragraphoi, forked paragraphoi, a blank space of one line, and indention of lines. Marginal symbols are found only in the second hand in 21 A, 7; H, 8-10; M, 5-10. Cf. notes ad loc.

Our codex is almost entirely composed of medical recipes for plasters or poultices to be applied to wounds, ulcers of various kinds, carbuncles, herpes, erysipelas, ruptures of sinews or tendons, surgical incisions, fractures, etc. Additional recipes of the same type were added in the deep margins at the bottom of each page from 21 G-M and presumably also in the missing lower margins of 21 A-F. Our codex is reminiscent of the collections of recipes of the ancient medical writers and the further collections cited and used by those writers.[8] Cf., e.g., the thirty consecutive recipes for cicatrizing plasters in Galen XIII 524-534. The first twelve recipes he took from a collection of Asclepius which included recipes attributed by Asclepius to Marcellas, Euphranor, Attalos, Pamphilos, Telamon,[9] and Moschion. The

5) On the use of brown metallic inks beginning in the middle of the third century A.D. see E.G.Turner, Greek Manuscripts, p.22 and footnote 3.

6) For this abbreviation occurring in well-written literary works from the middle of the second century onward, see E.G.Turner, Greek Manuscripts, p.17.

7) Opera omnia, Vols. I-XX (Leipzig, 1821-1833), ed. C.G.Kühn.

8) For collections of medical recipes in papyri and ostraca see Pack² 2390-2433 (passim), Sammelbuch VIII 9860, P.Mich. Inv. 482 (Le Monde Grec, 555), MPER N.S. XIII (passim), P.Haun. III 47.

9) For the recipe of Telamon (?) in our codex see E, 9-15.

remaining eighteen recipes were taken by Galen from a collection of Andromachos, who incorporated recipes of Alcimion, Telephanes, and Pouplius among those of his own. In like manner our codex contains the parygron of Heras,[10] the Azanites recipe,[11] an unknown πηγανηρά (rue) plaster from the second book of Dionysius,[12] an unknown ἐπουλωτική plaster of the physician Hygienus,[13] a φαιά (grey) plaster of Heras,[14] and the ωλίνη (yellow) plaster of Telamon.[15]

Our codex was perhaps privately commissioned by the physician-owner who intended to collate it with its exemplar and to add further recipes from other collections which he had at his disposal.[16] The text contains errors on almost every page, some corrected by the scribe, some by the owner, and others left uncorrected. The errors are more numerous than would normally be allowable in a well-written text by a professional scribe.[17] But in spite of errors the text maintains the remarkable adherence to the traditional recipes which is characteristic of the medical texts on papyrus.[18]

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10) For this recipe see A, 6-13. The attribution to Heras was omitted as it was also in E, 5, where Ἡρᾶ was added by the second hand at the beginning of the line in the space left by the indention of the line.

11) See 21 B.

12) Only the title of the recipe is preserved in 21 C, 7, and apparently no "recipe with rue" attributed to Dionysius is to be found in any of the ancient medical writers.

13) For the known recipes of Hygienus see 21 D, note to line 4.

14) See 21 E, 5-8, with commentary.

15) See footnote 8. The identification of this recipe is not entirely certain. For the occurrence in papyri of known physicians prior to the second century A.D. see I.Andorlini, L'apporto dei papiri alla conoscenza dei medici pregalenici, Atti del XVII Congresso Internazionale di Papirologia, II (Napoli, 1984) 351-355.

16) On texts privately commissioned for working purposes see E.G.Turner, Greek Papyri: An Introduction (Princeton, 1968), p.96.

17) Cf. E.G.Turner, Greek Papyri, p.95

18) Cf. A.E.Hanson, Papyri of Medical Content, Yale Classical Studies, vol. 28, 1985, p.28.

P.Mich. Inv. 21 A 8.7 x 10.5 cm.

Plate 1a

- - - - - - - - - - - - - - - - - - - -

]...[

]..[.].ους [καὶ προς-]

[ἑχ]ων ἐν χρήσει λ[επτό]τα-

4 [το]ν ὀθόνιον. ποιῖ δὲ καὶ ἐπὶ

[ἑλκ]ῶν δαιμ[ο]νίως καὶ ἄλλω[ν].

[ἰάθη] γὰρ καὶ σώματ[α τῷ πα-]

[ρύγ]ρῳ λεγομένῳ μὴ καταφ[ρο-]

8 [νή]τῳ φαρμάκῳ στέατος ὑ-

[ε]ίου προσφάτου ὃ φᾶσιν ‹ἀξούγγιον› (δρ.) μ (τέταρτον)

[κ]ηροῦ λευκοῦ (δρ.) κ (τέταρτον) ψιμυθίου (δρ.) ς

[λι]θαργύρου (δρ.) ς τὰ τηκτὰ κ[α-]

12 [τ]ὰ τῶν ξηρ[ῶ]ν, χ[ρ]όνῳ δὲ συν-

[ίσ]τατε. αὕτη ἰᾶ[ται σ]ώματα

[καθ]άπερ ἴσων [ἄλλ]ων φα[ρ-]

[μάκ]ων ε.[

16]...[

]..[

- - - - - - - - - - - - - - - - - - - -

3. χρήσει 4. ποιεῖ 9,10. Pap. ᔑ , read δ 12. συνίσταται

Translation

... and, (when wanted) for use, apply the medication to a piece of finest linen. It works wonderfully for ulcers and other conditions. For the affected parts of the body are healed by the application of the so-called "parygron", a medication not to be despised. 44 drachms of fresh swine fat, that which they call "axunge", 24 dr. of white wax, 6 dr. of white lead, 6 dr. of litharge. The melted soluble ingredients are combined with the powdered dry ingredients; and, in time, the medication will take on consistency. This plaster heals the affected parts of the body just as other similar medications ...

2-4. For the illustrative restoration see Hipp., περὶ ἑλκῶν 4 (ed. Littré VI 404); Οὐ χρὴ οὐδ' ἐμπλάσσειν τὰ φάρμακα, πρὶν ἂν πάνυ ξηρὸν ποιήσῃς τὸ ἕλκος· τότε δὲ δεῖ προστιθέναι, ἀνασπογγίζειν δὲ τὸ ἕλκος πολλάκις σπόγγῳ, καὶ αὖθις ὀθόνιον ξηρὸν καὶ καθαρὸν προσίσχων (-ἔχων) πολλάκις. "No medicated plasters are to be used, until you have made the ulcer entirely dry; then one may apply them; the ulcer is to be frequently sponged clean, and in turn a dry clean piece of cloth is to be frequently applied to it."[19] For the verb ὑπο|τίν]ων (-τείν-) in place of προς|έχ]ων, cf. περὶ ἑλχῶν 11 (VI 410): ... ὀθόνιον ὑποτείνας λεπτὸν καθαρὸν οἴνῳ καὶ ἐλαίῳ τέγξας, "apply below a fine, clean piece of cloth moistened in wine and oil."

19) The translation is adapted from that of Francis Adams, The Genuine Works of Hippocrates, Baltimore, 1939, p.326.

But cf. also Aëtius XV[20] p.103,11 ποιεῖ ἐπὶ τῶν νευροτρώτων ἐν χρήσει ἡμῖν οὖσα. The spacing in our text could perhaps accommodate the reading:]. π[ο]ιοῦσ[α ἐπὶ νευρο|τρώτ]ων ἐν χρήσι κτλ., "... being effective in cases of persons wounded in the tendons; in using it, apply the medication to a piece of finest linen." If νευροτρώτων happens to be right, it would appear that the text on Inv. 21 A verso preceded that on A, and that the long title of A verso, 7ff., beginning ἔμμοτον ὑγρόν, introduced the parygron recipe of A.[21]

4. After ποιῖ the writing is almost completely obliterated, but the points of ink are more compatible with the suggested text, than the possible alternative ποιῖ δὲ καὶ|φλε[γ|μον]ῶν. But cf. the following note.

5ff. [ἑλκ]ῶν: For this restoration cf. Gal. XII 325,7 ... τὸ ὕειον καὶ διὰ τοῦτο μίγνυται καὶ τοῖς ἕλκη θεραπεύουσι φαρμάκοις, οἷόν πέρ ἐστι καὶ τὸ καλούμενον πάρυγρον, "... when pig fat in like manner is mixed with medicaments which heal ulcers, the remedy called parygron is of such a kind." Cf. also XIII 399,15. In XVIII B 598,10,[22] the third treatise of Hippocrates on fractures, is the following: τὰ γὰρ ἀφλέγμαντα καὶ παρηγορικὰ φάρμακα, καθάπερ ἐστὶ τό τε πάρυγρον ὀνομαζόμενα ἥ τε τετραφάρμακος δύναμις, ἀφλέγμαντον μὲν φυλάττει τὸ πεπονθὸς μέρος, δυπαρὸν δὲ ἐργάζεται τὸ ἕλκος. "For the medicaments which check inflammation and are soothing, such as those called the parygron and the tetrapharmacon, protect the affected part from inflammation and are effective against the putrid ulcer." Cf. also Aët. XV, pp. 46,16; 126-7. Paulus Aegineta[23] IV 4.2 has εἰ δὲ ἑλκωθείη τὰ μέρη, χρῆσθαι παρύγρῳ ⟨ἢ⟩ τῷ διὰ πομφόλυγος καλουμένῳ.[24] "If the parts are ulcerated, use the parygron or the plaster called that with pompholyx." Cf. Gal. XIII 952 and Aët. XV, p.80, where our recipe is paralleled, for use of the parygron to heal minor inflammations (βραχείας φλεγμονάς). In his repetition of the parygron of Heras among his αἱ λευκαὶ ἔμπλαστροι, taken from the ἐπουλωτικαὶ Ἀνδρομάχου (XIII 532-3), Galen says of it: ἄλλη πρὸς ἕρπητας, ἄνθρακας,[25] κονδυλώματα, ῥαγάδας, ἀφλέγμαντος ἄγαν, ὡς Ἡρᾶς ὁ Καππάδοξ. "It is another medication for herpes, carbuncles, callouses, and cracks of the skin, and it

20) Aëtius Amidenus I-VIII, CMG VIII (Leipzig, 1935-1950) ed. A.Olivieri; XV, Athena 21 (1909) 3-144, ed. S.Zerbos.

21) Cf. A verso, 9-10 προς ... νεύρων δ[ι]ακοπάς. Cf. also A verso, 10-11 δυπαρὰ ἕλκη and A, 4-5 ἐπὶ [ἑλκ]ῶν.

22) I owe this reference, with many thanks, to Prof. J.Arthur Hanson who sent me a list of all the references for the word πάρυγρον which are to be found in the computerized books of Galen available at Princeton. They are: II 703, XII 325, 467, XIII 399, 455, 951-2, 959, XVIII B 598.

23) CMG IX (Leipzig, 1921-1924) ed. I.L.Heiberg.

24) ἥ is omitted in the printed text, but the app.crit. gives the MS evidence: τῷ D; ἢ τῷ ABEHM; ἢ τὸ (= τῷ) FGK. Cf. Orib.Eupor. IV 124 τὸ πάνυγρον (= πάρ-), 130 τὸ διὰ πομφόλυγος. And cf. H verso, 6 in our codex.

25) For ἕρπητας ἄνθρακας see A verso, 8, and cf. note to lines 2-4, above, ad fin.

very much reduces inflammation, according to Heras the Cappadocian."

Another of the parygron parallel texts, Aët. XV, p.127, is called ἄλλη παρηγορητικὴ[26] Ὀριβασίου πρὸς τὰ αὐτόματα ἕλκη καὶ τοὺς τρυφερόχρωτας, "another soothing medication of Oribasius for spontaneous sores and tender skin."[27] After the ingredients is the following: ποιεῖ καὶ πρὸς ἕρπητας καὶ πρὸς τὰ ἐν μήτρᾳ καὶ δακτυλίῳ ἀνιεμένη ῥοδίνῳ, καὶ πρὸς τὰ κακοήθη ἐν προσώπῳ ψυδράκια. "It is effective against herpes and ulcers in the womb and anus, when diluted with rose oil, and against virulent pustules on the face."[28] The recipe in Paul. VII 17.27 is called πάρυγρον Ὀριβασίου. It differs from the others in that it adds three more ingredients,[29] which may account for the cautionary admonition: θαυμασίως ποιεῖ πρὸς πτερνῶν ῥαγάδας, ἐπὶ ἑλκῶν δέ, φησί, φυλάσσου· δυσῶδες γὰρ ἀποτελεῖται, "it works wonderfully for cracks of the heels, but for ulcers, he says, be careful, for the medication will turn rancid in time."

5. δαιμ[ο]νίως: for other plasters of Heras which are described as ποιεῖ δαιμονίως, cf. Gal. XIII 547,15; 786,12.

καὶ ἄλλω[ν]: sc. διαθέσεων. Cf. Aët. XV, p.60,15 ποιεῖ καὶ πρὸς ἐρυσιπέλατα καὶ ἄλλας πλείστας διαθέσεις.

6. A horizontal break through this line has caused considerable loss and damage, so that the only securely read letters are γ and ρ. The line could not have been read, nor indeed parts of lines 12-15, without the parallel text of Gal. XIII 951-53, where the parygron of Heras is described at length.

[ἰάθη] γὰρ καὶ σ̣ώ̣μ̣α̣τ̣[α: Galen has (952,3) ἰᾶται γὰρ τοῦτο βραχεῖαν ἔτι φλεγμονὴν ἔχον τὸ μόριον, οὐ μετὰ πολὺν χρόνον τῆς σκευασίας, ἀλλ' εὐθέως ἐπιτιθέμενον. "For this remedy heals the portion of the body which has a minor inflammation, not after a long time of preparation, but immediately upon application."

6-7. τῷ παρύγ]ρῳ λεγομένῳ: The name of the plaster is guaranteed by the four ingredients of the recipe which appear also in Gal. XIII 953 in the same order and with the same amounts, but in ounces instead of drachms, and with the same concluding direction. See the Table of Ingredients and Amounts at the end of the commentary. The name is found both as τὸ πάρυγρον and ἡ πάρυγρος. Occasionally, τὸ πάνυγρον and ἡ πάνυγρος are found in error for πάρυγρον, πάρυγρος. In Orib.Eupor. IV 124 (= V 786) is the title τὸ πάνυγρον,

26) Of six MSS four have παρηγορητική or variant, one has πάρυγρος and the last, πάνυγρος. For the ingredients and amounts as those of the parygron, see the Table at the end of the commentary.

27) Orib. Fr. 102 (= IV 615, 15-16 in Oribasius, Oeuvres I-VI [Paris, 1851-1876] ed. Bussemaker and Daremberg) has the following: πρὸς τὰ αὐτόματα. λευκὴ πάρυγρος πρὸς τοὺς τρυφερόχρωτας.

28) Orib. Fr. 102: ποιεῖ ἐπὶ γυναικείων σωμάτων καὶ πρὸς ἕρπητας· ἔστι δὲ καὶ δακτυλικὴ ἀνεθεῖσα καὶ πρὸς τὰ περὶ μήτραν, ἔτι δὲ πρὸς χιμέθλας κακοήθεις καὶ τὰ περὶ πρόσωπον ψυδράκια.

29) 9 oz. of resin, 10 oz. each of linseed juice and oil.

but the ingredients and amounts and direction are exactly the same as in the parygron recipe of Galen XIII 953. In Orib.Fr. 102 (= IV 615,15) the recipe is called λευκὴ πάρυγρος.

In Aët. XV, p.80, the parallel parygron recipe is entitled ἡ πάρυγρος, with no conflicting variants in the MSS. But p.46 has a recipe called ἡ δι' ὑδρελαίου, at the end of which is the following: τοῦτο μὲν οὖν ἕλκεσιν ἁρμόττει, ἐφ' ὧν ἡ πάνυγρος ὀνομαζομένη καὶ αἱ (read τὰ) παραπλήσια (sc. φάρμακα), with the evidence of the MSS given as πάνυγρος VW, πάρυγρος BΦ. Since the recipe is composed of 1 lb. of litharge and 2 lbs. each of oil and water, there is reason for it to be called a panygros, a quite moist medication, rather than a parygros, a somewhat moist medication. This is true also of the recipe on p.126, entitled τὸ πάνυγρον Γαληνοῦ, ἄλλως τὸ παρήγορον καλούμενον.[30] The recipe was taken from Gal. XIII 424-5 where the same ingredients with the same amounts are found, and the words παρηγορικόν and ἀνώδυνον are used to describe it. It is quite different from the parygron: there is no wax; and pig fat, the largest item in the parygron, is here the smallest = one-half part; there is one part each of white lead and litharge; and two parts each of oil and water.

7-8. μὴ καταφ[ρονή]τῳ φαρμάκῳ: "a medication not to be despised." The adjective is seemingly quite infrequent (cf. LSJ, s.v.). The verb is used by Alexander Trallianus (II 349)[31] in connection with a recipe: ἰσχυρόν ἐστι τὸ βοήθημα· καὶ μὴ καταφρονήσῃς διὰ τὸ εὐτελὲς τῶν εἰδῶν, "it is a powerful remedy, and you should not despise it because of the cheapness of its ingredients." Cf. Aët. XV, p.98, where another recipe for a plaster, which contains only litharge, arsenic, and oil, is concluded by the following: αὕτη πάνυ καλή καὶ μὴ καταφρόνει τῆς εὐτελείας. "This is an altogether excellent application. Do not despise it because of its inexpensiveness."

8-9. στέατος ὑ̇[ε]ίου προσφάτου ὃ φᾶσιν ‹ἀξούγγιον›: the other parygron recipes have στέατος προσφάτου ὑείου ἐξινιασμένου (fibreless) Gal. XIII 953, Aët. XV, p.80, Orib.Eupor. IV 124; c.ὑ.π. Gal. XIII 532; πιμελῆς ὑείας προσφάτου Orib.Fr. 102; π. χοιρείας πρ. Aët. XV, p.127; λίπους ὑείου Paul. VII 17.27.

‹ἀξούγγιον› = Lat. axungia, animal fat, usually pig fat (cf. the New Oxford Latin Dictionary, s.v.), often spelled ὀξύγγιον in Dsc., Orib., and Paul.[32] In a recipe for a plaster of Galen, called ἡ φοινικίνη[33] for cicatrizing ulcers, a recipe similar to the parygron except for the omission of wax, the

30) Prof. J.Arthur Hanson has checked the computerized books of Galen, available at Princeton, and found no example of πάνυγρον, -ος.

31) Opera, vols. I-II (Amsterdam, 1963) ed. Th.Puschmann.

32) E.g., Dsc. III 90; Dsc.Eupor. I 145, 173, 215, et al.; Orib. Fr. 97; Paul. VII 17.9, 20, 21, et al. (but one MS, R, has the spelling ὀξούγγιον throughout).

33) Gal. XIII 375ff.; 391,12. See also F, 10 in our codex.

fat is described as follows: τοῦ παλαιοῦ στέατος ὃ καλοῦσιν ἀξούγγιον οἱ πιπράσκοντες ἔστωσαν λίτραι β, "2 lbs. of old fat: let it be that which those selling it call axunge" (378,4). In a repetition of the recipe (391,12) he repeats the description: καὶ δύο τοῦ παλαιοῦ στέατος, ὃ καλεῖν ἔφην τοὺς πιπράσκοντας ἀξούγγιον. He had earlier (376) specified that the στέαρ was τῶν ὠῶν, and χρὴ δὲ τὸ στέαρ ἄναλόν τε καὶ ὡς ἔνι μάλιστα παλαιότατον εἶναι, "the fat must be unsalted and especially it is to be as old as possible."[34)]

Most of the instances of the word ἀξούγγιον in the recipes of Dioscorides, Galen, Aëtius and Paulus are without modification, or with παλαιόν only. But two recipes in Aët. XV. p.88,13 and 102,4 require ἀξουγγίου νεαροῦ, which is the equivalent of our προσφάτου. A closer parallel is found in a recipe for a plaster of Damocrates (taken from a collection by Menecrates) which was put into metre for easy memory: Τοῦ λιπαροῦ καὶ προσφάτου ἀξουγγίου, Ἐννέα δὲ τοῦ χειμῶνος, ὥς φησιν, βάλεις (Gal. XIII 1002, 6-7), "but in winter, as he said, add nine pounds of oily, fresh axunge."

8-11. For a discussion of white plasters, those containing white wax, litharge, and white lead, see Gal. XIII 409ff.; on the various kinds of wax, 411; on the addition of fat, 424ff. For a comparison of the amounts of the ingredients in our text with those in the parallel texts, see the Table at the end of the commentary. In general, the amounts of the two metals are the same; the amount of wax is four times that of the metals; and the amount of fat is nearly double that of the wax.

9. (δρ.) μ (τέταρτον): Our scribe was indeed careless in writing this line. Not only did he omit the word ἀξούγγιον, but he wrote the symbol for one-fourth in place of four. (See the app.crit.) The Table of Ingredients and Amounts shows clearly that (δρ.) μδ is required here.

10. [κ]ηροῦ λευκοῦ: Of the parallel recipes in the Table, the two Galen texts are the only ones which specify white wax.

(δρ.) κ (τέταρτον): (δρ.) κδ is required here. Cf. note to line 9. δ and the symbol for τέταρτον are easily confused.

ψιμιθίου: this is the regular papyrus spelling for ψιμυθίου. Cf. M.-H. Marganne, Inventaire Analytique des Papyrus Grecs de Médecine, p.373, s.v. ψιμύθιον, where only one of the eight references, P.Ryl. I 29a,41, is given the restored spelling ψ[ιμυθ]ίου. But see now MPER N.S. XIII, Index, p.56: of the 3 references there given, one has the spelling ψιμυθίου (No. 6, 9; Tafel 4).

11ff. τὰ τηκτὰ κ[ατ]ὰ τῶν ξηρ[ῶ]ν: "add the melted ingredients to the dried, powdered ingredients." See 21 B verso, 12 and note ad loc. But the direction in A adds three more words, χ[ρ]ό̣ν̣ῳ̣ δὲ συν[ίς]τατε (read -ται),

34) For the same φοινικίνη recipe, Paul. VII 17.29 has ὀξυγγίου παλαιοῦ; Orib.Syn. III 5 has χοιρείου παλαιοῦ καὶ ἀνάλου στέατος; while Aët. XV, p.44 has the same but adds τετηκότος (already melted). In the directions, however, the item is referred to as τοῦ ὀξυγγίου.

"and allow to stand for a time."[35] The three words could not have been read without the parallel in Gal. XIII 953, which has the same direction. It is also repeated in exactly the same form in Orib.Eupor. IV 124. Orib.Fr. 102 has simply τὰ τηκτὰ κατὰ τῶν ξηρῶν; Aët. XV, p.127 has τὰ τηκτὰ ἀναμίγνυε κατὰ τῶν ξηρῶν. While Aët. XV, p.80 has an expanded form: τὰ τηκτὰ μετὰ τῶν ξηρῶν ἀνάμιγε, ὑγρότερα δὲ μένει ἐπὶ χρόνον τινὰ καὶ οὕτω κατὰ βραχὺ τὴν σύστασιν λαμβάνει. "Mix together the melted ingredients with the dried ingredients. It will remain quite watery for a time but will shortly take on consistency."

13. αὕτη ἱᾶ[ται c]ώματα: the text may have had ἱᾶ[τε = ἱᾶται, since the space of the lacuna, in the line above, is occupied by 3 letters, [ρ]ον. Cf. 12-13, συν[ίc]τατε = συνίσταται.

13-16. For the restoration cf. Gal. XIII 399-400 πρόδηλον δ' ὅτι κνήσμασι καὶ ἀποσύρμασι καὶ συνελόντι φάναι μικροῖς ἕλκεσιν ἁρμόττει τὸ τοιοῦτον φάρμακον, ἐφ' ὧν καὶ ἡ πάρυγρος ὀνομαζομένη κηρωτὴ καὶ ἄλλαι τινὲς ὅμοιαι χρησιμώτεραι τῶν ἰσχυρὰν δύναμιν ἐχόντων εἰσὶν, ὁποῖα τοῖς μεγάλοις τραύμασιν ἐπιτίθεμεν. "It is clear that such a medication is suitable for bites and abrasions and, in a word, minor wounds. Among such medications are the cerate called parygros and some other similar preparations which are more useful than those having a strong curative property, such as the kind we apply to large wounds."

Table of Ingredients and Amounts

	Mich. Inv. 21 A	Gal. XIII 953	Gal. XIII 532	Orib. Eup.IV 124	Orib. Fr. 102	Aët. XV p.80	Aët. XV p.127	Paul. VII 17,27
pig fat	44 dr.[36]	44	88 dr.	44[38]	11	44	11	7
wax	24 dr.[37]	24	48 dr.	24	6	24	6	4
white lead	6 dr.	6	12 dr.	6	1½	6	1½	1½
litharge	6 dr.	6	12 dr.	6	1½	6	1½	1½

The amounts are in ounces except where otherwise stated. Orib. Fr. 90,32 called ἕτερον πάρυγρον, and the last recipe in Fr. 90, called simply πάρυγρος, are omitted because they are both more properly πάνυγροι. Cf. note to lines 6-7, above.

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35) "Stand together" is the basic meaning of συνίστημι but see LSJ, s.v., V, for the meanings "make firm, contract, condense," i.e., in a medicated plaster, "take on consistency."

36) See the note to line 9, above.

37) See the note to line 10, above.

38) The printed text has κδ = 24, a typographical error for μδ = 44, as shown by the Latin translation "quadraginta quattuor" at the foot of the page. The edition has no app.crit. for comparison of MSS readings.

Inv. 21 A verso 8.7 x 10.5 cm.

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]τα....[Plate 1b

]... καὶ τὴν λιθ[άρ-]

γυρον [c]υνενώccας ἐπ' οἶν[ον]

4 ἐν κα[θαρ]ᾷ πυξείδη ·

ἔμμοτα φάρμακα

ποιεῖ ἄκα πρὸς ἕλκη

) ἔμμοτον ὑγρὸν πρὸς νο-

8 μὰς ἕρπη[τ]ας ἄνθρακας

ἐρυcιπέλατα [κ]αὶ νεύρων δ[ι-]

ακοπὰς [τὰ] παλαιὰ δυπα-

ρὰ ἕλκ[η ὁc]τέα χόνδρου

12 πελι[δνὰ κόλ]πους κατ[άγματα]

]...[

- - - - - - - - - - - - - - - - -

3. cυνενώcας 4. πυξίδι 6. ποιεῖ ἄκη

Translation

... having mixed together the ... and the litharge with wine, (store it) in a clean casket.

Medications on lint pledgets: the remedies are effective against ulcers.

A moist tented application for spreading-ulcers, herpes, carbuncles, erysipelas, ruptures of tendons, long-standing foul ulcers, bones bare of cartilage, fistulous ulcers, fractures, ...

3. [c]υνενώccας(-ώcας)ἐπ' οἶν[ον]: cf. 21 C, 4-6, ὅταν ἐνωθῇ ἐπ[ίβαλλε τὸ]ν χυλὸν καὶ τὰ τηκ[τὰ cυνεν]ώcας χρῶ.

4. πυξείδη = πυξίδι. Cf. δίζζης = δίζης in E verso, 5. For η in place of ι, cf. Mayser-Schmoll, I i, 52f.; Gignac, I 235ff. A pyxis, originally a box made of boxwood, then of any wood, became a receptacle for holding medicines, cosmetics, etc., especially when made of metal. Cf. the references in LSJ, s.v. πυξίc,[39] and in the new Oxford Latin Dictionary, s.v. pyxis. Our scribe has omitted a main verb, e.g., καὶ ἀπόθου before ἐν κα[θαρ]ᾷ πυξείδη.[40] Dsc. III 11.2 has ἀποτίθεcθαι δὲ δεῖ τὸ φάρμακον εἰc χαλκῆν πυξίδα, "one must store the medicine in a bronze box." At the end of one of the thirty recipes for cicatrizing-plasters, mentioned in the Introduction and B verso, note to lines 8-11, is the following (Gal. XIII 529): καὶ ἀνελόμενοι εἰc μολυβδίνην πυξίδα χρῆcθε καθάπερ προείρηται, "having placed it in a leaden

39) To the two references for the word in papyri, add BGU VI 1300, 8; and, in a medical text, P.Haun. III 47, 13 πυξίδα χαλκῆν (ed. pr. ...ιδα χαλκῆν). I owe a computer printout of all the references to πυξίc in Gal. XII-XIV to Prof. Ann Ellis Hanson.

40) For other scribal omissions in our codex see A, 9; B, 2, 12, 13; et al. Cf. also Introduction, ad fin.

container, use as previously directed." In XIV 409, 1-2, one of the common home remedies for untoward eye conditions is the following: ἄλλο· ἐκ τοῦ πηγάνου προσφάτου χυλὸν ἐκπιέσας τίθετι ἐν τῇ πυξίδι τοῦ χαλκοῦ ἐρύθρου καὶ χρῶ. "Another remedy: express the juice from fresh-picked rue and store it in a recepticle of red copper."

The writer of the codex placed a large dot after πυξίδη to mark the end of the recipe. In addition he placed a broken line beneath line 4, which he extruded into the margin. Then, after leaving a blank space of one line, he indented the two following lines by 4 letter-spaces to mark them off as a general title for the next section.

5. ἔμμοτα φάρμακα: medications treated with tents or tampons for dressing wounds. Cf. Gal. XI 125,15 εἶναι δὲ χρὴ τὰ τηκόμενα φάρμακα δριμύτερα τῶν ἐμμότων ὀνομαζομένων, "it is necessary for dissolved and very pungent drugs to be upon so-called pledgets." Paul. IV 40.3 δυπαρώτερον δὲ ποσῶς, τά τε κεφαλικὰ προσαγορευόμενα ξηρία, ἔμμοτα δὲ φάρμακα ἥ τε Τροφός ἐστι καλουμένη καὶ ἡ Ἴσις καὶ ἡ Ἀθηνᾶ, "when the ulcers are more foul the powders called cephalic are to be applied and the medications upon pledgets, the so-called Trophos, the Isis, and the Athena."

6. ἄκα = ἄκη. For the comparatively rare interchange of η and α, cf. Mayser-Schmoll, I i, 54.

πρὸς ἕλκη: for wounds, ulcers, or sores. Cf. Hipp. περὶ ἑλκῶν (ed. Littré, vol. VI 400-432). In the thirteen fragments of our codex, nine of the texts mention ἕλκη. Cf. note to A, 5ff.

7, margin. On the edge of the papyrus opposite this line is a very black curved stroke, not an antisigma, in the second hand. It was undoubtedly intended to draw attention to the first recipe in the new section. For marginal symbols in this codex see H, 8-10 and M, 5-10.

7. ἔμμοτον ὑγρόν: sc. φάρμακον. "A moist medication upon pledgets" is the beginning of the title of the next recipe which continues beyond the broken-off bottom of the text.[41] For an ἔμμοτος καλλίστη ὑγρά, sc. ἔμπλαστρος, cf. Dsc. Eupor. I 173. Cf. also D, 10 of our codex, ἐφθὴ ἔμμοτος, sc. ἔμπλαστρος, "a refined tented plaster."

πρὸς νομὰς κτλ.: There are many recipes in the works of the medical writers for plasters which are suitable for a number of various types of ulcers and ulcerous conditions. Cf. Gal. XIII 766,15 πανάκεια Ἡρᾶ ... πρὸς πᾶσαν νομὴν καὶ κακοήθειαν, "the panacea of Heras against every kind of spreading and malignant ulcer;" 836,17 πρὸς νομὰς, σύριγγας, πτερύγια, ... ἕρπητας, ἐρυσιπέλατα καὶ ἄλλα, "for spreading ulcers, abscesses, fleshy excrescences, herpes, erysipelas, and other conditions;" Aët. XV, p. 110.23 μάλιστα ἐπὶ τῶν χρονιωτάτων καὶ δυσεπουλώτων καὶ σηπεδονωδῶν καὶ νομωδῶν ἑλκῶν, "especially for the oldest, hard to cicatrize, septic, and spreading ulcers." Cf. also Paul. IV 43.3; 44.1-5.

41) Cf. A, note to lines 2-4, ad fin., for the suggestion that A verso preceded A in the codex.

8-9. Herpes, often called shingles, is characterized by painful inflamed clusters of small pustules and is frequently found in conjunction with ἄνθρακες and ἐρυσίπελας. The former are carbuncles or malignant pustules, caused by inflamed subcutaneous tissues, often occurring on the neck. The latter, erysipelas, is an acute, painful inflammation of the skin and mucuous membranes; on this disease see Celsus, Loeb ed., vol. III, p. 590. For ἄνθρακες see Gal. XIII 854ff. For all three conditions, cf. a cerate-recipe in Gal. XI 439,11: καὶ σοι τοῦτο πρὸς ἐρυσιπέλατα καὶ φλεγμονὰς ἕρπητάς τε καὶ ἄνθρακας ἀγαθὸν ἔσται φάρμακον. Cf. also VII 719; XIII 533, 694, 835-7; Dsc. Eupor. I 160, 161; Orib. Syn. VII 12, 32, 33; Paul. IV 20, 21, 25. For papyri cf. PSI X 1180, 56-57, πρὸς ἐρυσιπέλ(ατα[42]) μεθ' ὕδατος, πρὸς ἑρπητικὰ μετ' οἴνου Αἰγυπτίου.

9-10. νεύρων δ[ι]ακοπάς: ruptures of tendons. Cf. Gal. XIII 645, 15 κιρρὰ ἡ τοῦ 'Αλιέως· ποιεῖ πρὸς τὰ ἔναιμα τῶν τραυμάτων καὶ νεύρων διακοπάς· ποιεῖ δὲ καὶ πρὸς τὰ παλαιὰ καὶ δυσεπούλωτα καὶ βευματικὰ τῶν ἑλκῶν, "the yellow plaster of Halieus: it works for the bloodclots of wounds and ruptures of tendons; it is effective against old, hard to cicatrize, and discharging ulcers;"[43] XIII 778, 11 ἱερὰ ἡ ἐκ τοῦ ἐν Μέμφει 'Ηφαιστείου· ποιεῖ ἐπὶ προσφάτων ἐναίμων, βευματικῶν, πρὸς νεύρων διακοπάς, παλαιὰ ἕλκη, ..., σηπεδόνας, ἄνθρακας, "the sacred plaster from the Hephaesteion in Memphis: it is good for fresh bleeding, discharges, for ruptured tendons, long-standing ulcers, septic ulcers, carbuncles."

10-11. βυπαρὰ ἕλκ[η: foul or filthy wounds or ulcers. Cf. Gal. XII 682-3, ποιεῖ δὲ καὶ πρὸς νομὰς καὶ σηπεδόνας ἐπιπασσομένη καὶ πρὸς τὰ βυπαρὰ ἕλκη, ἐν μοτῷ μετὰ μέλιτος. "The remedy is effective against spreading and septic ulcers when sprinkled on, and against foul ulcers when applied on a lint pledget with honey." Aët. XV, p. 39.9 αὕτη κολλᾶν τραύματα μεγάλα δύναται καὶ τὰ βυπαρὰ ἕλκη ἀνακαθαίρειν καὶ τὰ παχύτερα τῶν ἑλκῶν ἰᾶσθαι καὶ προστέλλειν κόλπους καὶ ὅλως διαφορεῖν καὶ ἀποκρούεσθαι δύναται. "This remedy is able to agglutinize large wounds, to thoroughly clean filthy ulcers, to heal massive ulcerations, and to draw in, disperse, and wholly drive out fistulous ulcers." Cf. also Paul. III 79,6 πρὸς τὰ ἐν τῷ πέλματι βυπαρὰ ἕλκη ἔμμοτον; IV 41 ἀνακαθαρκικὰ βυπαρῶν ἑλκῶν; VII 17.40 ἡ 'Αθηνᾶ πρὸς ἕλκη βυπαρά κτλ.

11-12. ὀσ]τέα χόνδρου πελι[δνά: "bones bare of cartilage" are "exposed bones", due to wounds or other physical damage. Cf. Aët. XV, p. 41,5, "the highly esteemed and very useful plaster of Machaerion": ποιεῖ καὶ πρὸς νομάς ... ἐπί τε τῶν ἐψιλωμένων ὀστῶν σάρκας αὔξουσα, "it is good for spreading ulcers, ... and for bones laid bare, by encouraging growth of flesh." Cf.

42) Ed.pr. ἐρυσίπελ(ας). In the medical writers the word is usually found in the plural.

43) Aët. XV, p.48, has the same recipe of Halieus.

also Gal. XIII 557, "the Barbaros plaster of Heras": ... πρὸς σύριγγας, κόλπους, κατάγματα, ... ποιεῖ καὶ ἐπὶ νεύρων καὶ χόνδρων διακεκομμένων καὶ ὀστῶν, "for abscesses, fistulous ulcers, and fractures, ... it is effective also for ruptures of tendons, cartilage, and bones."[44)]

12. κόλ]πους: fistulous ulcers which spread under the skin. Cf. Gal. XI 125 for a definition. The word is found again in our codex in B,6 and B verso, 4.

κατ[άγματα: For this word following κόλπους see note to lines 11-12, above. For its occurrence in papyri see Marganne, Inventaire Analytique, p.214. It may occur again in our codex in H verso, 5.

P.Mich. Inv. 21 B 7 x 8.7 cm.

Plate 2a

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].μενων .[

[.. ἔχει δ]ὲ ὁ ‹Ἀ›ζανίτης [οὕτως·]
[ποιῖ δὲ καὶ] πρὸς τ[ὰ] κ[ακοήθη]
4 [πάντα. ἐς]τιν δὲ καὶ ἐνδ[οξον]
[ἐπιτιθ]έμενον. ποιῖ δὲ κα[ὶ πρὸς]
[κόλπ]ους ἀπὸ λιθοτομίας [τῆς δια-]
[τμ]ηθέντος καὶ ἐπὶ μεγ[άλων]
8 [ἐ]πιδιερέσεων ἐκ δω[γμῶν]
[π]ίσσης (οὐγ.) α κηροῦ ὑ[σύπου]
[ἀν]ὰ (οὐγ.) γ στέατος ὗ[ίου καὶ]
[ταυ]ρίου ἀνὰ (οὐγ.) ς πε[υκίνης]
12 [(οὐγ.) ε ὅτ]αν δὲ ‹ᾖ› π‹ρὸς› ἕλκη [πλίονι χρῶ]
[φαρμάκ]ῳ ‹ἔ›λα[ττον πρὸς ἐπού-]
[λωσιν

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3,5. ποιεῖ 8. ἐπιδιαιρέσεων 9. οἰσύπου 10. ὑείου 11. ταυρείου 12. πλείονι

Translation

Azanites has the following: It works for all malignant sores; it is a highly esteemed application. It is effective against fistulous ulcers resulting from the surgical incision made in a lithotomy, and against those ulcers resulting from multiple incisions of great length in operations for fractures. 1 oz. of pitch, 3 oz. each of wax and oesypum (grease of sheep's wool), 6 oz. each of pig-fat and bull-fat, 5 oz. of pine-resin. When it is for ulcers, use more of the medication; when it is for cicatrizing, less.

2. ‹Ἀ›ζανίτης: For omission of other letters in this text see lines 12-13. See also omission of letters or words in A, 9; B verso, 8; D, 4, 12, 13 note;

44) Aët. XV, p.53, has the same Barbaros plaster of Heras. I am grateful to Ann Ellis Hanson for sending me a computer printout of all the references for the word χόνδρος from the whole of Galen.

E verso, 11; et al.

2-4. The supplements are illustrative, but the traces of ink fit the restored letters. Galen, XIII 784-5, has ἡ τοῦ Ἀζανίτου πολύχρηστός ἐστι καὶ ἔνδοξος. περὶ αὐτῆς δὲ γράφει ὁ Ἡρᾶς οὕτως· ἡ τοῦ Ἀζανίτου, κτλ. "The plaster of Azanites has many uses and is highly esteemed. Concerning it Heras writes thus: 'The plaster of Azanites, etc.'" Aëtius XV, p. 123, has ἡ τοῦ Ἀνανίου (Ἀζανίτου, Ἀζανίου)[45] πολύχρηστός τε καὶ ἔνδοξος. Paulus VII 19.6 has only τὸ τοῦ Ἀζανίτου (sc. φάρμακον), or ἄκοπον from the heading of Chap. 19, "a relieving application"); and Oribasius, Frag. 90, ἡ τοῦ Ἀζανίτου (sc. ἔμπλαστρος).

3ff. Both Galen (785) and Aëtius (p. 123) have the following, with unimportant variations: ποιεῖ πρὸς τὰ κακοήθη πάντα, γαγγραίνας, σύριγγας, πρόσφατα τραύματα, πυρίκαυτα, περιψυγμούς, ... καὶ πρὸς τὰ ἐν ὑστέρᾳ ἕλκη, φύματα, παρωτίδας, ... μάλιστα δὲ ποιεῖ ἐφ' ὧν ἡ πληγὴ περὶ τὰ νεῦρα ἢ μῦν ἐστι καὶ ἐπὶ κακοήθων. "The medication is effective in all cases of malignant sores, gangrene, abscesses, fresh wounds, ulcers caused by fire or by frost, ... and for ulcers in the womb, tumors in general, and parotid tumors, ... It works especially well in cases where there is a wound[46] of the tendons or a muscle, and it is good in cases of malignant ulcers."

5. [ἐπιτιθ]έμενον: Galen has (785, 9-10) ποιεῖ καὶ ... ἐπιτιθεμένη (sc. ἔμπλαστρος). With the neuter, sc. φάρμακον or ἄκοπον (cf. Paulus, in note 2-4, above).

6-8. The uses which are described in these lines, i.e. for fistulous ulcers resulting from a lithotomy or those from the lengthy, multiple incisions necessary in fracture-operations, are not specifically mentioned by either Galen or Aëtius in connection with the plaster of Azanites. (Cf. note to lines 3ff., above.) Oribasius, however, especially recommends the applications called "the tetrapharmacon, that of Azanites, and the Macedonicon," for treating the wounds left after the excision of corruption, and for inflamations complicated by spreading ulcers (III 561, 563).[47]

6. [κόλπ]ους: for κόλπος as a fistulous ulcer which spreads under the skin, see LSJ, s.v. III 6. The ailment is found many times in Galen and an agglutinant plaster is the treatment prescribed. Cf. e.g. that called ἡ Ἶσις of Epigones (XIII 774), another πολύχρηστον φάρμακον, which cites many of the same uses as those listed in the note to lines 3ff., above. Cf. also Orib. III 591; Aët. XV, p.113, 13-17; Paul. VII 17.44. κόλπους is found again in our codex in A verso, 12 and B verso, 4.

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45) Ἀζανίτου, two MSS; Ἀζανίου, two other MSS.

46) In view of the context, πληγή must here indicate a "wound", as in modern Greek, rather than a "blow or "strike", although the wound may well have been caused by a blow or strike. See also LSJ, s.v. οὐλή, for "scars" from πληγῶν as well as τραυμάτων.

47) The three recipes referred to are found in Orib. Frag.No.90 (IV 608).

λιθοτομίας: the surgical operation for removing stones, either from the bladder (κύστις) or the kidneys (νεφροῖ). Cf. Paul. VI 60.

7-8. ἐπὶ μεγ[άλων ἐ]πιδιερέσεων (-διαι-): "long multiple incisions." Also possible is μει[ζόνων ἐ., "multiple incisions of very great length." Cf. Orib. III 575,3 with respect to ἀποστήματα, "abscesses," which are frequently linked with κόλποι:[48] πάλιν ἐπὶ μὲν τῶν μικρῶν ἀποστημάτων μιᾷ διαιρέσει χρησόμεθα, ... ἐπὶ δὲ τῶν μειζόνων πλείοσι διαιρέσεσι χρώμεθα. "When the abscesses are small we use only one incision, ... but for those of greater size we use multiple incisions." Cf. also III 570,9: τὰς δὲ περιαιρέσεις τὸν αὐτὸν τρόπον θεραπεύσομεν καὶ τὰς μεγάλας διαιρέσεις, "we treat in the same way wounds resulting from surgical excisions and those resulting from incisions of great length."

8. ῥω[γμῶν]: "fractures." The possible alternative, ῥωχμῶν, "fissures", is exceedingly rare (cf. Stephanus, TGL, s.v. ῥωχμή) and is not likely to have occurred in the present text. For ῥωγμή see Gal. XIX 431-2 where, in sections 316-324, the several different kinds of bone fractures in the head are defined. Definition 317 has ῥωγμή ἐστιν ὀστοῦ διακοπὴ ἐπιπόλαιος εὐθεῖα καὶ ἤτοι στένη ἢ πλατεῖα, "a rhogme is a cleft of the bone, superficial and straight and either narrow or wide." Paul. VI 90.1 has ῥωγμὴ μὲν οὖν ἐστι διαίρεσις τοῦ κρανίου ἐπιπόλαιος ἢ βαθεῖα μηδαμῶς ἕως ἔξω μετακινηθέντος τοῦ πεπονθότος ὀστοῦ, "a rhogme is a division of the cranium-bone, superficial or deep, when the affected bone has in no wise been shifted outward." Soranus, CMG IV 155,2 has ῥωγμὴ μὲν οὖν ἐστιν ἁπλῆ ῥῆξις ὀστέου παραπλησία ταῖς ὁρωμέναις ἐπὶ τῶν ὑελῶν σκευαρίων ..., "a rhogme is a simple break of the bone resembling those seen in small, stone vessels ..." Cf. Hipp. περὶ ἑλκῶν 1 (VI 400) where he warns that there is risk of ulcers and inflammation in any part of the body in which a fracture has occurred.

9-12. See the Table of Ingredients and Amounts at the end of the commentary.

9. πίσσα, pitch, was a common ingredient in many preparations described by the ancient medical writers. For its occurrence in recipes on papyrus see Marganne, p. 367-8. In the Azanites recipe, Galen and Oribasius specify πίσσα ξηρά, "dried pitch," as does also one of the MSS of Aëtius, whereas Paulus substitutes χαλβάνη, the resinous juice of all-heal.

κηρός, bees-wax, was a prime ingredient of many plasters, particularly those prescribed for wounds, ulcers, abscesses, etc. For its occurrence in other papyri, see Marganne, p. 362.

ὀ[σύπου] = οἰσύπου. The word is restored from the parallel texts of Galen, Oribasius, and Paulus. See Dsc. II 74 for the definition of οἴσυπος as τὸ ἐκ τῶν οἰσυπηρῶν ἐρίων λίπος, "the fat from grease-containing wool," and the several methods for extracting it. See also Paul. VII 17.88 ὑγροῦ οἰσύπου τοῦ φαρμάκου σκευή, "the preparation of the medicament, moist wool-grease."

48) E.g. Aët. XV. p.90, 5-7; 91, 12-13; 93, 16-17; 113, 16-17.

The new Oxford Latin Dictionary (ed. P.G.W.Glare, 1982) has "oesypum, sometimes written oesopum (fr. Gr. οἴσυπος). The grease obtained from unwashed wool (used in medicine, as a cosmetic, etc.)."[49]

The Azanites text of Paulus (VII 19.6) has οἰσύπου φαρμάκου, "the medicament, oesypum"; but four of the MSS of Paulus have the spelling οἰσώπου, while four other MSS have ὑσσόπου = hyssop.[50] Hyssop, an herbal plant, is of course out of the question in this recipe and the word should have been punctuated ὑσσώπου = οἰσύπου. The interchange of οι and υ is extremely common. Cf. Gignac, Grammar, I 197, "This is the most frequent interchange in the papyri next to the interchanges of ει with ι and αι with ε." For the interchange of υ and ω, see Gignac, Grammar, I 293-4, and note that the Latin word is found with the same interchange. A double consonant, in place of a single consonant, and vice versa, is common enough to need no remark, although in the present instance it was undoubtedly caused by the similarity of sounds between οἴσυπος and ὕσσωπος.[51]

The Azanites text of Aëtius has ὑσσώπου, with no recorded variants in the MSS, but the presence of the short direction at the end of the recipe, τήξας χρῶ, "melt the ingredients together and use," shows that the ingredients must all be τηκτά, i.e. soluble ingredients. Hyssop is a plant or small shrub, and would be among the dried ingredients in the familiar brief direction, τὰ τηκτὰ κατὰ τῶν ξηρῶν, "add the melted ingredients to the dried ingredients."[52] We must therefore read in the Aëtius text ὑσσώπου = οἰσύπου.

10-11. στέατος ὑ̣[ίου καὶ ταυ]ρίου: Cf. D, 6 for the spelling ὑ̣ίου, and A, 8-9 for ὑ̣[ε]ίου. The Galen text of the recipe has the same two fats, that of swine and of bulls, but only half the amount of each, i.e. 3 oz. instead of 6 oz. The Aëtius recipe has the same two again, but specifies that the pig fat should be old and pure (παλαιοῦ καθαροῦ) and there should be 6 oz. of it to 3 oz. of bull fat. The recipe of Paulus calls for the same ratio of pig fat to bull fat (24 oz. to 12 oz.), but χοιρείου is substituted for ὑείου, i.e. fat of young pig rather than full-grown pig. Oribasius calls for an amount of pig fat four times that of bull fat, i.e. 12 oz. to 3 oz. and requires the pig fat to be melted separately (στέατος ὑείου τετηκότος).

11-12. πε[υκίνης (οὐγ.) ε: ε is restored from Galen and Aëtius, whose amounts in general are comparable to those in 21 B. But Galen has ῥητίνης πευκίνης; Oribasius has πευκίνης ῥητίνης ἢ πιτυίνης; and Aëtius, πιτυΐνης ἢ πευκίνης; while Paulus has ῥητίνης κολοφωνίας.

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49) Cf. Webster's Third New International Dictionary, 1971, s.v. lanolin: "wool grease refined for use chiefly in ointments and cosmetics; ... it is much used as a basis for ointments."

50) For the confusion of οἴσυπος with ὕσσωπος among the ancient writers, see Stephanus, TGL, s.v. ὕσσωπος.

51) Cf. LSJ, s.v. ὕσσωπος, for the spelling with one sigma, and likewise Latin hys(s)opum.

52) Cf. A, 11; B verso, 12.

12-14. These lines could not have been read without the parallel in the recipe of Galen (XIII 785, 6f.): ὅταν κοῖλα ᾖ τὰ ἕλκη, πλείονι χρῶ τῷ φαρμάκῳ, ὅταν δὲ πρὸς ἐπούλωσιν, ἔλαττον, "when the ulcers are in a cleft, use more of the medication; for cicatrization, use less." Cf. Aëtius XV, p. 123, 11f.

12. ⟨ᾖ⟩: the verb is often omitted and may not have been present in the exemplar from which our text was copied.

[πλίονι (= πλείονι) χρῶ]: the first spelling is preferred as the two words require a space equal to that occupied by πε[υκίνης] in the line above.

Table of Ingredients and Amounts

	21 B	Gal.XIII 784-5	Aët.XV p.123	Orib. Fr.90	Paul.VII 19.6
pitch	1	1	1	3	[ ][53]
wax	3	3	3	3	12
wool grease	3	3	3	3	12
pig fat	6	3	6	12	24
bull fat	6	3	3	3	12
pine resin	[5]	5	5	10	12

The amounts in the Table are in ounces. In Paulus the amounts are given in pounds (e.g. pig fat, 2 lbs., bull fat, 1 lb.) and have been converted to ounces.[54]

Inv. 21 B verso 7 x 8.7 cm.

- - - - - - - - - - - - - - - - -

θε]ρ[απ]εύει [τὰ ἕλκη] Plate 2b

(Hd.2,interl.) [καὶ τὰς] οὐλὰς

(Hd.1) [καὶ τὰ δ]υσεπούλ[ωτα καὶ]

[τὰ παλ]αιὰ καὶ τὰ ῥ[ευμα-]

4 [τικὰ] κ[α]ὶ κόλπους ἰᾶται

——— ——— ———

[πρὸ]ς λυπαρά τε ταῦτα τ[ὰ]

(Hd.2,interl.) πρεσ(βυτικὰ)

(Hd.1) [ῥεύμ]ατα πυοῦσα πρὸς π

ού-

(Hd.2,interl.) ερο

(Hd.1) [λὰς] ᾖ [[αφο]]υλωτικὴ ·

8 [καθμ]είας (δρ.) ιβ καρ⟨κί⟩νοι κε-

[καυμ]ένοι ποταμίου (δρ.) η

[ψιμιθί]ου (δρ.) ε κηροῦ (δρ.) ις

53) In place of πίσσα, Paulus substituted 3 oz. of χαλβάνη, the resinous juice of all-heal.

54) 1 lb. = 12 oz. For convenient tables of weights cf. Gal. XIX 752; Celsus, Loeb ed., vol. II, p. lxv.

[μυρσί]νου ἐλαίου κοτ(ύλας) ϛ̄
12 [τὰ τηκ]τὰ κατὰ τῶν ξηρῶ(ν)
(Hd.2,interl.) πρὸς υ ι
(Hd.1) [ποιῖ καὶ ἕλκη] π[ ]ρυκ[αυ-
[τα
- - - - - - - - - - - - - - - -

5. ὑπαρά 6. ποιοῦσα, c corr. fr. ο 8-9. καρκίνων κεκαυμένων ποταμίων 12. pap. ξηρῶ 13 ποιεῖ

Translation

It is a treatment for wounds, wounds that are scarred over, ulcers which are hard to cicatrize, long-standing ulcers, and discharging ulcers; it also heals fistulous ulcers.

A plaster which promotes cicatrization. It is effective against foul ulcers, discharging and chronic ulcers and wounds that are scarred over. 12 drachms of calamine, 8 drachms of burnt river crabs, 5 drachms of white lead, 16 drachms of wax, 6 kotylai of myrtle oil. Add the melted ingredients to the powdered ingredients. It is also good for ulcers caused by burns.

1-4. For these affections, which conclude a preceding recipe, cf. Gal. XIII 527 ἄλλη Παμφίλειος λεγομένη πρὸς τὰς προειρημένας διαθέσεις καὶ κόλπους παρακολλᾷ καὶ σύριγγας ἑκτυλοῖ. ποιεῖ πρὸς τὰ ῥευματικὰ τῶν ἑλκῶν καὶ πρὸς τὰ χρόνια καὶ δυσεπούλωτα. "Another cicatrizing plaster, that called the Pamphilion, for the afore-mentioned conditions, and it unites the edges of fistulous ulcers and removes calloused abscesses. It is effective also against the discharges of ulcers, against old ulcers, and against those that are hard to cicatrize." Cf. also XIII 645, 735ff., 778; Aët. XV, p.48,20ff. For a plaster on papyrus [πρὸς τὰ π]αλαιὰ καὶ δυσκα[τούλωτα] see P.Aberd. 10,9.[55)]

2, interl. The second hand added [καὶ τὰς] οὐλάς above the line, which indicates that the physician-owner collated his codex against an exemplar and repaired omissions. See Introduction, ad fin. For other omissions in the text see lines 6 and 12. οὐλαί are cicatrices of wounds which have become scarred over and which are sometimes painful. Cf. Gal. XIII 346,9 ποιεῖ καὶ πρὸς τὰς ἄλλας φλεγμονάς, καθαίρει καὶ τὰς οὐλὰς πονηράς, "it is effective against other inflammations, and it cleanses cicatrices which are painful." Dsc. Eupor, I 108 οὐλὰς δὲ μελαίνας αἴρει ἐπιχριόμενα, "ointments which raise (remove) black cicatrices;" I 109 τὰς δὲ ἐκ λειχήνων οὐλὰς καὶ τὰς ἄλλας δὲ ὁμοχρόους ποιῆσαι ‹δύναται› ὄνειον στέαρ καταχριόμενον, "an ointment containing donkey fat is able to make scars from lichen-like skin eruptions of a uniform color."

4. Beneath this line are remnants of a broken line followed by a blank space of one line to mark the end of the recipe.

55)]..αια και δυσκα[ed.pr. See plate I in the edition, and cf. Marganne, p.33.

5-7. These lines have the title of a new recipe, an ἐπουλωτική, a plaster which promotes cicatrization. Cf. Gal. XIII 522ff., περὶ τῶν ἐπουλωτικῶν, for many similar recipes.

5. λυπαρά = ῥυπαρά, sc. ἔλκη. For the common interchange of ρ and λ, cf. Mayser-Schmoll, I i, 161-2; Gignac, Grammar, I, 102-3. Less likely is λυπαρά = λυπηρά (painful ulcers). For the comparatively rare interchange of α and η (except for the well-known ἀνάλωμα/ἀνήλωμα) cf. Mayser-Schmoll, I i, 38, 54; Gignac, I 286. An instance of the word λυπηρός is found in Gal. XIII 1005 λυπηραὶ διαθέσεις, "painful conditions." The phrase τὰ ῥυπαρὰ ἕλκη is extremely frequent. Cf., e.g., Gal. XII 683,1; Orib. Syn. VII 2,1; Aët. XV, p. 39,9; p. 48,6; Paul. III 79,6; IV 41; VII 17,40; and A verso, 10-11 in our codex.

6. πυοῦσα = ποιοῦσα. For the interchange of οι and υ, see Mayser-Schmoll, I i, 89f.; Gignac, I 197f. Cf. B, 9 ὑ[σύπου] = οἰσύπου and note ad loc.

Pap. προσπ$^{\text{πρεσ}}_{\text{ου}}$ The second hand is responsible for πρεσ written above the line. The scribe who wrote the codex must have intended originally to include the omitted word since he has πρὸς π on the line, but he abandoned the π without cancelling it and wrote ου beneath it, the start on οὐλάς. For πρεσβυτικά (sc. ἕλκη) cf. Gal. XIII 731,8 ἐπουλωτικὴ πρεσβυτικῶν· πρὸς δὲ τὰ πρεσβυτικὰ σκωρίᾳ μολύβδου μετὰ μυρσίνης κηρωτῆς χρῶ. "A plaster for promoting cicatrization of old ulcers. For ulcers of long standing, use slag (dross) of lead with a myrtle oil-cerate." Dsc. Eupor. I 172 πρεσβυτικὰ δὲ ἀπουλοῖ ἕλκη ἀναγαλλὶς μετὰ κηρωτῆς, "pimpernel, added to a cerate, cicatrizes ulcers of long standing."

7. [[ἀφο]]υλωτική: the second hand drew a very black horizontal line through the letters αφο and wrote ε̣πο above them. ἐπουλωτικός and ἀπουλωτικός, as well as ἐπουλόω and ἀπουλόω, were used interchangeably by the medical writers (cf. LSJ, s.vv.). ἀφουλωτικός, on the other hand, is found only in Paulus, e.g. VI 5,26; VII 17,28 and 63, but in each case one or two MSS (D and/or F) have ἀπουλ- instead of ἀφουλ-. Since ἀπουλωτικός is also found in Paulus with no diverging MSS, e.g. IV 45, 2 and 4, it is probable that the forms with φ are the work of one or two scribes only and should be regarded as orthographic variants and not true forms. For the interchange of π and φ, cf. Mayser-Schmoll, I i, 145-6; Gignac, I 87-8. For an ἐπουλωτική on papyrus see P.Aberd. 10, Introduction and line 13 [ἡ ἐπουλω]τικὴ διὰ καδμεία[ς;[56] cf. Gal. XIII 524,4.

The large black dot at the end of the line was added by the second hand to set off the title.

8-11. The ingredients of the ἐπουλωτική are found in these lines but unfortunately two of the five are lost except for the final letters, -...ς in 8 and -ο̣υ in 10, and the name of the oil in 11 is also missing.

56)]γικη δια καδμεια[ed.pr. Cf. Marganne, p.33.

In Gal. XIII, 524-534 are thirty consecutive recipes, all ἐπουλωτικαί. In all except one, at least two or three metals are among the ingredients,[57] and in five of the recipes there are five metals.[58] It would seem therefore that our two lacunae in lines 8 and 10 ought to have held the names of metals. In the thirty recipes λιθαργύρου is found most often (25 times); ψιμυθίου is next with 18 occurrences; καδμείας is found in 7 recipes, as also χαλκίτεως; while στυπτηρίας occurs in 6, χαλκοῦ in 5, and διφρυγοῦς in 4.[59]

8. [καδμ]εί̣ας: also possible is [διφρυ]γο̣ῦς and perhaps χαλκί̣]τε̣ως. στυπτηρίας is too long. For καδμεία cf. Dsc. V 74; Gal. XII 219; and for its occurrence in papyri, Marganne, p. 361. In the introduction to his ἐπουλωτικαί, Galen has the following (XIII 523,10): εἰδέναι δὲ χρὴ τῶν ἐνδόξων φαρμάκων ἃ παρὰ πᾶσιν ἐπῄνηται, τό τε διὰ καδμείας καὶ τὸ διὰ τοῦ λαδάνου φάρμακον ἄριστον εἰς ἐπούλωσιν. οὐ παρὰ πᾶσι δὲ τοῖς ἰατροῖς ἡ τῶν μιγνυμένων ἁπλῶν φαρμάκων ὡμολόγηται συμμετρία. "It is necessary to know that of the highly esteemed medications which are approved by all physicians, that with calamine and that with ladanum are the best applications for promoting cicatrization. Not agreed upon by all physicians are the proportions of the individual ingredients to be mixed in."

8-9. καρ(κί)νοι κε[καυμ]ένοι ποταμίου (-άμιοι), nom. for gen.: cf. Dsc. II 10; Gal. XII 356. River crabs are not found in any of the thirty ἐπουλωτικαί of Galen mentioned above.[60] The closest parallel to our text which I have been able to locate is that of Archigenes in Paul. IV 26, 4 (= Gal. XIII 733,9ff.):[61] Ἀρχιγένους πρὸς καρκινώδη καὶ κακοήθη ἕλκη. καρκίνων ποταμίων κεκαυμένων καὶ καδμίας ἴσα λεῖα ἐπίπασσε, ἢ τὴν σποδὸν τῶν καρκίνων μετὰ κηρωτῆς ἐπιτίθει. "The recipes of Archigenes for cancerous and malignant ulcers. Rub to a powder equal parts of burnt river crabs and calamine and sprinkle on. Or, apply (as a plaster) the ashes of the crabs mixed with a cerate." A cerate was essentially a combination of wax and oil, with the addition of resin, fat, or other medicinal ingredients.

Other recipes of the medical writers which contain river crabs are, e.g., Dsc. Eupor. I 145,4, which has καρκίνοι ποτάμιοι κεκαυμένοι σὺν μέλιτι, a remedy for χοιράδες (scrofulous swellings on the glands of the neck); 193,1, which has the same ingredients and is a remedy for πονηρευόμενα ἕλκη καὶ σκληρίας κακοήθεις (malignant ulcers and malignant indurations). Cf. also

57) In the recipe on p.531,9, only one metal, litharge, is called for.

58) 2 metals, 11 times; 3, 11 times; 4, 3 times; 5, 5 times.

59) Several other metals are found fewer times.

60) There is, however, one instance of κηρύκων κεκαυμένων (trumpet shells), which are combined with λιθαργύρου, ψιμυθίου, κηροῦ, ἐλαίου, τερμινθίνης, λιβάνου, and ὕδατος (532, 14ff.).

61) I owe this reference to Prof. Ann Ellis Hanson, who scoured the computerized Galen at Princeton for instances of καρκίνος, crab, weeding out the references for καρκίνος, cancer. She discovered that crabs seem to have been much used only in antidotes, especially for poisonous bites and stings. Cf., e.g. Gal. XIII 436,4; XIV 169,2; 170,7; 172,7; 195,16.

Dsc. Eupor. I 171,3; 196; 212; II 122,5; Gal. XIII 436,4; Orib. Syn. VII 46; Paul. III 79,3.

10. [ψιμιθί]ου = ψιμυθίου: Also possible is [λαδάν]ου (cf. note to line 8, above) or [λιβάν]ου (cf. footnote 60); λιθαργύρου is too long and χαλκοῦ is too short. The spelling ψιμιθίου is found in A, 10 and is the normal papyrus spelling (cf. note ad loc.). For this metal see Dsc. V 88; Gal. XII 243. As mentioned above, it is found as an ingredient in 18 of the 30 ἐπουλωτικαί of Galen.

11. [μυρσί]νου: also possible is [ῥοδί]νου, if spelled [ῥοδεί]νου. For μυρσίνου ἐλαίου, cf. Dsc. I 39; for papyri, Marganne, p. 365. In his introduction to the ἐπουλωτικαί Galen (522,14) has the following: καὶ γὰρ τὰ διὰ τῶν μοτῶν ἐπιτιθέμενα φάρμακα τούτων τηκομένων ἐν ῥοδίνῳ ἢ μυρσίνῳ γίγνεται. καὶ μᾶλλόν γε τὸ μύρσινον τοῦ ῥοδίνου χρησιμώτερον, ὅσῳ καὶ στυπτικώτερόν ἐστιν. "Applications on pledgets become remedies when the ingredients are melted in rose oil or myrtle oil. Myrtle oil is more useful than rose oil, because it is more astringent." Among Galen's thirty ἐπουλωτικαί, where the oil is named, ἐλαίου μυρσίνου occurs 11 times, ἐλαίου ῥοδίνου ἢ μυρσίνου, twice, and ἐλαίου ῥοδίνου, once.

12. τὰ τηκτὰ κατὰ τῶν ξηρῶν is a frequent brief direction for the plasters of Galen. Cf., e.g., XIII 338,16; 339,8; 349,11; 675,13; 734,2. See also A, 11ff. and note. For a description of the melting process and the various ingredients that are melted or dissolved, see Gal. XIII 628ff.

13. [ποιῖ: for the spelling cf. A, 4; A verso, 6; B, 5; F, 6.

πρὸς, υ, and ι were added above the line by the second hand. The position of πρός indicates that it was meant to precede a four-letter word, and π`υ´ρ`ι´κ- was probably corrected from π[οι]ρυκ-.[62] For the interchange of υ and οι, see note to line 6, above; and for the interchange of ι and υ, Mayser-Schmoll, I i, 80; Gignac, I 267ff. One of Galen's thirty ἐπουλωτικαί (525,16) has the following title: ἄλλη ἡ πυρίκαυτος λεγομένη, ἐκ τῶν Ἀτταλικῶν δυνάμεων φάρμακον ἐπιτετευγμένον. "Another, called 'a plaster for burns' (i.e. for ulcers caused by burns), a proved remedy from the Attalian collections of prescriptions."[63] Cf. Aët. XV, p. 136,14. For a discussion of ἕλκη πυρίκαυτα cf. Hipp. περὶ ἑλκῶν 22 (Littré, VI 426); Orib. Syn. VII 6. For emollient plasters with no metals see Paul. VII 17,30 δι' ἀγχούσης πρὸς τὰ πυρίκαυτα, "the plasters with alkanet for ulcers caused by burns." Cf. also the uses of the Azanites recipe in note to lines 3ff. of B in our codex.

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62) Or from πιρυκ = πυρικ, a simple transposition of letters.

63) For "collections of prescriptions" see LSJ, s.v. δύναμις II 4. For another Attalian recipe for an ἐπουλωτική, cf. Orib. Syn. III 4. Cf. also Celsus 5.19.11.A, "the plaster of Attalus for wounds"; 6.6.5.B, "the salve of Attalus" for checking rheum.

P.Mich. Inv. 21 C 7.5 x 8.5 cm.

Plate 3a

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].[
]cτ..[
[...].τον ἀθ̣ε̣λδόμ[ενον ± 4]
4 [κ]α̣[ὶ] ὅ̣ταν ἐ̣νωθῇ ἐπ[ίβαλλε]
[τὸ]ν χυλὸν καὶ τὰ τηκ̣[τὰ συν-]
[εν]ώσας χρῶ ›———

ἡ πηγανηρὰ ἐ[κ τοῦ]
8 [Διο]νυσίου ̀β΄ τόμου πρ[ὸς νο-]
[μὰς πο]ιοῦσα καὶ ἕλκ[η καὶ]
[σύριγ]γ̣ας καὶ λειχ̣[ῆνας]
]...[

- - - - - - - - - - - - - - - - -

Translation

... and when it is mixed, add the juice and the melted ingredients; combine and use.

The rue plaster from the second book of Dionysius is effective for spreading ulcers, wounds, abscesses, and lichen-like skin eruptions ...

3. ἀθ̣ε̣λδόμ[ενον = διηθούμενος, "filtered". See Stephanus, TGL, s.v. ἀθέλδω, for references. διηθέω is the verb most commonly used by the medical writers for "filter, or strain." Cf. Aët. XV, p. 48,13 εἶτα ἐπίβαλλε τὰ τηκτὰ τακέντα καὶ διηθηθέντα, "then add the soluble ingredients which have been melted and strained." Cf. also pp. 44,3.16; 55,13; 61,12. The verb διηθέω is found in our codex in E verso, 13; H, 14; L verso, 7.

4-6. Cf. Gal. XIII 344,7 εἶθ' ὅταν καλῶς ἐνωθῇ ... λάμβανε ... μίξας χρῶ; 346,2 καὶ ὅταν ἐνωθῇ, ἐπίβαλλε κτλ.; 544,12 τελευταῖον τὰ τηκτὰ ἑψυσμένα καὶ ἐνώσας χρῶ.

4. ἐ̣νωθῇ: for this verb in our codex see E verso, 12; H, 2.

ἐπ[ίβαλλε]: the space would permit ἐπίβαλλαι (-βαλλε) as in D, 8-9.

5-6. συνεν]ώσας: for the compound verb in our codex see A verso, 3.

6. χρῶ: the scribe originally wrote χρωι, which he corrected to χρω by slightly enlarging the second loop of ω. In the vacant space after χρῶ is a long forked paragraphos, and between lines 6 and 7 is a blank space.

7. ἡ πηγανηρά: a rue-plaster. Sc. ἔμπλαστρος. For plasters with rue see Paul. VII 17.70 ἡ πηγανηρὰ πρὸς πλευριτικούς; Aët. XV, p.94 μάλαγμα πηγανηρόν; p. 131 τὸ πηγανηρόν. Alex.Trall. refers several times to the recipe, ἡ πηγανερά: II 185,24; 233,27; 241,4; but apparently does not anywhere list its ingredients. Among several recipes for plasters called ἑδρικαί, Galen has one entitled ἡ διὰ πηγάνου (XIII 311,5).

7-8. There is seemingly no "peganera" of Dionysius extant. For references to recipes of Dionysius in the works of Galen see XX 206; for those in Celsus, Loeb ed. III 629; and in Marcellus, CML V 285. None of the recipes calls for rue. In Orib. Fr. 102 (IV 615,7) there is the following: ἄλλο πρὸς σύριγγας καὶ μώλωπας ὃ ἔλαβον παρὰ Διονυσίου ἐν Ἱεραπόλει. "Another recipe for abscesses and skin eruptions which those in Hierapolis received from Dionysius," but it has no rue.[64)]

8. β was added above the line by the first hand. In Soranus, I 29.3 (CMG IV, p.19), the second book of Dionysius is referred to as entitled Περὶ κοινοτήτων, "Concerning 'The Common Features'," a term especially associated with the "Methodic" school in medicine (LSJ). For Dionysius called a μεθοδικός cf. Gal. X 53; XIV 684.

Among papyri there is at least one example of a recipe of Dionysius, SB VIII 9860 (e), 4-16, Διονυσίου ἡ ἀρετή (sc. σύνθεσις). There is also a good chance that a private letter, sent to a physician called Dionysius, which is dated to 58 A.D. and contains a request for information on specific medical recipes, may have been sent to the medical writer Dionysius (P.Mert. I 12).

8-10. πρ[ὸς νομὰς πο]ιοῦσα κτλ.: the restorations are illustrative. For νομάς with ἕλκη, cf. A verso, 6-8, and, e.g., Aët. XV, p.41,5-6; for νομάς with ἕλκη and σύριγγας, among other conditions, Aët. XV, pp. 43,1-2; 50,15-20; 57, 3-7. For ἕλκη with σύριγγας et al., cf. Gal. XIII 402,8; 527,5-6; 794, 14ff.;[65)] and with the addition of λειχῆνας, 787,13ff. See also Dsc. III 45.4, where πήγανον is described as ὠφελεῖ καὶ λειχῆνας σὺν μέλιτι καὶ στυπτηρίᾳ ἐπιτιθέμενον.

10. λειχ[ῆνας]: also possible is λέπ[ρας, especially since λειχῆνας is spelled λιχῆ[νας in L, 6 of our codex. For λέπρα with σύριγγες et al., cf. Gal. XIII 422. For λειχήν and λέπρα in papyri see Marganne, p. 364.

Inv. 21 C verso 7.5 x 8.5 cm.

- -

]..[Plate 3b

[ἡ] λ[ευκ]ὴ διὰ [δο]δίνου ἑ[μ-]
[πλα]στρ[ος σ]τέατος χοιρείου
4 [προ]σφά[τ]ου (δρ.) α λιθαργύρου (οὐγ.) (τέταρτον)
[ἀρ]ιστολοχίας μακρᾶς (οὐγ.) (τέταρτον)
[κη]ροῦ (οὐγ.) (τέταρτον) [ζ]μύ[ρ]νης (δρ.) (τέταρτον) ἐλαί-
[ου (οὐγ.)] ε ὠ[ῶ]ν ὀπτῶν λευ-

64) I owe to Prof. J.Arthur Hanson the reference to Gal. XIII 835,6, a λειχηνική of Διονύσιος συμμαθητής. The "fellow-disciple" is probably not our Dionysius, and, in any case, the recipe does not include rue.

65) Also Aët. XV, pp.39,18-20; 47,18; 78,23-4, et al.

8 [κὰ τρία c]κεύαζε κὲ χρ[ῶ]

]...[..]....[

4,5,6 Pap. ∂ 8. καὶ

Translation

The white plaster with rose oil: 1 drachm of fresh young pig fat, one-fourth ounce of litharge, one-fourth oz. of birthwort Longa, one-fourth oz. of wax, one-fourth dr. of myrrh, 5 oz. of oil, the whites of three cooked eggs. Prepare and use.

1. This line contained the end of the preceding recipe.

2. The title of this recipe, "the white plaster with rose oil," is not duplicated exactly in any of the seven parallel texts.[66] Galen's recipe, reported by Heras as taken from Asclepiades, is called ἡ Ῥοδιακή, "the Rhodian plaster." Aët. (1) has the title ἄλλη Ἀσκληπιάδου ῥοδίνη καλουμένη καλλίστη, with one MS calling it Ῥοδιακή. Orib. (1) and (2) are both called ἡ διὰ ὠῶν, "the plaster with eggs"; Aët.(3), "the plaster of Oribasius with eggs"; that of Paulus, "the plaster with white lead, or, with eggs"; while Aët. (2) has the strange name, Φυκοτύχη.[67] For white plasters in general, see Gal. XIII 409-457.

Our text does not give the purpose of the recipe, but it is found in three of the parallel texts. Galen and Aët. (1) and (2) describe it as a dispersing and healing remedy for hardened swellings of the breast, a good application for anal ulcerations, "and indeed all other ulcerations."[68]

3ff. It is seen from the Table of Ingredients and Amounts that our text is most similar to that of Orib. (2), including the omission of white lead. The amounts of pig fat and oil are the same, while litharge and wax have 2 dr. each in our text, but only 1 dr. each in Orib. (2).

3-4. [c]τέατος χοιρείου [προ]cφά[τ]ου: "fresh young pig fat." Aët. (1) has c. ὑείου π., "fresh pig fat." Gal. has c. ὑείου κατειργασμένου, "prepared pig fat." i.e., fat from which the fibres and sinews have been removed. Cf. A, 8-9, note. Orib. (2) has c. ὑείου, and Aët. (2), c. χηνείου, goose fat. Orib. (1), Aët. (3), and Paul. omit the fat altogether.

5. [ἀρ]ιcτολοχίας μακρᾶς: For the several different types of birthwort,

66) The seven parallel texts are: Gal. XIII 448,11; Orib. IV 608,31 = Orib. (1); 615,24 = Orib. (2); Aët. XV, p.128,1 = Aët. (1); p.128,9 = Aët. (2); p.127,7 = Aët. (3); Paul. VII 17.26. See the Table of Ingredients and Amounts at the end of the commentary.

67) Three of the six MSS of the text have Φικοτύχη. Cf. footnote 68.

68) The full title of Aët. (2) is ἡ Φυκοτύχη μάλιστα ποιοῦσα πρὸς τὰ ἐν δακτύλοις ἕλκη καί τἆλλα δὴ πάντα. The Φυκοτύχη of Paul. VII 17.32, although for the same purpose, is quite different from that of Aët. (2), with other metals and many more ingredients.

see Dsc. III 4; Gal. XI 835. ἁ, μακρά and ἁ. στρογγύλη (A.Longa and A.Rotunda, respectively) are the two types most commonly found in the works of the medical writers, although birthwort is most frequently found undifferentiated. It is particularly frequent in the χλωραί and μήλιναι, the yellow-green and yellow-orange plasters.[69] For its use as an ingredient to "fill ulcers," cf. Dsc. Eupor. I, 178. Our text seems to have a rare example of the ingredient in a λευκή plaster. For its occurrence in papyri, cf. Marganne, p. 356, and SB VIII 9860 (b) 8.

Among the parallels for this recipe, aristolochia is found only in our text, in the same way that saffron and deer marrow are found only in Aët. (2).

6. [κη]ροῦ: so also in Orib. (1), (2) and Aët. (2) and (3). It is omitted in Aët. (1),[70] while Gal. has κηροῦ Ποντικοῦ,[71] and Paul., κηροῦ τρακτοῦ, white or bleached wax.

[ζ]μύ[ρ]νης: σμύρνης is less likely, although it has occasionally been found in papyri. Cf. the relative number of references in Marganne, s.vv. ζμύρνη and σμύρνα.[72] Cf. also Mayser-Schmoll, I i, p.177; Gignac, I, p. 121.

6-7. ἐλαί[ου: the oil is rose oil according to the title in line 2. Orib. (1), Aët. (2) and (3) and Paul. all have ῥοδίνου. Orib. (2) has ῥοδίνου ἢ μυρσινίνου ἢ λελευκασμένου ἐλαίου, "rose or myrtle oil or oil that has been clarified." Aët. (1) has ἐλαίου λευκοτάτου, "the whitest oil," in the list of ingredients, but the brief introduction to the text has ἔστι δὲ καὶ ἑδρικὴ ἀγαθὴ τηκομένη ἐλαίῳ μυρσινίνῳ ἢ ῥοδίνῳ.[73] Gal.has only ἐλαίου in the list of ingredients but he adds, still quoting Heras (cf. note to line 2, above), "Asclepiades did not prescribe with which oil he wished the medicaments to be dissolved, but left it to us to experiment with the use of rose oil, myrtle oil, or some other oil."[74]

7-8. ὠ[ῶ]ν ὀπτῶν λευ[κά: "the whites of cooked eggs" appear only in our text. Aët. (2) and Paul. have "the whites of eggs," presumably uncooked.[75] Gal.,

69) Cf. Gal. XIII 466, 481, 492-507, 532-557.

70) The omission of wax in Aët. (1) was in all probability inadvertent, since the recipe was taken directly from Gal. XIII 448,11ff., as shown by its title, the amounts of the ingredients, and its stated purpose. Galen lumped together the first two ingredients, litharge and wax, ἀνὰ λίτραν α, and likewise the next two ingredients; ψιμυθίου δὲ καὶ στέατος ... τὸ τῆς λίτρας ἥμισυ τουτέστιν οὐγγίας ἓξ ἑκατέρου. The first ingredient of Aët. (1) is λιθαργύρου λίτραν μίαν, followed by ψιμμιθίου, στέατος ... ἀνὰ οὐγγίας ς.

71) For Pontic as the best wax, being naturally white, see Gal. XIII 411.

72) Of the four references given for σμύρνα, one has [σμ]ύρνης (p.130), and another has σβύρν[α]ν (p.248). Cf. Gazza, Aeg. 36, 1956, 97; Le Monde Grec, 560, note to line 5.

73) One MS omits μυρσινίνῳ and another omits ῥοδίνῳ. Cf. the title of Aët. (1) in the note to line 2, above. On the making of myrtle and rose oils, see Dsc. I 39 and 43.

74) Gal XIII 449, 1-4.

75) For such variation, cf. Gal. XII 531 ὠῶν ἑφθῶν λεκίθους δ, τινὲς ὠμῶν.

Orib. (2), and Aët. (1) have "the yolks of cooked eggs." Orib. (1) has ὠὰ ὠμά, uncooked eggs; while Aët. (3) has ὠά only, with the additional statement: τὰ ὠὰ τελευταῖα ἐν τῇ ἑνώσει συλλειοῦται, "the eggs, last of all, are triturated with the other ingredients in the mixing process."

λευ[κὰ τρία c]κεύαζε κὲ (= καὶ) χρῶ: If the numeral was not written out, the only alternative would seem to be κατασ]κεύαζε κτλ., but the compound verb is not often found in the recipes.[76] σκεύαζε καὶ χρῶ, on the other hand, is found frequently, sometimes with slight variations or additions.[77] If σκεύαζε is the correct reading, the numeral was written out and contained not more than 4 or 5 letters. τέσσαρα, a preferable restoration in view of the similarity of our text to that of Orib. (2), is too long for the lacuna, and πέντε would seem to be too large a number of eggs.

After the list of ingredients, one of the parallel texts, Aët. (1), has this direction on its preparation: ἕψε μέχρι καλῆς συστάσεως, καὶ ψύξας ἐπίχεε τοῖς ὠοῖς λειωθεῖσι μετ' οἴνου λευκοῦ, καὶ χρῶ ποτὲ μὲν ἀκράτῳ, ποτὲ δὲ ἀνιεμένῳ. "Boil until it is of a good consistency, and having cooled the mixture, pour it over the eggs which have been triturated with white wine. Use it either undiluted or diluted."

9. A new recipe was begun in this line, and the line was probably indented.

Table of Ingredients and Amounts

	21 C, verso	Gal.	Orib. (1)	Orib. (2)	Aët. (1)	Aët. (2)	Aët. (3)	Paul.
white lead		6	6		6	6	2	2
pig fat	1 dr.	6		1 dr.	6	6[82]		
litharge	2 dr.	12	6	1 dr.	12	6	2	2
birthwort	2 dr.							
wax	2 dr.	12	6	1 dr.	[ ][79]	6	1	6
myrrh	1/4 dr.	4			4 dr.[80]			
oil	5	18[78]	enough	5	18[81]	36	12	18
eggs	[3]	2	4	4	2	30	4	5
starch			6				2	3
saffron						1		
deer-marrow						6		

76) I noted only two examples: Aët. XV, pp. 121,8; 127,6.

77) E.g., Gal. XIII 359, 524, 525, 536, 556, 739, 744, 747.

78) The amount of oil in Galen's recipe is one and one-half κοτύλαι. Cf. Gal. XIII 893-4 for 1 kot. of oil = 12 oz.

79) See footnote 70.

80) 4 dr. = one-half oz. Two of the five MSS of Aët. (1) have 4 oz. in place of 4 dr., as in the parallel text of Galen (cf. footnote 70). The Kühn edition of Galen has no app.crit., but 4 oz. of myrrh seems a rather large amount to go with 18 oz. of metals (white lead and litharge), a ratio of

For the recipes in the Table see footnote 66. The amounts are in ounces unless otherwise stated. For easy comparison pounds have been converted to ounces at the ratio of 1 lb. = 12 oz., 1 oz. = 8 dr. (cf. Gal. XIX 752). For our text the amounts of litharge, birthwort, and wax (one-fourth ounce, each) are given as 2 dr. for easier comparison with Orib. (2). Convenient tables of weights are found in Gal. XIX 748ff.; Celsus (Loeb ed.) vol. II, pp. lxv-lxvii; Orib. Syn. II 58-59; Paul. VII 26.

1:4 1/2. Our own text has a ratio of 1:8, while 4 dr. of myrrh in Aët. (1) would yield a ratio of 1:36.

81) The oil in Aët. (1), (3), and in Paul. is given in λίτραι. For 1 lit. = 12 oz. see Gal. XIII 616, 11-12.

82) The fat in Aët. (2) is goose fat. Cf. note to lines 3-4, above.

P.Mich. Inv. 21 D 8.8 x 10.2 cm.

Plate 4a

- -

]...[

[ἐπιτι]θεῖτο τοῖς ἐπουλ[ωτι-]
[κοῖς] καὶ γὰρ πληροῖ ἕλκ[η κοῖ-]
4 [λα] ἰοῦ σκώληξ. ἢ το‹ῦ› Ὑγε[ιει-]
[νοῦ] μίσυος ὡμοῦ (δρ.) δ [ἰ]οῦ ξ[υστοῦ]
[(δρ. .] στέατος ὑίου (δρ.) δ κηροῦ (δρ.) δ
[τ]ήξας τὸ στέαρ καὶ τὸν κη-
8 ρὸν κατὰ τῶν ἄλλων ἐπί-
βαλλαι καὶ μίσγων χρῶ ›———

ἐφθὴ ἔμμοτος ᾗ χρώμεθα
ἰοῦ ξυστοῦ (δρ.) δ λε[π]ίδος χαλκ[οῦ]
12 [(δρ.) . σ]τυπτηρία‹ς› στρ[ογγύ]λης (δρ.) β
[ζμ]ύρνης (δρ.) ρ ἁλ[ός (δρ.) . ῥητί-]
[νης] (δρ.) σ οἰ δὲ τ [ἐλαίου κοτ(ύλην) α]
[δξους] τὸ ἁ[ρκοῦν
- -

4-5. Ὑγιεινοῦ 6. ὑείου 8-9. ἐπίβαλλε

Translation

... should be added to the medicaments which promote cicatrization, for iron rust (Aerugo vermicularis) fills hollow ulcers. The plaster of Hygienus: 4 drachms of crude misy (copper ore), ... drachms of scraped iron rust (verdigris), 4 drachms of pig fat, 4 drachms of wax. Melt the fat and the wax, and add to the other ingredients. Mix and use.

A refined tented plaster which we use: 4 drachms of scraped iron rust, ... drachms of copper flakes, 2 drachms of corn alum, 100 (?) drachms of myrrh, 100 drachms of wax (?), ... drachms of bitter aloes, 200 drachms of pine resin - other copies of the recipe have 300, 1 (?) kotyle of oil, a sufficient amount of vinegar, ...

2. [ἐπιτι]θεῖτο, "should be added" gives a suitable meaning; [προστι]θεῖτο is too long for the lacuna.

2-3. ἐπουλ[ωτικοῖς]: sc. φαρμάκοις, drugs which promote the scarring over of wounds. Cf. B verso, 7, with notes to lines 7 and 8-11.

3-4. πληροῖ ἕλκ[η κοῖλα]: On the filling of ulcers, cf. Paul. IV 40 τὸ κοῖλον ἕλκος τῆς ἐλλειπούσης σαρκὸς ἀπαιτεῖ τὴν ἀναπλήρωσιν, "the hollow ulcer requires the filling up of the deficient flesh." The medicaments used for this purpose are varied. Cf. Dsc. Eupor. I 178 πληροῖ δὲ τὰ ἕλκη βούτυρον, κηρός, ῥητίνη, ῥοδινον, κτλ. Orib. Syn. III 137 πάνυ γὰρ βαθύτατα ἕλκη πληροῖ τάχιστα. The ingredients of the recipe are the metals σπόδιον, μόλυβδος, θεῖον ἄπυρον, λεπὶς στομώματος, and gum. Aët. XV, p. 70,2 ἕλκη τε πληροῖ κοῖλα καὶ ἐπουλοῖ ταχύ, ῥοδίνῳ διηθὲν ἢ μυρσινίνῳ. The ingredients are the metal λιθάργυρος, oil, wax, et al. P. 103,22 τηκομένη δὲ σὺν ῥοδίνῳ ἐλαίῳ πολλῷ, τὰ κοῖλα τῶν κακοήθων ἑλκῶν μονογενῶς ἀναπληροῖ, "being melted with a great deal of rose oil, it fills the hollows of malignant ulcers in a unique way." The metals in the recipe are λεπὶς χαλκοῦ and ἰός.

4-5. ἰοῦ σκώληξ, μίσυος ὠμοῦ: iron rust in the form of worms, crude misy, copper.[83] For these metals as cleansing and less caustic than χαλκός, λεπὶς χαλκοῦ, and χαλκῖτις (other forms of copper), see Gal. XII 721,4 τούτου δὲ τοῦ γένους ἐστὶ καὶ τὸ μίσυ καὶ ὁ ἰός, ἰσχυρότατα φάρμακα τοῖς πρὸς συκώσεις καὶ τύλους ἁρμόττουσι μιγνύμενα. "Of this kind are copper and iron rust; they are the strongest medicinal ingredients suitable for ulcers which are of the type similar to ripe figs and for callouses." Cf. Paul. IV 43 and 44 on the powers of μίσυ and ἰός, together with other metals, in the treatment of fungous ulcers, spreading ulcers, abscesses, and putrid sores.

4. ἡ το⟨ῦ⟩ Ὑγε[ιεινοῦ] =Ὑγιεινοῦ: sc. ἔμπλαστρος.[84] Our recipe of Hygienus, a previously unknown recipe, contains four ingredients: crude copper, iron rust, pig fat, and wax. The known recipes of Hygienus include a collyrium for treatment of diseased eyelids and several plasters for various ailments.[85] One of the latter, that for hard-to-cicatrize ulcers, δυσεπούλωτα, (Gal. XIII 512), is similar to our recipe. It calls for ἰὸς ξυστός and κηρός, but substitutes χρυσοκόλλα (a copper carbonate) and λιθάργυρος for μίσυ, and adds two further ingredients.

5. [ἰ]οῦ ξ[υστοῦ]: σ[κώληκος] is too long for the lacuna. Cf. note to line 11, below.

6f. This recipe has only two soluble ingredients, pig fat and wax. Cf. A, 8-11, which has the same two solubles plus two metals, white lead and litharge, and is also a plaster for healing ulcers.

9. μίσγων: for the form see LSJ, s.v. μείγνυμι. The imperative μίσγε is

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83) For ἰοῦ σκῶληξ see Dsc. V 79.6; Aët. II 56. For misy as the top layer of three layers of copper ore (μίσυ, χαλκῖτις, σῶρι), especially found in Cyprus, see Dsc. V 100; Gal. XII 226; Aët. II 64.

84) For dropped letters in this codex see Introduction, ad fin.; line 12, below, and B, 2, 12-13. For the name Ὑγιεινός see Pape, Gr. Eigenn. It is a variant of the more common Ὑγῖνος, Ὑγεῖνος; cf. the fem. forms Ὑγίεια, Ὑγία, Ὑγεία.

85) Gal. XII 788; 488; XIII 353; 512 = 747.

frequently found in the medical writers, e.g. Gal. XIII 270,3; 551,11; 731, 11; 779,14; 864,5; Alex. Trall. II 575; Paul. VII 17.18; and in papyri, P. Aberd. 10,8. But cf. e.g. Gal. XIII 752,12 κηρῷ μίσγων ἴσον ἰῷ ἀπουλοῦν, "by joining together equal amounts of wax and iron it becomes a cicatrizing plaster."

10) This line, which introduces a new recipe, was not indented, but a blank space was left between it and the preceding line.

ἐφθὴ ἔμμοτος: sc. ἔμπλαστρος. For an ointment and a plaster described as ἐφθή, see Gal. XII 834, 835. On ἔμμοτος see notes to A verso, 5 ἔμμοτα φάρμακα and 7 ἔμμοτον ὑγρόν.

ἧ χρώμεθα: Galen usually employs the singular ἧ χρῶμαι, e.g. XIII 489, 490, 495; but occasionally he uses the plural, as in XIII 1027,1. Cf. also fo the plural Orib. III 569,14; Aët. VIII 16 (p. 427,16); XV, p.94,19.

11-15. The ingredients of this recipe are found, with slight variations and additions, among Galen's ἔμπλαστρα χλωρὰ λειχηνικά, "yellow-green plasters for leichen-like skin eruptions."[86] See especially XII 843,11 Τρύφωνος ἀρχαίου ἡ εὔχρους λεγομένη; and 843,15 Ἀντωνίνου, ταύτην Τιμοκράτης μετὰ τὴν ἐκδορὰν τῶν λειχήνων ἐπιτίθησιν, hereafter referred to as Gal. (1) and (2), respectively. And among the χλωρά taken from the works of Andromachus, XIII 493,7, that of Πασίων = Gal. (3); and 493,16, that of Ἀλκιμίων = Gal. (4); and from the works of Heras, XIII 775,6, that of Epigones, sometimes called "the Isis" = Gal. (5). Cf. the Table of Ingredients and Amounts at the end of the commentary.[87]

11. ἰοῦ ξυστοῦ: scraped iron rust (verdigris) was a granular form of rust as opposed to ἰοῦ σκώληκος, rust shaved off in the form of worms. ἰὸς ξυστός is more commonly found in the recipes for plasters. But see line 4, above, and note to lines 4-5.

13. [ζμ]ύρνης (δρ.) ρ: On the spelling see note to C verso, 6. The reading is not in doubt, and it is noteworthy that this ingredient immediately precedes ἁλ[ός, as in Gal. (5). In Gal. (4) the two ingredients are successive but in reverse order. However, the amount of myrrh, 100 drachms, is so enormously disproportionate to the amounts in Gal. (4) and (5) that we are forced to suspect that our rather careless scribe has conflated two ingredients, ζμύρνης and κηροῦ, giving myrrh the large amount which wax should have, and

86) XII 842.

87) Omitted from the Table are Gal. XIII 492,7 and Paul. VII 17.39, both duplicates of the Isis recipe of Epigones. They differ from Gal. (5) only in the amounts for resin (200 dr. in both), oil (one-third kot. in Gal. and one-half or one-fourth kot. in Paul.), and vinegar (both have "a sufficiency"), plus the addition of another ingredient. Omitted also is an ἔμπλαστρος λειχηνική of Aëtius (VIII 16, p. 425,24), which calls for large amounts of wax and resin (100 dr., and 200 dr., respectively), and many additional metals. In Gal. XIII 494 the Athena recipe calls for 250 dr. of wax and 300 dr. of resin, plus the ingredients of our text and several more in addition.

omitting wax altogether. All five of the Galen recipes have large amounts of wax; see the Table at the end of the commentary. In a rapid survey of many recipes in Galen which contain myrrh, I found no instance of an unusually high amount.

13-14. ἁλ[όης (δρ.) . ῥητίνης] (δρ.) σ οἰ δὲ τ: Among the parallel texts, ἁλόης is found in Gal. (4) and (5), while rock salt, ἁλὸς ἀμμωνιακοῦ, is found in Gal. (1), (3), (4), and (5). ἁλ[ός is possible in line 13 only if ἀμμωνιακοῦ were omitted. If included, ἁλ[ὸς ἀμμωνιακοῦ] would be the ingredient with the very large amount of 200 or 300 drachms. See preceding note. In four of the Galen recipes - (2), (3), (4) and (5), resin has the highest amount, while in (1) it shares the highest amount with wax.

ῥητίνης]: Gal. (1) has φουκτῆς, (2) κολοφωνίας, (3) ῥητίνης κολοφωνίας, (4) and (5) τερμινθίνης.

14. (δρ.) σ οἰ δὲ τ: The remnant of tau is a horizontal stroke which is too long to suit the top of rho. Cf. Gal. (5): (δρ.) σ οἰ δὲ ρ. On the use of οἰ δέ to indicate alternative amounts of an ingredient, cf. ZPE 23,1976, 124-5. Examples of expanded statements are the following: Gal. XIII 721,15 ἰοῦ ξυστοῦ (δρ.) β, ἐν ἐνίοις δὲ τῶν ἀντιγράφων γέγραπται (δρ.) α; Aët. VIII 16 (p.424,21) ἐν ἄλλαις γραφαῖς οὕτως κτλ.

14-15. ἔλαιον and ὄξος are the last ingredients in all of the parallel texts. In three of the five texts, the oil is given in κοτύλαι: 1 kotyle in (2) and (5) and one-half kotyle in (4). Gal. (1) has 10 ounces which is equivalent to five-sixths of a 12-ounce kotyle.[88] But see Gal. XIII 894 for the μικρὰ κοτύλη of 10 ounces, which was the probable intention in Gal. (1). Gal. (3) has one-half kyathos = one-twelfth kotyle.[89]

15. [ὄξους] τὸ ἁ[ρκοῦν: Gal. (1) and (2) have the same; (3) has τὸ ἱκανόν; (4) has κοτύλης ἥμισυ; and (5) κο(τύλας) β.

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88) For 12 ounces = 1 kotyle, see C verso, footnote 78.

89) For the equivalence of 1 κύαθος = one-twelfth of a ξέστης = one-sixth of a κοτύλη, see Gal. XIX 766. The text of Gal. (3) has ἐλαίου κυάθου τὸ ἥμισυ in the edition of Kühn which has no app.crit. But in view of the very small amount of oil denoted by a half kyathos, one wonders if κυάθου τὸ ἥμισυ were perhaps an error for κοτύλης ἥμισυ, as in Gal. (4). Or, if symbols were used, κυ(άθου) ϛ (= one-half kyathos) could easily be confused with κυ(άθους) ς (= 6 kyathoi = 1 kotyle), as in Gal. (1), (2), and (5).

Table of Ingredients and Amounts

	21 D 10-15	Gal. (1)	Gal. (2)	Gal. (3)	Gal. (4)	Gal. (5)
iron rust	4	16	12	8	16	8
copper flakes	[ ]		12	12	18	8
corn alum	2	16	12	8	16	6
myrrh	100[90]				16	12
aloes	[ ]				12	12
wax	100[90]	200[91]	100	150	150	100
resin	200/300	200[91]	200	300	200	200/100
oil	[1 kot.]	1 kot.[92]	1 kot.	1/12 kot.[93]	1/2 kot.	1 kot.
vinegar	enough	enough	enough	enough	1/2 kot.	2 kot.
rock salt		16		8	12	8
manna		16	12			
copper		32		8	16	8
all-heal			12		16/12/8	12
frankincense				16	10	8

The amounts in the Table are in drachms. The ounces and pounds of Gal. (1) have been converted to drachms for convenience of comparison at the ratio of 1 lb. = 12 oz. and 1 oz = 8 dr. Cf. Gal. XIII 492,13; 616; XIX 752. Gal. (4) and (5) have two additional ingredients, not given in the Table, birthwort (ἀριστολόχεια) and incense-gum (ἀμμωνιακὸν θυμίαμα).

Inv. 21 D verso 8.8 x 10.2 cm.

Plate 4b

- - - - - - - - - - - - - - - - - -
[...].[....].....[
[...]..... c πρὸc [τὰc]
ἄφθαc ἕλκη μετὰ cέρ[εωc]
4 [χ]υλ[οῦ πρὸc] νομὴν μετ[ὰ]
[.].[.]..[.].....[.].
[μ]ετὰ ἀκράτου [τ]οῦ ἐλαίου κ[αὶ]
ὀξοὺc πρὸc κὲ τὰc cηπεδώ-
8 νac μετὰ χοιρείου cτέατοc

90) Cf. note to line 13.

91) For wax and resin Gal. (1) has λίτραc β (= 24 oz. = 192 dr.). This approximates the round number 200; cf. the amount of resin in our text and in Gal. (2), (3), (4), and (5), where the quantities are given in units of 100 dr.

92) This is a "small" kotyle. Cf. note to lines 14-15, above.

93) See Footnote 89).

καὶ χυλοῦ εἰτέας πρόσθε-
τα ἐν τοῖ[c] πέλμηcιν ῥα-
γάδας κὲ δακτύλοις ἀκρά-
12 τῳ τῆς ξυ[λ]ίνης παραπλε-
[κ]ό̣μενα τ[ῶν] φαρμάκω̣[ν]
[...]..[.....] κράμβη̣[c]
]....[
].[
- - - - - - - - - - - - - - -

7. καί, cηπεδόνας 9. ἰτέας 10. πέλμαcι 11. καί

Translation

... for aphthae and ulcers, triturate with the juice of endive; for spreading ulcers, with ...; for ..., triturate with undiluted oil and vinegar; and for septic ulcers, with young pig fat and juice of willow. Applications for cracks of the skin on the palms of the feet and the toes are the mixtures of medicines with the undiluted juice of willow. ...

2-3. πρὸc [τὰc] ἄφθαc ἕλκη: On ἄφθαι, small ulcers of the mouth, see Gal. XII 988 περὶ τῶν πρὸc ἄφθαc φαρμάκων, 990,7 τὰ ὑπ' Ἀνδρομάχου γεγραμμένα πρὸc ἄφθαc. For ἄφθαι joined with ἕλκη cf. 990,12 πρὸc ἄφθαc καὶ ἕλκη. Cf. also XII 54, s.v. κύπροc: καὶ μὲν καὶ τοῖc ἐν τῷ cτόματι γιγνομένοις ἕλκεcιν αὐτομάτοις καὶ μάλιcτα τοῖc ἀφθώδεcιν αὐταῖc τε τῶν παίδων ταῖc ἄφθαιc ἁρμόττει διαμαcώμενα. "Cyprus (henna) is suitable for spontaneous ulcers present in the mouth, and especially for those suffering from aphthae; it also joins together chewed-up flesh in the same aphthae of children." Gal. XII 59, s.v. λευκόϊον: οὕτω δὲ καὶ μετὰ κηρωτῆς ἕλκη δυcεπούλωτα θεραπεύει· χρῶνται δ' αὐτῷ τινεc cὺν μέλιτι καὶ πρὸc ἄφθαc. "With a cerate, gilliflower heals hard-to-cicatrize ulcers; and some use it with honey for aphthae."

2-9. πρὸc ... μετὰ ... (quater): for the structure cf. PSI X 1180,56ff.: λεάναc χρ(ῶ). πρὸc ἐρυcίπελ(ατα)[94] μεθ' ὕδατοc, πρὸc ἑρπηcτικὰ μετ' οἴνου Αἰγυπτίου, τραυματικὴ ἀναπληροῖ μετὰ μέλιτοc, ὠταλγίαc μεθ' ὑδρομέλιτοc, πρὸc ῥαγάδ(αc) μετὰ βουτύρου ἢ καρίου χυλοῦ, κτλ. "Triturate (the ingredients) and use. For erysipelas, triturate with water; for spreading ulcers, with Egyptian wine. As a remedy for wounds, with honey, it fills in the hollows; for earache, triturate with hydromel; for cracks of the skin, with butter or juice of nut."

3. cέρ[εωc]: endive. Also possible is cέρ[ιδοc], but the medical writers seem generally to prefer cέρεωc. Cf. Gal. XII 119; Sor. I 51.2 (acc. cέριν); Alex.Trall. I 341,4; 439,17; II 271,23; 409,18; Aët. I 355; but Dsc. Eupor. I 212 cέριδοc. Also found is cέριοc (Gal. XI 54,15). The only reference in papyri to cέριc is found in P.Mich. II 123 Verso IX 23, a grapheion account

94) ἐρυcίπελαc is usually found in the plural. Cf. Gal. XIII 835-837; Dsc.Eup. I 160, 161; Orib. III 655; IV 616; Aët. XV, p.11; and in our codex, A verso, 9. and notes ad loc.

of the first cent. A.D., τιμῆ(c) κράμβης καὶ σέρεων.[95)]

On the two kinds of endive, ἄγρια, wild, and ἥμερος, domestic or cultivated, and their use, see Dsc. II 132; Gal. XII 119. In Dsc. Eupor. I 212, the juice of endive with manna heals cracks in the skin: τὰς δὲ ῥαγάδας θεραπεύει ... σέριδος χυλὸς σύν μάννῃ.[96)] Cf. note to lines 10-11, below.

4. νομήν: on this type of ulcer see A verso, 7, note.

5. A horizontal break through this line has carried away most of the writing, so that remnants of ink are too meager for satisfactory identification of letters. The line contained the ingredient used for spreading ulcers (line 4) and the name of another ailment (πρὸς ...) for which undiluted oil and vinegar were used (line 6).

7-8. σηπεδόνες, putrid, septic ulcers, are frequently found with νομαί, spreading ulcers, ῥυπαρὰ ἕλκη, foul ulcers, et al. Cf. Gal. XII 683; XIII 473, 731, 778, 909; Dsc.Eup. I 190, Orib. IV 515, 620,23; Aët. XV, pp.41, 110, 135.

9. εἰτέας = ἰτέας. The correct spelling is found in E verso, 7. On the willow tree and its uses see Dsc. I 104; Gal. XI 891. The fruit, leaves, bark, and juice are said to have an astringent quality. A yellow plaster of Galen (XIII 800), called ἡ διὰ ἰτεῶν is highly esteemed and has many applications, e.g. for bleeding ulcers, abscesses, and erysipelas. It calls for the leaves of willow. A variant recipe called μέλαινα ἡ διὰ ἰτεῶν (XIII 740-741) calls for tender leaves (ἁπαλῶν τῶν φύλλων) and is recommended for discharges, hard-to-cure ulcers, cancerous affections, and all indurations. A recipe of Aëtius (XV, p.61), entitled ἐκ τῶν Ὀρειβασίου ἡ διὰ τοῦ χυλοῦ τῆς ἰτέας, gives the method of extracting the juice from the leaves. A cosmetic recipe for darkening hair calls for the juice of the bark of willow (Gal. XII 444).[97)]

10-11. ἐν τοῖ[c] πέλμησιν ῥαγάδας κὲ (= καὶ) δακτύλοις: For a definition of ῥαγάς see Gal. XIX 446 ῥαγάς ἐστι διαίρεσις τετυλωμένα ἔχουσα τὰ χείλη, "a rhagas is a break of the skin which has calloused edges." Cf. Dsc. Eupor. I 196 ῥαγάδας δὲ τὰς ἐν ποσὶ θεραπεύει ἐντιθέμενα, "applications which heal cracks of the skin on the feet." Orib. Fr. 97 (IV 611,21) ἡ ἀνίκητος πάγχρηστος, "an unfailing all-purpose medication" ... πρὸς τὰς ἐν πέλμασι ῥαγάδας. Fr. 113 (IV 621) πρὸς ῥαγάδας πελμάτων καὶ πτερνῶν (heels). Syn. VII 46 (V 391) πρὸς τὰς τῶν δακτύλων ῥαγάδας καὶ τῶν ὅλων ποδῶν. Aët. XV, p.74,7 ἰᾶται τὰς ἐν πέλμασι ῥαγάδας ἀνεθὲν ῥοδίνῳ. Cf. Paul. III 79, and note to lines 2-9, above.

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95) P.Mich. II 128 (a) is a duplicate of 123 Verso IX 8-30.

96) For other examples of the use of endive-juice in various remedies, cf. Dsc. II 132, ad fin.; Alex.Trall. I 341, 439; II 409.

97) I owe many thanks to Prof. John Arthur Hanson who sent me all of the instances of ἰτέα in Galen from the computer, and many other words I requested while working on Mich. Inv. 21.

11-12. ἀκράτῳ: sc. χυλῷ.

12. τῆς ξυ[λ]ίνης = ἰτέας; cf. line 9.

14. κράμβη[c]: On the kinds and uses of cabbage see Dsc. II 120-122. Gal. XII 42-44. Together with meal of fenugreek and vinegar, it is good as a plaster for long-standing and foul ulcers; and the leaves of it, ground small and applied either alone or with barley-groats will help all inflammations, erysipelas, leprosy, and carbuncles.

P.Mich.Inv. 21 E 9.3 x 13.5 cm.

Plate 5a

- - - - - - - - - - - - - - - - - - - -

] ..[

τὰ τ̣η̣κτὰ καὶ [τὰ ξηρὰ λει-]

ὡcαc ἀνάλαβ[ε ποιῖ δὲ καὶ]

4 πρὸc πάντα θη[ριώδη ἕλκη]

Ἡρᾶ φ[α]ι̣ὰ ἡ ἔμπ[λαcτροc]

λιθαργύρ[ο]υ (λίτραc) β [δητίνηc (λίτ.) .]

λεπ[ί]δο̣c χ[α]λ̣κ̣ο̣[ῦ (λίτ.) . μάννηc (λίτ.) .]

8 κηροῦ (λίτ.) β ἐ̣λ̣α̣[ίου (λίτ.) .]

μηλίνη Τ[ελαμώνιοc]

καλουμένη λιθ[αργύρου ψιμι-]

θίου πιτυΐνηc ἀ[cβέcτου ἀνὰ]

12 (λίτ.) ξ ἐλαίου (λίτ.) ξ [κηροῦ (λίτ.) .]

[ί]οῦ ξυcτοῦ (οὐγ.) [. ποιῖ δὲ καὶ]

[π]ρὸc τὸ ἕνα[ιμον τραῦμα]

[καὶ πλ]ηγὰc [τῶν θηρίων]

- - - - - - - - - - - - - - - - - - - -

3. ποιεῖ 10-11. ψιμυθίου. Cf. A, 10.

Translation

Pound the dry ingredients and add the melted ingredients to make a medication. It is good for all malignant ulcers.

The grey plaster of Heras: 2 lbs. of litharge, ... lbs. of pine resin, ... lbs. of copper flakes, ... lbs. of frankincense, 2 lbs. of wax, ... lbs. of oil.

The yellow plaster called "Telamonios": 6 lbs. each of litharge, white lead, pine resin, and unslaked lime, 6 lbs. of oil, 6 (?) lbs. of wax, ... oz. of scraped iron rust. The plaster is effective for bloody wounds and for injuries caused by wild beasts.

Approximately 10 letters are lost from every line on the right side of the text, and the supplements are frequently illustrative.

1-4. These lines contain the end of a recipe for a plaster to be applied to malignant ulcers.

3. ποιῖ (= ποιεῖ) δὲ καὶ]: Cf. A, 4; B, 5; et al. Also possible is χρῶ δέ, καὶ χρῶ, aut sim. Cf. Aët. XV, p. 54,16 ... καὶ ἐπίχεε τοῖc λειωθεῖcι, καὶ

ἑνώcac ἀναλάμβανε καὶ χρῶ. αὕτη ποιεῖ πρὸc τὰc προcφάτουc διαιρέcειc, πρὸc νύγματα, κτλ. "Pour (the melted ingredients) over the pounded dry ingredients, unite, mix, and use. This is effective for recent breaks, lesions, etc." And cf. p.130,10 ἐν τῇ θυίᾳ ξηρὰ ἐπίβαλλε τούτοιc τὰ τηκτὰ καὶ ἑνώcac ἀναλάμβανε. χρῶ δὲ ἐπὶ μὲν τῶν ἀνθράκων ... "Cast the (pounded) dry ingredients into a vessel, unite the melted ingredients with them, mix, and use for carbuncles, etc." Cf. also Orib. Syn. VII 11 (V, 339), a section titled περὶ κακοήθων ἑλκῶν, "concerning malignant ulcers," which has the following (342,5): τὸν κηρὸν θερμάνας καὶ μαλάξας ἀνάλαβε τὰ ξηρὰ λεῖα, καὶ εἰc ὀθόνιον ἐμπλάcαc ἐπιτίθει. πρὸc δὲ τὰ θηριώδη (sc. ἕλκη) cίδιον λεῖον καύcαc ἐπιτίθει. "Heat and soften the wax and add the pounded dry ingredients; make it into a poultice on a piece of linen and apply. For malignant ulcers, burn pounded pomegranate-peel and apply."

4. πρὸc πάντα θη[ριώδη ἕλκη]: The dotted letter is represented by a vertical stroke on the edge of the papyrus. ἕλκη may have been omitted, leaving a short line as the final line of the recipe. For θηριώδη ἕλκη see LSJ, s.v. θηριώδηc, III, and Dsc. II 108.2, where bitter vetch (ὄροβοc) is said to cleanse ulcers and cause malignant ulcers ((θηριώδη), carbuncles (ἄνθρακεc), and a disease of the skin (κηρία) to be broken up. Cf. Aët. II 96 (p.186,33) where ὀρὸc γάλακτοc (whey, the watery part of milk) is good πρὸc τὰ παλαιὰ δὲ ἕλκη καὶ τὰ θηριώδη.[98)]

For πρὸc πάντα θη[ρίων δήγματα], "for all bites of wild beasts," as an alternative reconstruction of line 4, cf. Gal. XIII 906,3, where a plaster of Crito has εὔθετεῖ δὲ καὶ πρὸc πᾶν δῆγμα τῶν θηρίων.[99)]

4, marg. A curving line (⁀) before πρόc joins the paragraphos below πρόc to mark the end of one recipe and the beginning of another. No space was left by the scribe between lines 4 and 5, but line 5 was indented to further mark the beginning of a new recipe.

5. Ἡρᾶ: The name was added by the second hand in the space left by the indentation of the line, with initial eta extruded into the margin.[100)]

φ[α]ι̣ά: Also possible is ι̣[ε]ρ̣ά. Cf. below. The name of the plaster contained no more than four letters, the last of which is alpha. The small remnant of the first letter is the bottom of a descender, suitable for φ, ι, or ρ. Rather more of the third letter remains, but it also is a descender, suitable for the same three letters. Our recipe has six ingredients, of which four are preserved: litharge, copper flakes, wax and oil.

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98) I owe the references to Aëtius and Paulus to Ann Ellis Hanson of Princeton who sent me all the references to θηριώδηc in the works of the medical writers which have so far been put on computer.

99) Cf. also Gal. XIII 778,17 for θηρίων πληγάc and note to lines 14-15, below.

100) For other recipes of Heras in our codex see Introduction, with footnote 10; A, note to line 6; B, note to lines 2-4.

A φαιά was a grey-colored plaster.[101] Cf. Gal. XIII 886ff. for a discussion of the πολύχρηστοι φαιαί, the "many-purpose grey plasters," and 890-923 for eighteen successive phaiae of Andromachus.[102] Our text does not give the purpose of the recipe but four of those of Andromachus, all named Αἰγυπτία (Nos. 1, 2, 17, 18), and the Τυρία and "another" (15, 16) are said to be especially efficacious for bloody wounds and other ulcerations, for all abscesses, malignant ulcers and similar conditions, for ruptures of tendons and muscles, nerve lesions, sprains, etc.[103] Nos. 5-7 are described as useful for ulcers which are hard to cicatrize and for malignant wounds. No. 8 is suitable for septic and fistulous ulcers and abscesses. Nos. 13 and 14, the Ἑλλησποντία of Andromachus and of Heras, respectively, promote exhalation, freedom from inflammation, and reduce scrofulous swellings of the glands.[104]

In these phaiae the number of ingredients ranges from four to eighteen, with the majority having seven to ten. Only one of the eighteen φαιαί of Andromachus, No. 6, the ἀνώδυνος Ἰσιδώρου, has six ingredients, of which four are the same as those preserved in our text: litharge, copper flakes, wax, and oil. The remaining two ingredients in No. 6 are ῥητίνης Κολοφωνίας and μάννης. "Colophonian resin and frankincense." Cf. notes to lines 6 and 7, below.

For ἱ[ε]ρά as the alternative name of the plaster in our text, see Gal. XIII 778-9 (= 804-5), where a plaster of Heras, ἡ διὰ δικτάμνου (dittany), is called ἱερὰ ἡ ἐκ τοῦ ἐν Μέμφει Ἡφαιστείου, "the sacred plaster from the temple of Hephaestus in Memphis." It is referred to as a κιρρά (a bright yellow plaster) which, among the temple remedies, is held in the very highest esteem (518,7). It has the four ingredients preserved in our text, plus resin (κολοφωνίας ὑγρᾶς οἱ δὲ πευκίνης) and frankincense (μάννης) and ten additional ingredients. It is included among the πολύχρηστα φάρμακα of Galen (763ff.) and is recommended for all the uses mentioned above for the φαιαί plasters.[105]

101) Cf. references in LSJ and Stephanus, TGL, s.v. φαιός, for its composition of black and white. Cf. also the descriptive color-names of plasters of Andromachus in Gal. XIII 472,13: φαιά, πυρρά (yellow-red), μέλαινα (black, dark), and χλωρά (yellow-green, pale green); 496,14: χλωρά, μηλίνη (yellow), and λευκή. In our codex see C verso, 2 for a λευκὴ ἔμπλαστρος and line 9, below, for a μηλίνη.

102) They are found, in order, on pp. 890,16; 903,17; 906,16; 907,6; 908, 10; 13; 15; 909,16; 911,11; 912,5; 913,2; 6; 914,4; 14; 916,13; 918,14; 920, 3; 922,8.

103) Gal. XIII 899-901; 903; 906. Cf. Orib. XLIV 7.7 (III 569,11) where the φαιά is mentioned as an agglutinative plaster for abscesses.

104) No.14 is the only φαιά, among the eighteen φαιαί of Andromachus, which is attributed to Heras. But it is not our recipe; it has litharge, copper flakes, and oil, but no wax. The additional ingredients are pitch, ladanum-gum, iron rust and all-heal.

105) For ἱερά as the name of some antidotes see LSJ, s.v. ἱερά II; Orib. Eupor. IV 144.

6. λιθαργύρ[ο]υ: litharge, lead monoxide, is included in all eighteen phaiae, and is the first ingredient in fifteen instances. The amount of litharge, 2 dr., is the same as the amount of wax in line 8 - the only two amounts which are preserved in our text. In the fourteen phaiae which also have wax the amounts of litharge and wax are the same in six of the recipes (Nos. 1, 2, 6, 9, 10, 17). In No. 4 the amount of wax is double that of litharge, but in all other cases the amount of litharge is double, quadruple, or more, that of wax.

[ῥητίνης (λίτ.) .]: resin is present in 15 of the 18 phaiae: ῥητίνης 6 times, and τερμινθίνης 10 times.[106] The latter is too long for the lacuna in line 6, as also κολοφωνίας (sc. ῥητίνης).[107]

7. λεπ[ί]δος χ[α]λκο[ῦ: copper flakes are found in 12 of the 18 phaiae. In 5 of the remaining 6, χαλκοῦ κεκαυμένου, burnt copper, is used instead.

μάννης (λίτ.) .]: also possible is λιβάνου. μάννης, or λιβάνου, or μάννης λιβάνου, frankincense, is found in 12 of the 18 phaiae.[108]

8. κηροῦ is found in 14 of the phaiae. On the ratio of the amount of wax to that of litharge see note to line 6.

ἐλα[ίου (λίτ.) .]: oil is present in all of the 18 phaiae. There are 13 instances of ἐλαίου, olive-oil, and 7 instances of κίκεως,[109] κικίνου,[110] or ἐλαίου κικίνου [111] castor-oil. Nos. 12 and 18 call for both olive-oil and castor-oil.[112] It is possible that line 8 in our text had ἐλα[ίου κικίνου (λίτ.) .], since the lacuna at the end of line 7 accommodated 11 letters

106) No.6 has ῥητίνης Κολοφωνίας, and No.5 has ῥητίνης (δρ.) δ, κολοφωνίας (δρ.) η. [The 4 dr. after ῥητ. was surely inadvertently inserted between ῥητ. and κολοφ., when the scribal eye strayed to one of the instances of "4 dr." in the preceding line.] No.7 has ῥητ. ξηρᾶς, while No.9 has τερμινθίνης (δρ.) ιβ, ῥητ. ξηρ. (δρ.) ις, which may well be a copying error in the same way as No.5. No. 15 has πιτυΐνης (sc. ῥητ.).

107) Cf. P.Grenf. I 52, 7, for an instance in the papyri of κολοφωνίας standing alone.

108) μάννης, 3 times; λιβάνου, 7 times. The two instances of μάννης λιβάνου in No.12 (913,8) and No.18 (922,12) both have copying errors, as shown by the text in both cases. No.12 has λιθαργύρου (δρ.) ρμδ (= 144 δρ.) ... τερμινθίνης (δρ.) οβ (= 72 δρ.), ἀμμωνιακοῦ θυμιάματος (δρ.) οβ, μάννης, λιβάνου ἀνὰ (δρ.) ρβ (of each 102 dr.). After the ingredients Galen has the following: "It is evident that he (Andromachus) intended the amount of litharge ... to be double that of τῆς τερμινθίνης καὶ τοῦ θυμιάματος καὶ τοῦ λιβάνου." The text should therefore have been μάννης λιβάνου (δρ.) οβ. For μάννα λιβάνου cf. LSJ s.v. μάννα.

No.18 has, in the metre of the poet-medical writer Damocrates, Τερμινθίνης τε τῆς καλῆς τρὶς ιβ, Μάννης, λιβάνου τε ταὐτὸ τῇ τερμινθίνῃ. In the following directions for mixing, each ingredient is mentioned separately, but μάννης, λιβάνου τε is represented by τότε βαλεῖς τὴν μάνναν. The text needs only to have the comma removed after μάννης.

109) Nos. 1, 2, 5, 10, 12. Cf. Gal. XIII 893,3 τοῦ κίκεως, ὅπερ ἐστὶν ἐλαίου κικίνου.

110) No.18 (922,8).

111) No.17 (920,11).

112) Nos. 12 and 18 (913,11-12; 922,8).

with no iotas.

(λίτ.) .] has been restored in line 8 because of its use in line 12, where also the amounts of the other ingredients are given in λίτραι, but κοτ(ύλας), as in B verso, 11, is of course possible. Among the 18 phaiae the amount of oil is given in κοτύλαι 13 times, in 11 of which all of the other ingredients are in δραχμαί.[113] In No. 15 the oil is in λίτραι, as also 3 other ingredients, while the remaining 4 are in οὐγγίαι. In No. 18 the oil and 4 ingredients are in λίτραι and the remaining 3 in δραχμαί.[114]

9-15. A new recipe began in line 9, with a space left between lines 8 and 9, and with line 9 indented by 2.5 cm. Before the first word in line 9 are two elaborated paragraphoi, which were made by the scribe to further mark the beginning of the new recipe.

The new recipe is a μηλίνη, a yellow plaster.[115] For many recipes called μήλιναι ἔμπλαστροι see Gal. XIII 503-517. Of these recipes Galen says (503) ὥσπερ τῶν χλωρῶν ἐμπλάστρων αἱ πλεῖσται διὰ τὸν ἰὸν ἐπικρατοῦντα γίγνονται τοιαῦται, καὶ μάλιστα αὐτῶν αἱ εὐχροώτεραι, κατὰ τὸν αὐτὸν τρόπον καὶ αἱ μήλιναι. ἀλλ' αἱ μὲν χλωραὶ τὸν ἰὸν ἀνέψητον ἔχουσιν, αἱ μήλιναι δὲ ἑψόμενον μέν, ἀλλὰ μετρίως. ὡς ἐάν γε ἐπὶ πλέον ἑψῃς, τὰς καλουμένας ὑπ' ἐνίων μὲν διχρώμους ὑπ' ἐνίων δὲ κιρρὰς ἐργάσῃ. "Just as most of the greenish-yellow plasters become such by reason of the color-property of iron, especially those that are better colored, the yellow plasters become such in the same way. But the greenish-yellow plasters use unboiled iron, while the yellow use iron that is boiled, but only moderately. If you boil it more, it will make plasters that are called by some 'two-color' and by others 'orange-tawny'."

But iron is not an indispensable ingredient of a μηλίνη ἔμπλαστρος. Of the twenty-two μήλιναι which Galen cites in succession[116] only ten require iron, as in our line 13.[117] With respect to the four remaining ingredients preserved in our text (lines 10-12) - litharge, white lead, resin, and oil - litharge is present in all but two of the 22 μήλιναι recipes of Galen, and, with one exception, always comes first as in our text. White lead (ψιμύθιον) is found in only four of the recipes, but in 3 of them it follows directly

113) Nos. 1-8, 11, 12, 17. In No.9 oil and vinegar are in κοτύλαι, litharge in λίτραι, wax in μναῖ, and the remaining 7 ingredients in δραχμαί. In No.10 castor-oil and sea-water are in κοτύλαι and the remaining 7 ingredients in either δραχμαί or μναῖ.

114) In Nos. 13 and 14 all ingredients are in δραχμαί, and in No.16 all are in μναῖ.

115) The color is quince-yellow, as opposed to κιρρά, orange-tawny, ξανθός, gold, auburn, brownish-yellow, and πυρρός, yellowish-red.

116) In order, 505,6; 9; 11; 14; 506,1; 5; 7; 12; 14; 507,1; 5; 8; 12; 15; 18; 509,1; 16; 511,9; 512,2; 9; 515,16; 516,9.

117) ἰοῦ Nos. 4, 7, 16, 21, 22; ἰοῦ ξυστοῦ Nos. 1, 20; ἰοῦ σκώληκος Nos. 6, 10; ἰοῦ κυπρίου No. 17.

after litharge, again as in our text.[118] Resin, in some form, is found in 16 of the 22 μήλιναι.[119] Oil is found in all of them, with two exceptions,[120] and often ἐλαίου παλαιοῦ is specified, although not in line 12 of our text.

Of the two ingredients which are lost from lines 11 and 12 of our text, one of them must have been wax, since 18 of the 22 μήλιναι have κηροῦ.[121] It is provisionally supplied in line 12 (cf. note to the line, below). The other missing ingredient is more of a problem. Lines 10-12 have λιθ[αργύρου ψιμι]θίου πιτυΐνης α[±10] (λίτ.) ξ. The lacuna must have held either the name of an ingredient beginning with alpha, plus ἀνά, or ἀ[νὰ plus amount plus the name of an ingredient containing ca. 6 letters. Of the ingredients beginning with alpha among the 22 μήλιναι, 10 have ἀμμωνιακοῦ θυμιάματος,[122] which is too long for the lacuna. No.10 has ἀριστολοχίας, which is also too long, and No.11 has ἀξουγγίου. Of ingredients containing ca. 6 letters among the 22 μήλιναι, the only candidates are σμύρνης, λιβάνου, οἴνου, ὄξους.[123]

None of the 22 μήλιναι of Galen have all of the ingredients of our text. Of the ten recipes which call for ἰός and λιθάργυρος, e.g., not one calls also for ψιμύθιον. But among the thirty ἐπουλωτικαί of Galen, mentioned in B verso, note to lines 8-11, there is one (XIII 528,2ff.) which has all of our preserved ingredients except ἰός. It has the following: ἄλλη Τελαμῶνος φάρμακον ἐπιτετευγμένον, ποιεῖ καὶ πρὸς ἄνθρακας, ἀναξηραίνει κόλπους ἐνιεμένη καὶ ἐγχυματιζομένη, ἔστι δὲ καὶ ἐπουλωτικὴ ἀγαθή. "Another plaster, that of Telamon. It is a proved remedy. It is effective against carbuncles and when diluted and made into an infusion, it dries up fistulous ulcers. It is a good cicatrizing agent." The ingredients are πιτυΐνης, κηροῦ, ἀσβέστου, λιθαργύρου ἀνὰ (δρ.) ν, ψιμυθίου (δρ.) κε, ἐλαίου κοτύλης ἥμισυ. See the Table at the end of the commentary. The μήλιναι and other colored plasters which contain wax, resin, and oil, and large amounts of metals can also be ἐπουλωτικαί.[124]

9. Ṭ[ελαμώνιος] or Ṭ[ελαμῶνος]: The remnant of ink is the left end of a horizontal stroke at the right height for a tau. The parallel text of Aëtius in XV, p.130 has ἡ Τελαμώνιος λεγομένη. φάρμακον λευκὸν ἐπιτετευγμένον, ποιεῖ πρὸς ἄνθρακας, ἀναξηραίνει κόλπους ἀνιεμένη. ἔστι δὲ καὶ ἀπουλωτικὴ ἀγαθή.

118) Nos. 2, 3, 14, 15; in No.2 white lead is the last ingredient.

119) No.5 has πιτυΐνης, as in line 11 of our text; Nos. 3, 18, and 19 have ῥητίνης πιτ. or ῥητ. πιτ. ξηρᾶς; Nos. 1, 2, 4, 7, and 17 have either κολοφωνίας or ῥητ. κολ.; Nos. 14 and 15 have ῥητ. ξηρᾶς; Nos. 9, 10, 12, and 21 have τερμινθίνης or ῥητ. τερ.; while No.16 has τερ. διαυγοῦς.

120) Nos. 9 and 12 have no oil.

121) Wax is omitted from Nos. 2, 8, 11, and 13. No.3 calls for κηροῦ Τυρρηνικοῦ and No.18 for κηροῦ Ποντικοῦ.

122) Nos. 1-3, 7, 9, 19, 14-17.

123) σμύρνης Nos. 1, 4, 7, 9, 17; λιβάνου No.9; οἴνου Nos. 5, 18; ὄξους No.21.

124) Cf. Gal. XIII 460ff., 489, 496ff., 503ff.

The addition of iron in our line 13, which both Galen and Aëtius omit, changes the φάρμακον λευκόν to a φάρμακον μήλινον.[125)]

10-11. λιθ[αργύρου ψιμι]θίου πιτυΐνης ά[cβέcτου ἀνά]: Galen and Aëtius have πιτυΐ- κηροῦ ἀcβέc- λιθ- ἀνά. Cf. the Table of Ingredients and Amounts and notes to lines 9-15, 12.

11. ά[cβέcτου ἀνά]: Cf. note to lines 9-15. Among the thirty ἐπουλωτικαί of Galen, three have ἀcβέcτου: that of Telamon (XIII 528,2; see Table); that of Moschion (528,13; see Table) which has the same ingredients as that of Telamon, except for the omission of resin and the addition of deer-marrow; and the "panacea" of Andromachus (531,15) which has all of the ingredients of that of Telamon, but in very different proportions, plus six additional ingredients.

ά[cφάλτου ἀνά], which is also possible in our text, occurs three times among the thirty ἐπουλωτικαί but none of them has all of the preserved ingredients of our text.[126)] ἄcφαλτος did not occur in any of the twenty-two μήλιναι, mentioned above.

12. [κηροῦ (λίτ.) .]; The amount of wax may very well have been 6 lbs., the amount equivalent to that of litharge, resin, and unslaked lime, as in the Galen and Aëtius recipes. Cf. note to lines 10-11, above. The supplement in this line is slightly shorter than those in the preceding and following lines, but the greater part of the foregoing numeral ζ̄ is also in the lacuna.

13. [ἰ]οῦ ξυcτοῦ (οὐγ.) [.: For ἰόc see note to lines 9-15 and footnote 117, and cf. note to D, 11. Two of the μήλιναι, that of Menoites (509,1) and that of Crito (515,16) have the amounts of iron in ounces, as in our text. The pertinent ingredients are added to the Table at the end of the commentary for comparative purposes.

ποιῆ δὲ καί]: The supplement is illustrative. Cf. note to line 3, above.

14-15. The supplements are illustrative. Cf. the following: Gal. XIII 520,9, the κιρρὰ ἡ Ἴcιc ἱερά of Heras, ἡ διὰ δικτάμνου (cf. note to line 5, above, ad fin.), which has all of the ingredients of our recipe, except white lead and unslaked lime, for which other metals are substituted, has ποιεῖ ἐπὶ προcφάτων ἐναίμων, ῥευματικῶν, πρὸc νεύρων διακοπάc, παλαιὰ ἕλκη, ὑπόνομα, ... cηπεδόνας, ἄνθρακας, ... χίμεθλα, ἀποcτήματα, ... δοθιῆνας, cκληρίας ... θηρίων πληγὰc καὶ δήγματα cκορπίων. "It is effective against recent bloody wounds, discharges of humours, breaks of tendons, long-standing, spreading, and septic ulcers, carbuncles, chilblains, abscesses, boils, indurations, injuries caused by beasts and stings of scorpions." Aët. XV, p.37-8, has a χλωρὰ κολλητικὴ ἡ δι' ἀτρακτυλίδοc (spindle-thistle), which is good for τὰ ἔναιμα τραύματα ἐν παντὶ τόπῳ τοῦ cώματοc γιγνόμενα ... καὶ πρὸc τὰ παλαιὰ ἕλκη καὶ ἐκκοπὰc καὶ πληγὰc καὶ χρούcματα καὶ τὰ ἀπὸ ψύξεως ἐπαλγῆ,

125) Cf. Gal. XIII 496-7, and note to lines 9-15, above.

126) Nos. 5, 14, and 15 (525,10; 529,9,13) have no white lead or resin.

"for bloody wounds present on any part of the body, and for old ulcers, excisions, injuries, beatings, and painful conditions from (excessive) chilling;" p.42 has an ἔμπλαστρος ἡ ἑστία: αὕτη ποιεῖ πρὸς πᾶν τραῦμα ὡς οὐκ ἄλλο φάρμακον καὶ πρὸς νευροτρώτους ... ποιεῖ πρὸς τὰς τῶν ἰοβόλων πληγάς. "The plaster Hestia: this is effective against every wound as no other medication, and against injuries to the tendons. It is good for wounds caused by venomous animals." P. 48-9, a κιρρά of Halieus, has αὕτη ποιεῖ πρὸς τὰ ἕναιμα τῶν τραυμάτων ... ἐπὶ τῶν κυνοδήκτων καὶ ἀνθρωποδήκτων. ἄκρως ποιεῖ καὶ πρὸς τρυγόνων θαλασσίων καὶ δρακόντων καὶ τῶν ἄλλων χαλεπῶν ἰχθύων πληγάς, καὶ καθόλου δὲ δυνάμεως θαυμαστῆς ἐστιν. "This is effective for bloody wounds and for those bitten by dogs or by humans. Above all, it is good for the strikes of sting-rays of the sea, serpents, and other dangerous fish. It has altogether a wonderful power." Cf. p. 50,15ff.

Table of Ingredients and Amounts

	Mich. Inv.21 E,9-15	Gal. XIII 528,2	Aët. XV p.130	Gal. XIII 528,15	Gal. XIII 509,1	Gal. XIII 515,16
litharge	6 lbs.	50 dr.	8 dr.	8 dr.	4 lbs.	4 lbs.
white lead	6 lbs.	25 dr.	25 dr.	8 dr.		
pine resin	6 lbs.	50 dr.	8 dr.		2 lbs.	8 oz. (=2/3 lb.)
unslaked lime	6 lbs.	50 dr.	8 dr.	8 dr.		
oil	6 lbs.	50 dr.[128]	50 dr.[129]	enough	3 lbs.	2 ξέ. (=1lb.)
wax	[6 lbs.][127]	50 dr.	8 dr.	16 dr.	1 lb.	4 lbs.
iron rust	[ ] oz.				4 oz. (=1/3 lb.)	8 oz. (=2/3 lb.)

The ratio of the ingredients of 21 E, 9-15, to those of the Telamon recipe of Galen (528,2) is 12:1, with the exception of white lead.[130] In the Telamon recipe of Aëtius (XV, p.130), which should be an exact duplicate of that of Galen (cf. notes to lines 9-15, ad fin., 9, and 10-11), the text has an obvious

127) For the probable amount of wax in E as 6 lbs., see the note to line 12, above.

128) The Telamon recipe of Galen has ἐλαίου κοτύλης ἥμισυ (= one-half pound = 50 dr.). For the rounding out of 48 dr. to 50 dr., see 21 D, footnote 91; and for 1 kotyle = 1 pound = 12 ounces, see C verso, footnote 78.

129) The Telamon recipe of Aëtius has ἐλαίου λίτραν ἡμίσειαν. See the preceding footnote.

130) White lead is frequently found having the same amount as litharge: cf. A, 10-11, and Nos. 14 and 15 of the 22 μήλιναι (507,15, 18), and nine of the 30 ἐπουλωτικαί (525,2; 526,7:17; 527,12-13; 528,15; 529,16; 530,18; 533,1; 12). In another of the ἐπουλωτικαί (531,5) the amount of litharge is 100 dr., and of white lead, 50 dr., the same ratio as in the Telamon recipe in our Table.

error, with apparently no MS variation. The scribal blunder in a single numeral, H in place of N (= 8 in place of 50), has resulted in false amounts for four ingredients.

The two μήλιναι, that of Menoites and that of Crito (509,1; 515,16), are added to the Table as examples of the relative proportion of iron to the other ingredients.[131)]

Inv. 21 E verso 9.3 x 13.5 cm.

Plate 5b

- - - - - - - - - - - - - - - - - -

].αν..[

]ανου (οὐγ.) α ῥοδί-

[νου κοτ( ) .] μαρουλίου (οὐγ.) γ (λίτ.)

4 [κηροῦ ..] ἰοῦ (λίτ.) δ τήλε-

[ως .. ἰτ]έας ῥίζζης (λίτ.) ϛ̄

[κολοφων]ίας (οὐγ.) ς βάλε

[τῆλιν καὶ] ῥίζζαν ἰτέας

8 [ἐκπεπιε]σμένην [εἰς] ἔλεον

τὸ

[ἐπὶ δὲ πῦ]ρ ἕψε μέχρι ἂν ὑ-

[πολειφθῇ δ]ακτύλους δ̄

[ξηρὰ δὲ ἐπι]πάσσων ‹εἰ›ς χυ-

12 [λὸν καὶ συνε]νώσας ἐπ' ὀθόνι-

[ον διηθήσα]ς καὶ στήσας

]..ξοντ..[..]

].μαλα[

16]..[

- - - - - - - - - - - - - - - - - -

3,6. Pap. Γο ↑ 5. ῥίζης 7. ῥίζαν 8. ἔλαιον

Translation

... 1 ounce of rue (?), ... kotylae of rose oil, 3 ounces or pounds of lettuce, ... of wax, 4 lbs. of iron rust, ... of fenugreek, 6 lbs. of willow root, 6 oz. of kolophonian resin. Add the fenugreek and the expressed juice of willow root to the oil and boil over a fire until four "fingers" are left remaining. Then sprinkle the dried ingredients over the liquid, mix together and strain through a linen cloth. Raise it ...

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131) Not included in the Table are several ingredients which do not appear in our text: deer marrow in the ἐπουλωτική of Moschion (528,15); frankincense, all-heal, and ammoniac incense in the μηλίνη of Menoites (509,1); and vinegar in the μηλίνη of Crito (515,16).

1. This line and preceding lines probably contained the first ingredients of the current recipe. Cf. note to line 4.

2.]ανου: πηγ]άνου, rue, is the most likely ingredient here; cf. C, 7. But other ingredients cannot be excluded.[132)]

2-3. ῥοδί[νου: sc. ἐλαίου. Cf. ἔλεον in line 8. For rose oil used in plasters see C verso, 2, where ἐλαίου is also omitted, and H, 4. After ῥοδί[νου there is space for 4 letters before μαρουλίου. For oil measured in κοτύλαι see B verso, 11; D, 14, with note ad loc.; L, 4; and for λίτραι, E, 12.

3. μαρουλίου = θρίδακος or θριδακίνης, lettuce. The word has not occurred in papyri and was seemingly not known prior to the fourth century. For references to μαρούλιον and μαϊούλιον, both with variant endings, cf. LSJ, s. vv.; Hesychius, ed. J.Albertus, s.v. θριδακίναι, with notes 4 and 5; DuCang, Gloss. Gr., s.v. μαρούλιον, with copious, very informative notes.

Alexander Trallianus, writing in the sixth century, has μαρούλια as an equivalent of θριδακίναι and as a separate vegetable (or vegetables) apart from θριδακίναι. Cf. II 61,6, where a simple diet includes μαρούλια καὶ θριδακίνας καὶ ἴντυβα, rendered by the editor, T.Puschmann, "Marulia-Salat, Lattich und Endivien"; while II 593,18 has τὰ ἴντυβα καὶ τὰς θριδακίνας τὰ καλούμενα μαρούλια, "Endivien und den sogenannten Marulia-Salat." μαρούλια is thus an inclusive word, designating a number of leafy "greens" which are commonly used in salads. Cf. Geop. 12.1.2, μαρούλια διάφορα, "different kinds of lettuce," which are to be planted in February, along with leeks, onions, beets, etc.[133)]

Although Galen, writing in the second century, says that all the Greeks "now" reserve the word θριδακίνη for wild lettuce,[134)] and although μαρούλιον is equivalent to θριδακίνη, the word μαρούλιον is not used for wild lettuce. In DuCang, op.cit., τρόξιμον (τρωξ-) is cited as equivalent to τὸ ἄγριον μαρούλιον or τὸ ἀγριομαρούλιν, and σέρις[135)] as equivalent to τὸ κιχώριον, ἤτοι τὸ ἀγριοματούλιον.

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132) Cf. Gal. VI 638 for πήγανον, ὀρίγανον, and κορίανον as plants with the same properties as κρόμμυα, σκόροδα, πράσα, et al. λίβανος is found in a powder for gout in Alex. Trall. II 545, which also contains ἰτέα and τῆλις among its forty-nine ingredients.

133) μαρούλια διάφορα is followed by τουτέστι δικάρδιν, φρυγιατικόν, ῥιγιτανόν, καὶ κράμβη λευκή, κτλ. In LSJ δικάρδιον is "a kind of lettuce"; φρυγιατικόν, "an unknown plant"; and ῥιγίτανον, the "name of a plant." φρυγιατικόν may perhaps be a Phrygian-type lettuce.

134) Gal. XIII 387, ὁ τῆς θριδακίνης χυλὸς, ὅ τε τῆς ἀγρίας καὶ ὁ τῆς κηπευομένης, ἣν ἅπαντες οἱ Ἕλληνες οἱ νῦν οὐ θριδακίνην, ἀλλὰ θρίδακα προσαγορεύουσι, τὴν ἀγρίαν μόνην θριδακίνην ὀνομάζοντες. Cf. also VI 626-7, 794; XII 509. (I owe the references, with many thanks, to Ann Ellis Hanson). Dioscorides, writing in the first century, uses only θρίδαξ, ἀγρίας or ἥμερος (II 136). In his list of "simples" Galen likewise has only θρίδαξ and θ. ἀγρία (XI 887), as do also Aëtius (I 165) and Paulus (VII 3).

135) I.e. σέρις ἀγρία. Cf. Dsc. II 132 and 107.2; Gal. VI 794 and XII 119. Cf. also D verso, 3, of our codex.

For a drawing of θρίδαξ ἥμερος = μαρούλιον and of θρίδαξ ἀγρία = ἀγριο-μαρούλιον, see The Greek Herbal of Dioscorides, translated by John Goodyear (1655), ed. R.T.Gunther (1934) with illustrations by a Byzantine artist (ca. 512 A.D.), pp.176-177.

In Modern Greek the word for lettuce is μαρούλι, τό, with compounds μαρουλόσπορος, -φυλλο, -σαλάτα. θρίδαξ, ὁ, is also used, but primarily as a botanical designation.[136)]

The amount of lettuce at the end of line 3 of our text is Γο γ = 3 oz. But immediately beneath Γο, and touching it, the scribe has placed the symbol for lbs.,↑, as if he had omitted οἱ δὲ (λίτ.) γ which was in his exemplar. Cf. D, 14. Our scribe was again careless in line 11 where he dropped two letters from the text.

4. [κηροῦ ..] ἰοῦ: The supplement is illustrative, based on the recipe for a plaster called ἡ διὰ ἰτέων which is found in Gal. XIII 740; 800; Aët. XV, p.60; Paul. VII 17.43. All of the recipes have the same 15-17 ingredients, but with varying amounts. They include ἐλαίου, κηροῦ, ἰοῦ, ἰτέας and κολοφωνίας (ῥητίνης), but have nothing corresponding to our]ανου, μαρουλίου, or τήλεως (lines 2-4).

4-5. τήλε[ως: For τῆλις, fenugreek, see Dsc. II 102; Gal. XII 141. For its occurrence in medical papyri see Marganne, p.371.

5. ἰτ]έας ῥίζζης (ῥίζης), root of willow. For juice of willow and for the uses of the various parts of the willow tree, see D verso, 9, note. Galen seemingly has no instance of the use of the root of willow. But Alexander Trallianus, II 545,9, cites a decoction, ἀφέψημα ῥίζης ἰτέας φλοιοῦ, to be used in medications for gout after the inflamed parts have begun to perspire from other medication. And Aëtius includes the root of willow in a list of common emetic aids to be used in cases of dysentery (IX 42,312, in Athena 23, 1911, 388,6). I owe with thanks a computer printout of all the examples of ἰτέα in Aëtius and Paulus to Ann Ellis Hanson. Cf. D verso, footnote 97.

6. [κολοφων]ίας: The supplement is illustrative; see note to line 4, above. [στυπτηρ]ίας is also possible. It is a frequently found ingredient in the plasters for ulcers, either by itself or with σχιστῆς, στρογγύλης, or ὑγρᾶς. Both στυπ. σχιστ. and στυπ. στρογ. are included in the recipe, ἡ διὰ ἰτέων, mentioned in the note to line 4. Also included is μελαντηρίας which is too long for the lacuna in our text.

6-10. βάλε ... δ]ακτύλους δ̄: For the supplements cf. Gal. XIII 741, 6ff., where the directions for making the dark plaster with willow, μέλαινα ἡ διὰ ἰτεῶν, include the following: τὰ φύλλα τῆς ἰτέας εἰς ὄξος βαλὼν καὶ θεὶς ἐπὶ τὸ πῦρ ἕψε, κινῶν συνεχῶς ἕως τὸ τρίτον τῷ ὑγρῷ ὑπολειφθῇ. "Add the willow leaves to the vinegar, place over a fire and boil, stirring continuously,

136) Cf. W.Crighton, Μεγα Ἑλληνο-Ἀγγλικον Λέξικον, 1960. In the English-Greek section of Diury's Modern Desk Dictionary, 1971, λέτις is given, as well as μαροῦλι, s.v. lettuce; but λέτις is not found in the Greek-English section.

until there is left remaining one-third of the liquid." The directions for the willow recipe on p. 800,16, have τὰς ἰτέας μετ' ὄξους ἕως λειφθῶσι ξέσται β̄ ἕψε, εἶτα ἰῷ προλελειοτριβημένῳ καὶ ψιμυθίῳ καὶ μελαντηρίᾳ ἐπίβαλλε τὰ φύλλα καὶ συλλειοτρίβει, εἶτα τὰ ξηρὰ λεῖα καὶ πάλιν χύλωσον, εἶτα τὰ τηκτὰ ἐπικατάχει. "Boil the willow leaves with the vinegar until two sextarii remain, then add the leaves to the previously finely pounded iron, the white lead and black pigment, and triturate together. Then make into a liquid again the dried and pounded ingredients and pour over the melted ingredients."[137] Aëtius gives the method for extracting the juice from the leaves (XV, p. 61,9): They are first pounded in wine, then ἑψήσας ἐπὶ πυρὸς μαλακοῦ ἐπὶ πλείονα χρόνον, διήθει δι' ὀθόνης πυκνῆς, καὶ ἐκπιέσας τὰ φύλλα ῥίπτε, τὸν δὲ χυλὸν φύλαττε εἰς τὴν σκευασίαν. "Boil over a low fire for some time, then strain through a closely-woven linen cloth and press out the juice. Discard the leaves and save the liquid for the preparation of the recipe."

For τῆλις and ῥίζα ἀλθαίας boiled in oil, cf. Aët. XV, p. 15, 16-17, a plaster for indurations, ἐναφεψῶ δ' ἐνίοτε τῷ ἐλαίῳ καὶ τῆλιν καὶ ἀλθαίας ῥίζαν, κτλ., "sometimes I boil down fenugreek and the root of marsh mallow in oil." Another recipe of Aëtius, p. 73, ἡ διὰ τῆς ἀλθαίας Πόλητος, calls for the bark of the root of marsh mallow and gives directions for extracting the juice from it. The bark is taken at the height of the flowering season, pounded fine, and marinated in white wine for three days. The final direction (line 6) is ὀλμοκοπήσας πάλιν, ἐκπίεζε δι' ὀθονίου τὸν χυλὸν ἰσχυρῶς. "Pound again in a mortar and squeeze out the juice forcibly through a linen cloth."

8. [ἐκπεπιε]σμένην: Also possible is [λελεια]σμένην. Cf. Paul. VII 17.23, a recipe for a plaster containing δρακοντίου ῥίζα, root of edder-wort. The direction for preparing it is ἡ ῥίζα ξηρὰ λεία τοῖς ἄλλοις ἐπιπάσσεται λυθεῖσιν, "the root is dried, pounded, and sprinkled over the other dissolved ingredients." Another recipe of Paulus, No. 30, has the following: τούτοις τακεῖσιν ἐπιπάττειν τῆς πορφυρᾶς ἀγχούσης τῆς ῥίζης ξηρᾶς λειοτάτης (οὐγ.) δ̄. "Sprinkle over the melted ingredients four ounces of dried and finely pounded root of purple alkanet."

10. δ]ακτύλους: The word is here used as a measure equalling a finger's breadth, or approximately seven-tenths of an inch (LSJ, s.v., II, with references). Cf. Gal. XII 992,6, (πρὸς ἄφθας) ἁρμόζει καὶ δοῦς ὁ ἐπὶ τὰ ὄψα μετὰ μίνθης κλωνίων. ἔστω δὲ τοῦ μὲν δοῦ πλῆθος ὅσον τοῖς τρισὶ δακτύλοις, τῆς δὲ μίνθης κλωνία τρία, κτλ. "For aphthai[138] a suitable treatment is sumach, that used for cooking, with twigs of mint. Let the amount of sumach be rather more than (can be taken) in three fingers, and that of mint three twigs." Cf. Aët. XV, pp. 32,11; 107,14.

137) The uses for these recipes are given in D verso, 9, note.

138) See D verso, note to lines 2-3.

A fragment from a roll of medical recipes of the Hellenistic period also measures by fingers. P.Ryl. III 531, 13f. has πρὸς τοὺς ἀπὸ τῶν ὑστερῶν πνιγμοὺς ἐνύδριδος τοὺς νεφροὺς ξηράνας δίδου ὅσον τοῖς τρισὶν δακτύλοις λαβεῖν ἐν οἴνῳ εὐώδει. "For hysterical choking, give dried otter's kidneys, as much as can be taken in three fingers (= 'a pinch'), in fragrant wine."

11-12. [ξηρὰ δὲ ἐπι]πάσσων ‹εἰ›ς χυ[λόν: Cf. Aët. XV, p. 108,4, the brief direction for making up an anodyne recipe: τήξας τὰ τηκτὰ ἐπίπασσε τὰ ξηρὰ λειότατα, "melt the soluble ingredients and sprinkle over them the finely pounded dry ingredients." The final direction for a cicatrizing plaster of Andromachus, Aët. XV, p. 113,10, is the following: καὶ ἆρας ἀπὸ τοῦ πυρὸς ἐπίπασσε τὰ ξηρὰ λειότατα γενόμενα, καὶ μαλάξας χρῶ. "Lift it from the fire, and sprinkle over it the dried ingredients which have been finely pounded. Make it supple and use." Cf. also the final direction for the recipe on p. 75, 9: καὶ ἆρας ἐπίπασσε τὴν θλάσπιν καὶ τὸ χαμαίμηλον, καὶ ἑνώσας ἐπίχεε εἰς θυίαν ὕδωρ ἔχουσαν ψυχρὸν, καὶ μαλάξας χρῶ. "Raise it (from the fire) and sprinkle over it the (dried) shepherd's purse and camomile. Mix and pour into a mortar holding cold water. Make it malleable and use."

12-13. ἐ̣π̣' ὀθόνι[ον διηθήσα]ς: δι' ὀθονίου is expected here, as, e.g., in Aët. XV, p. 70,20, ἕψε μέχρι πάχος ἱκανὸν λάβῃ, καὶ διηθήσας δι' ὀθονίου χρῶ εἰς τὴν τοῦ φαρμάκου σκευασίαν. "Boil until it takes on a proper consistency. Strain through a linen cloth and use in the preparation of the medication."

13. στήσας: Cf. Aët. XV, p.44, 15ff.: καὶ διηθήσας ὡς καθαρὸν αὐτὸ γενέσθαι, στήσας τὰς δύο λίτρας, ἐπίβαλλε τοῖς ἐν τῇ θυίᾳ, "having strained (the axunge) until it becomes clean, raise the two pounds and add them to the ingredients in the mortar."

14.]..ξοντ..[..]: possibly] τ̣ή̣ξον τηκ̣[τά]; see Gal. XIII 788,13, τὰ δὲ τηκτὰ ἐν ἑτέρῳ ἀγγείῳ τήξον, προεψήσας κτλ. "Melt the soluble ingredients in another vessel, having previously boiled them."

15.].μαλα[: possibly κα]ὶ̣ μαλά[ξας χρῶ. See note to lines 11-12, above.

P.Mich. Inv. 21 F 7.5 x 11.5 cm.

Plate 6a

- - - - - - - - - - - - - - -
] ἐστιν κ[± 6]
[....]...τασετε [± 6]
.νου καὶ διὰ κλυς[μάτων ἱά-]
4 εται παρελοῦσα [τοὺς πό-]
νους τῶν ἐντερο[κήλων]
ποιῖ δὲ πρὸς ἀπο[στήματα]
κὲ δοθιῶνας καὶ [πρὸς ἐμ-]
8 πνευματώσις τε [καὶ χίμετ-]
λα
ἔνπλαστρος ἡ φοιν[ικίνη καὶ]
κολλητικὴ καὶ συ[νουλωτικὴ]
12 ἑλκῶν καὶ φλεγμ[ονῶν ἐπει-]
δὰν τακεῖσα σύ[στασιν κη-]
ρωτῆς ἔχῃ ὑγ[ρᾶς
- - - - - - - - - - - - - - -

6. ποιεῖ 7. καὶ δοθιόνας 8. -πνευματώσεις 10. ἔμπλαστρος

Translation

... It is a good discutient (?) plaster, effective for other conditions of the same kind (?) and with spongewashings it is healing, taking away the pains of intestinal hernias. It is also good for abscesses, boils, abnormal inflations, and chilblains.

The date-palm plaster agglutinates and promotes cicatrization of ulcers and (is a treatment for) inflammations when, having been melted, it has the consistency of a moist cerate. ...

1-9. These lines contain the uses, or additional uses, of a preceding recipe. They are reminiscent of the affections treated by Galen in his Περὶ τῶν παρὰ φύσιν ὄγκων, "On abnormal swellings" (VII 705-732).[139] Cf. esp. pp.718-719 for ἀποστήματα and πνευματώσεις (see lines 6 and 8, above). A recipe of Aëtius, ἡ διὰ γύρεως, "the plaster with finest meal" (XV, p.85),

139) Translations are found by D.G.Lytton and L.M.Resuhr in the Journal of the History of Medicine 33, 1978, 531-549, and by J.Reedy, University of Michigan Doctoral Dissertation, April, 1968.

has πρὸς ἀποστήματα καὶ δοθιῆνας ποιοῦσα καὶ πρὸς ἐντεροκήλας κτλ. (cf. lines 5-7, above).

1. An illustrative supplement might be the following: διαφο|ρητικὴ δ'] ἐστιν κ[αλή. ποιῖ| καὶ π]ρὸς τὰς ἑτέ[ρας (sc. διαθέσεις) τοῦ | γ]ένου, "It is a good discutient plaster; it is effective for other conditions of the (same) kind." Cf. Aët. XV, p. 100, where a plaster is described as διαφορητικὴ ἀποστημάτων παράδοξος, "the wondrous dispersing plaster for abscesses." If the letter following ἐστιν is the vowel eta, the text may have had ἡ [αὕτη. Cf. A, 13.

3-4. διὰ κλυσ[μάτων ἱά]εται: In Gal. X 577 the treatment for ἐμπνευμάτωσις is ἤτοι διὰ τῶν προσθέτων ἢ διὰ κλυσμάτων πράξεων, "either with applications or gentle washings." The washing-liquid is made of honey, oil and water, but if a biting (δῆξις) is present a suitable application is a mixture of Sabinum-oil, goose fat, and wax. Galen continues (577-578) τὰς δὲ ἐμπνευματώσεις ἰᾶσθαι συνέψοντας τῷ ἐλαίῳ πηγάνου τέ τι καὶ τῶν ἀφύσων σπερμάτων σελίνου καὶ κυμίνου καὶ μαράθρου καὶ σίνωνος, ὅσα τ' ἄλλα τοιαῦτα. "To heal abnormal inflation, boil together in oil, rue and non-flatulence-producing seeds, those of celery, cummin, fennel, stone parsley and other such seeds."

ἱά]εται is a likely supplement here, although ἰᾶται would be more usual. Cf. A, 13 and B verso, 4. The verb must be short and the only alternative would appear to be λύ]εται, in which case the subject could not be "the plaster" or "application."

5. ἐντερο[κήλων, intestinal hernias: The curved left half of omicron is on the broken edge of the papyrus. Beneath it is an oblique stroke, 2 mm. to the right of the tail of rho, but possibly intended to mark the abbreviation ἐντέρ(ων),[140] sometimes used alone to designate bowels, intestines, or stomach. The doubtful omicron could also be part of an omega, in which case ἐντέρων was written out and perhaps followed by καί. I incline to think the oblique was accidental, since ἐντεροκήλαι is found with two of the succeeding ailments in our text, ἀποστήματα and δοθιόνες, in Aët. XV, p.85 (cf. note to lines 1-9, above). On recipes for intestinal hernias see Aët. XV, p. 85; Paul. III 53; Orib. Fr. 85 (IV 603, 14). Cf. Celsus VII 18.3 for a description of the condition which "the Greeks call enterocelen et epiplocelen, apud nos indecorum sed commune his hirneae nomen est."

6. ἀπο[στήματα], abscesses: Cf. note to lines 1-9, above. Possible also, but less likely, is ἀπο[σύρματα], bruises, excoriations, minor ulcers. Cf. Gal. XIII 399, 16; 417, 18; Paul. IV 14; VII 17.16.

7. κέ = καί. So spelled in C verso, 8; D verso, 7, 11. For κέ in the same text (and line) with καί, see ZPE 27, 1977, 141, note to lines 5-6.

140) An oblique after rho, to mark an abbreviation, is usually found through the tail of rho, and slanting down from right to left rather than from left to right, as here.

δοθιῶνος (δοθιόνας) = δοθιῆνας, small abscesses, boils. See LSJ, s.v. δοθιών, for the spelling in the first and second centuries. Cf. Paul. IV 23 περὶ δοθιήνων. καὶ ὁ δοθιὴν ὄγκος ἐστὶν ἀποστηματώδης ἐκ παχέων χυμῶν ἐν τοῖς σαρκώδεσι μάλιστα τόποις συνιστάμενος, κτλ. "A dothiēn is an abscess-type swelling formed of thick humours especially in the fleshy parts of the body."[141] Particularly recommended is the application called "the Dothiēnicon"[142] (cf. VII 17.10, ἡ δοθιήνη). δοθιῆναι are found together with ἀποστήματα and ἐντεροκῆλαι, et al. in Aët. XV, p. 85, and together with ἀποστήματα and χίμετλα, et al. in Gal. XIII 778, 15.

7-8. καὶ [πρὸς ἐμ]πνευματώσις (-ώσεις): Nine letters in the lacuna, as e.g. [ἕρπητας κὲ] or [σκίρους κὲ], herpes or hardened tumors, would probably make the line too long.[143]

ἐμπνευμάτωσις and πνευμάτωσις seem to have been used interchangeably by the medical writers. For a definition of ἐμπνευμάτωσις see Gal. XIX 419, ὅρος ἰατρικός 258; and cf. Orib.Coll. incer.46 (IV 557, 23) περὶ ἐμπνευματώσεως στομάχου; Coll. incer. 59 (574, 7) περὶ πνευματώσεως; Paul. III 70 περὶ ἐμπνευματώσεως (μήτρας). For medications, see e.g. Dsc. Eupor. II 12; Gal. VIII 389, 14; XIII 973, 11; and cf. notes to lines 1-9 and 3-4, above.[144]

8-9. [καὶ χίμετ]λα, chilblains: For the supplement see note to line 7, above, ad fin. The word is both neuter and feminine and spelled with either tau or theta. It is found again in our codex in H verso, 5, τὰς χιμέτλας, with τ corrected from θ. Cf. Paul. III 79.1 πρὸς χίμετλα καὶ τὰ ἐν πέλμασι καὶ πτέρναις. τὰ χίμετλα ἑλκώδεις εἰσὶ διαθέσεις περὶ τοὺς δακτύλους τῶν χειρῶν καὶ ποδῶν συνιστάμενα χειμῶνος ὥρᾳ. "On chilblains and affections of the feet and heels. Chilblains are ulcerous conditions forming on the fingers and toes in the winter season." Many remedies follow and are continued in 79.2, Μαρκέλλιον πρὸς χίμετλα, where the app.crit. has χίμετλαν AEH, χείμετλαν M, -ν eras. B. Dsc. Eupor. I 171 has χίμετλα δὲ ἶᾶται καταντλούμενα· κτλ. The variant spellings of the MSS are χείμετλα, <χ>ύμετλα, χείμεθλα (τ super-scr.). Oribasius prefers the spelling with theta. Cf. Coll.Med.incer. 102 (IV 615, 19) πρὸς χιμέθλας κακοήθεις ... ἐπὶ δὲ χιμέθλων κτλ.; incer. 109 (IV 620) περὶ χιμέθλων; Syn. VII 45 (V 391) πρὸς χείμεθλα; also Gal. XIII 380, 5 ἐν χειμέθλοις; 383, 17 τῶν ἑλκωθέντων χειμέθλων.

10. A new recipe begins in this line. The line was not indented, nor a space left before it; but there is a short paragraphos beneath the two letters of line 9 and the remainder of the line is filled with elaborated forked

141) Cf. Orib. Coll. XLIV 32-33 (III 673-675), Syn. VII 41 (V 388).

142) In the app.crit.: δοθηνικόν ADE, δοθηνικόν F, δοθιονικόν GHKM, e corr. B.

143) These affections are the shortest of those listed in Gal. VII 718-719, together with ἀποστήματα and πνευματώσεις, et al. Cf. note to lines 1-9, above.

144) I owe to Ann Ellis Hanson, with many thanks, a computer printout of all the examples of ἐμπνευμάτωσις in Galen.

paragraphoi. The new recipe is "the phoinikinē" or date-palm plaster. It is a well-known recipe found in the ancient medical writers. Our text is taken almost verbatim from Gal. XIII 375: περὶ τοῦ διὰ χαλκίτεως ἐμπλαστοῦ φαρμάκου. τίνι λόγῳ συνέθηκα τὴν διὰ χαλκίτεως ἔμπλαστρον, ἣν φοινικίνην ὀνομάζω, κολλητικήν τε καὶ συνουλωτικὴν ἑλκῶν καὶ φλεγμονῶν θεραπευτικήν, ἐπειδὰν τακεῖσα σύστασιν ὑγρᾶς ἔχῃ κηρωτῆς, κτλ. "Concerning the medicated plaster with copper. I have made up in the following way the plaster with copper, which I call 'the date-palm', which agglutinates and promotes cicatrization of ulcers and is a treatment for inflammations when, having been melted, it has the consistency of a moist cerate."

Our text breaks off at that point, but, alone among the six fragments, 21 A-F, the text can be shown to have continued onto the verso side,[145] with the list of ingredients and amounts lost at the bottom of F or the top of F verso. The verso is in truly horrendous condition and, without the description of the preparation of the recipe in Galen very few letters could have been read with any certainty. See F verso, 2-6 and notes ad loc.

In addition to Gal. XIII 375 ff., the recipe is found in Orib. Syn. III 5 (V 97-98); Aët. XV, pp. 44-45; and Paul. VII 17.29. Oribasius and Aëtius call their recipe ἡ φοινικίνη Γαληνοῦ and repeat or paraphrase in some detail the minute directions of Galen. Paulus calls his recipe simply ἡ φοινικίνη and the recipe and directions together require only six lines. The ingredients are the same in all of the texts: 2 lbs. of suet, 3 lbs. each of oil and litharge, and 4 oz. of copper.[146] Paulus gives the order of the addition of the ingredients in a mortar (εἰς ἰγδίον), and concludes his recipe with the following: καὶ μετὰ τὸ καλῶς λειωθῆναι ἕψει ἐπὶ μαλθακοῦ πυρὸς ἕως ἀμολύντου σπαθίζων ταῖς τῶν φοινίκων ῥάβδοις. "After the ingredients are well pounded, boil over a low fire until it ceases to stain, stirring with branches of date-palm." Cf. F verso, 1 ff.

12. καὶ φλεγμ[ονῶν: Galen has κ. φ. θεραπευτικήν (375, 4), and, at the end of the recipe where its uses are delineated (380, 3), ἐπὶ τῶν φλεγμαινόντων (ἑλκῶν), "inflamed ulcers." Cf. Orib. Syn. III 5 (V 98, 12); Aët. XV, p. 45, 12.

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145) Cf. note to A, 2-4, ad fin.

146) Paulus has 6 oz. Galen explains that the use of 6 oz. of copper, in place of 4 oz., will produce a medication more agglutinative for larger wounds and more cicatrizing for hard-to-cicatrize ulcers, but it is not suitable for treating inflammations (XIII 380, 10; also Aët. XV, p. 45, 16).

Inv. 21 F verso 7.5 x 11.5 cm.

Plate 6b

- - - - - - - - - - - - - - - - -

]...[

[4-5]κιν. cυνεχὲς δὲ π[ρο-]

[περι]ξύcας τὸν φλοιὸν

4 [δὲ κα]ὶ εἰς λ[ε]πτὰ κατα-

[τεμνῶ]ν ἔνβαλλε εἰς τὴν

[κακάβ]ην .[....].[...].[...]

[4-5].....[..]cκα[..]

8].....[...]...[....]

τ]ῷ μέρ[ει λοιπ]ῷ χρῶ

]..[...]ερια.[...]

]....[..]α καὶ δια

12].α[.]α.τηρ`ι´α.`ια´

].[.].....

]..

- - - - - - - - - - - - - - - - -

5 ἔμβαλλε

Translation

... Having first thoroughly scraped off the bark all around, cut it into fine pieces and cast them into the earthen pot ...

1ff. These lines contained the directions for introducing the juice of date-palm wood into the medication called the φοινικίνη, the recipe of which began on the recto side of the papyrus. See note to F, 10.

The pertinent parallels are found in Gal. XIII 378-379; Orib. Syn. III 5 (V 97-98); Aët. XV, pp. 44-45. The text of Aëtius has the following (p. 44, 18): ἀρκέcει δέ coι εἰc κλάδοc τῶν μεγάλων εἰc τὸ τῷ μὲν ἀδροτέρῳ μέρει εἰc τὴν κίνηcιν ἀντὶ cπάθηc κεχρῆcθαι, τοῦ δ' ἑτέρου τοῦ λεπτοτέρου καθάραc καὶ λεπίcαc τὸν φλοιὸν καὶ εἰc λεπτὰ κατατεμών, ἔμβαλλε τῷ φαρμάκῳ, ἵνα μεταδῷc τοῦ κατ' αὐτὸν χυλοῦ. ἐμβεβλήcθω δὲ κατ' ἐκεῖνον τὸν καιρὸν τὰ τῆc φοίνικοc τμήματα, καθ' ὃν τὸ φάρμακον ἔχει κηρωτῆc cύμμετρον cύcταcιν· ἐὰν γὰρ ἀπ' ἀρχῆc βληθῇ, καταναλίcκεται διὰ τῆc ἑψήcεωc ὁ χυλὸc αὐτοῦ, ὃν βουλόμεθα ἐπὶ πλέον μεῖναι διὰ τὴν ἐν αὐτῷ cτύψιν· καὶ αὐτῆc δὲ τῆc cπάθηc ἐφ' ᾗ κινεῖται τὸ φάρμακον, τὸν κατὰ βραχὺ ἀναξηραινόμενον ἐν τῇ ἑψήcει κλάδον κατὰ βραχὺ ἀποτέμνων καὶ ἀπορρίπτων, τῷ καταλοίπῳ μέρει χρῶ. "To help you: one of the larger branches with a stouter part is to be used for the stirring in place of a spathe. And having cleaned and peeled off the bark of another thinner branch, cut it into fine pieces and add them to the medication, so that you distribute the juice through it. The cuttings of date-palm should be added at the time when the medication has a consistency commensurate with a cerate. For if they are added at the beginning, their juice will be consumed through

the boiling, and we wish the juice to remain longer with the astringency in it. And, cutting off little by little the branch of the spathe itself, with which the medication is being stirred, and which is being consumed in the boiling little by little, throw it away and use the part left remaining."

Galen has (378, 15): ἀρκέσει δέ σοι κλάδος εἷς τῶν μεγάλων, ὡς τῷ μὲν ἁδρῷ μέρει τοῦ ξύλου χρῆσθαι κινοῦντα, κατὰ τὴν τῆς καλουμένης σπάθης χρείαν· οὕτω γὰρ ὀνομάζουσιν ᾧ κινοῦσι τὰ σκευαζόμενα, καὶ ἡμεῖς τοῦ σαφοῦς ἐχόμενοι καλέσομεν ὡσαύτως αὐτοῖς. τὸ δὲ συνεχὲς τῷ ἁδρῷ μέρει τοῦ κλάδου περικαθήρας καὶ τὰς ἑκατέρωθεν ἐκφύσεις τὰς λεπτὰς ἀποτρίψας κατάτεμνε, προπεριξύσας τὸν φλοιὸν, ὅπως ἐμβληθέντα τὰ τμήματα τῷ φαρμάκῳ μεταδῷ τοῦ καθ' ἑαυτὰ χυλοῦ. "To help you: one of the larger branches, with a fat part of wood, is to be used for stirring, rather than using that called a 'spathe', for thus they name the instrument with which they stir medications being prepared, and we, to have clarity, call it the same. Having thoroughly cleaned the fat part of the branch all around, and having rubbed away the projections on every side and scraped off the bark all around, cut it into fine pieces, so that the cuttings thrown into the medication will have their juice distributed evenly through it." Galen continues much as Aëtius, ending with (379, 11-12) ἀποτέμνων αὐτὸ καὶ ἀπορρίπτων τῷ λοιπῷ χρῷ.

2. [4-5]κιν.: possibly [φοινι]κίνῃ.

συνεχὲς δὲ κτλ.: cf. Gal. 378-9, above, τὸ δὲ συνεχὲς ... περικαθήρας.

2-3. π[ρο]|περι]ξύσας fits the traces of letters much better than κ[αὶ] | λεπ]είσας. Cf. Aët. p. 44, above, καὶ λεπίσας τὸν φλοιόν.

4-6. εἰς λ[ε]πτὰ κτλ.: Aëtius (id.) has εἰς λεπτὰ κατατεμ(ν)ὼν ἔμβαλλε τῷ φαρμάκῳ. At this point Galen has (see above) τὰς λεπτὰς ... κατάτεμνε. At an earlier point in the directions (378, 14) he has καὶ πάντα κατὰ θυείαν ἑνώσας ἔμβαλλε ἐν τῇ κακκάβῃ, κινῶν ξύλῳ φοίνικος, "and having united all together in a mortar, throw it into an earthen pot, stirring with a stick of date-palm." The version of Aëtius (p. 44, 17) has καὶ ἑνώσας ἀκριβῶς ἔμβαλλε εἰς τὴν κακάβην καὶ ἕψε κινῶν σπάθῃ φοινικίνῃ, "and having mixed thoroughly add to the earthen pot and boil, stirring with a spathe of date-palm."

6. [κακάβ]ην: a three-legged earthen pot. The word is spelled with one kappa, or two.

6-9. If the supplement in line 9 is correct the intervening text must have been much abbreviated, as compared with that of Aëtius and Galen. See Aët. p. 44, 22 ἐμβεβλήσθω κτλ. to 45,6 τῷ καταλοίπῳ μέρει χρῷ,[147] cited in the note to lines 1ff., above. We have reached the point of stirring the medication with a now shortened spathe of date-palm and are nearing the end of the instructions of Galen and Aëtius. After a suitable period of boiling, when the medication has become non-staining, it is taken from the fire and all of the cuttings (τὰ τμήματα) which were added are removed. The mixture is to be

cooled while still stirring. It is then placed in a mortar (θυεία) and made pliable with the hands, being formed into cakes (μαζία) which are ready for use as plasters. The affections which are served by the phoinikē-plaster are numerous: bleeding wounds, hard-to-cicatrize and fistulous ulcers, all inflamed ulcers, gout, glandular tumours, fiery inflammations, chilblains, bruisings, and all discharging conditions.

12. The three letters added above the line are in the second hand.

τὰ[c] ἀρτηρίας, windpipe, or arteries, are not included by Galen or Aëtius among the uses of our plaster. Also possible but unlikely is τ' ἀ[κ]εστήρια, medicinal, healing, an apparently uncommon word (cf. LSJ, s.v.).

13.].[.] τὰ τμήμα|[τα would fit the traces.

---

147) Galen has τῷ λοιπῷ χρῶ.

P.Mich. Inv. 21 G 5 x 7 cm.
Plate 7a

- - - - - - - - - - - - - - -

ἡ διὰ [8-10 πρὸς τὰ κα-]
κοή[θη
ου (δρ.) α [
4 οἴνου [

(Hd.2) ξηρ( ) κροκῶδες [
κόλλης (δρ.) γ [
χωρίσει.[
8 κης (δρ.) ς κα[

- - - - - - - - - - - - - - - - - -

5. Pap. ξηρ

1-4. These lines originally contained a complete recipe, as shown by the double-curved lines above 1 and below 4 in the first hand, that of the scribe.[148] They were the last lines of a page of the codex.

1. ἡ: sc. ἔμπλαστρος. There would not have been space for the word in the line if our supplement for the letters of line 2 is correct.

1-2. κα]κοή[θη: malignant ulcers. Cf. 21 B for the Ἀζανίτης recipe πρὸς τὰ κακοήθη πάντα (Gal. XIII 785; Aët. XV, p. 123).

An illustrative recipe for lines 1-4, which meets the conditions of an ingredient ending in a vowel plus ου (line 3) and which contains οἶνος (line 4) is the following:

ἡ διὰ [χαλκίτεως πρὸς τὰ κα-]
κοή[θη χαλκίτεως (δρ.) α ψιμυθί-]
ου (δρ.) α [ἁλὸς (δρ.) β λιθαργύρου (δρ.) δ]
οἴνου [καὶ ἐλαίου τὸ ἀρκοῦν]

"The plaster with copper for malignant ulcers: 1 drachm of copper, 1 dr. of white lead, 2 dr. of salt, 4 dr. of litharge, a sufficient amount of wine and oil." It is taken from Gal. XIII 730, 14, where one of a succession of recipes quoted by Galen from the works of Archigenes on medications for various kinds of ulcers and similar affections, has the following: ἡ χαλκίτιδος, ψιμυθίου ἴσον, ἁλὸς κοινοῦ τὸ διπλοῦν, λιθαργύρου τὸ διπλοῦν τοῦ ἁλὸς, οἴνῳ καὶ ἐλαίῳ ἐναλλὰξ λεαίνων ὡς λιπαρῷ χρῶ.

148) For similar double-curved lines to separate recipes, see P.Ant. III 134

For another recipe in our codex, ἡ φοινικίνη, described by Galen as τὴν διὰ χαλκίτεως ἔμπλαστρον, see F, 10, note. Cf. also C verso, 1-2, and H verso, 6, for plasters called διὰ [δο]δίνου and διὰ πο]μφόλυγος, "with rose oil" and "with zinc oxide."

5-8. These lines are in a second hand, presumably that of the physician-owner of the codex (cf. Introduction). He extruded his lines into the margin, which had been carefully preserved by the scribe, and wrote in a cursive hand, using smaller letters and frequent abbreviations so that he must have reached a total of ca. 45 letters per line. The four lines contained two recipes of two lines each as shown by the paragraphos beneath line 6.

5. ξηρ( ) κροκῶδες: a dry or drying plaster or a powder with saffron. Possible is ξηρ(ὸν) or ξηρ(αντικὸν), sc. φάρμακον. Also possible is ξηρ(ίον), a dessicative powder especially used for wounds and ulcers.[149] Among the treatments of Galen for eye affections is one called τὸ Πακκιανὸν δι' οἴνου κροκῶδες, recommended for ὑπαρῶν ἑλκῶν (filthy ulcers): ἔχει δὲ τοῦτο πλεῖστον μὲν τὸν κρόκον, ἀφ' οὗ καὶ κροκῶδες ὀνομάζεται, "it has the greatest amount of saffron, for which reason it is named 'the saffron kollyrion'" (Gal. XII 715). Also of interest, although we do not expect to find remedies for eye diseases in our codex,[150] is the ξηροκολλούριον τὸ διὰ κρόκου πρὸς ἀρχομένας ὀφθαλμίας, "the drying salve with saffron for incipient ophthalmia" (Alex. Trall. II 17). It calls for juice of the horned poppy, sarcocolla, saffron, and bitter aloes.

6. κόλλης: the word is not likely to refer to κόλλα, a flour-paste used for gluing books (Dsc. II 85.3; Gal. XII 33). Dioscorides, however, cites one medical use (p.170,3): κόλλα δὲ ἡ γινομένη ἐκ τῆς σεμιδάλεως καὶ γύρεως πρὸς τὴν τῶν βιβλίων κόλλησιν ἁρμόζει ἐπὶ αἱμοπτυικῶν, ὑγροτέρα καὶ χλιαρὰ καταρροφουμένη κοχλιαρίου πλῆθος. "Flour-paste, that being made from the finest wheat flour and finest meal for the gluing of books, is suitable for those spitting blood, when it is diluted with additional water and is lukewarm, and a teaspoonful is swallowed by the patient."[151]

More likely is σαρκοκόλλης, ταυροκόλλης, or χρυσοκόλλης. σαρκοκόλλα is briefly described in Paul. VII 3: σαρκοκόλλα δάκρυόν ἐστι δένδρου Περσικοῦ ἐμπλαστικόν τε καὶ ἀδήκτως ξηραῖνον καὶ διὰ τοῦτο καὶ τραύματα κολλᾷ.

---

149) For references to these words on papyrus, see Marganne, p.365; MPER N.S. XIII 7, 1; and 12, passim.

150) The order of medications usually followed by the ancient medical writers begins with the top of the head and works down. Hair problems, scalp troubles, eye diseases, and ear disorders are thus treated before remedies are given for wounds, ulcerations, abnormal swellings, etc. on the surface of the body.

151) I did not find κόλλα τεκτονική, carpenter's glue, with the word-order reversed. See Gal. XII 829, 3 where it is mixed with several other ingredients and made into troches, which are diluted with vinegar for use in removing callouses from abscesses or fistulous sores. For removing lichens with κόλλα τεκτονική cf. 832, 5.

"Sarcocolla is the gum of a Persian tree which is emplastic and dessicative without pungency, and therefore it agglutinates wounds." Cf. also Dsc. III 85; Gal. XII 118.

ταυροκόλλα, gum made from bulls' hides, is used especially for removing lichens, a skin disease characterized by wide, flat eruptions of the skin. For plasters for lichens in our codex, see C, 10 and L, 6. For recipes including taurocolla among their ingredients, cf. Dsc. Eup. I 121 (p. 197, 27); Gal. XII 832-3; 835,2; 837,9; Aët. VIII 16 (p. 423,11; 424,25). None of the recipes call also for saffron.

χρυσοκόλλα, malachite, or copper carbonate, is described in Dsc. V 89; Gal. XII 242; Paul. VII 3. According to Dioscorides: δύναμιν δὲ ἔχει ἡ χρυσοκόλλα σμηκτικὴν οὐλῶν κατασταλτικὴν σαρκωμάτων. "Chrysocolla has the property of rubbing off scars and checking fleshy excrescences." Among the cicatrizing ξηρά of Andromachus (Gal. XIII 728) is the following (729,10): ἄλλο ξηρὸν πρὸς τὰ ὑπερσαρκοῦντα ἐπουλοῦν ἄδηκτον, ὡς Ἁρποκρᾶς. σανδαράχης, χρυσοκόλλης, ἀρσενικοῦ ἴσον ἑκάστου. καὶ πρὸς κακοήθη ποιεῖ τοῦτο τὸ φάρμακον. "Another non-pungent powder for cicatrizing excessive fleshy excrescences, that according to Harpocras: red sulphide of arsenic, malachite, and yellow orpiment - equal amounts of each. This medication is also good for malignant ulcers." For other recipes which include malachite among their ingredients, see Gal. XIII 489,14; 688,12; 695,2; Aët. VIII 16 (p. 425,24). All of these are plasters for ulcers but none of them call for saffron.

7-8. These lines contained a second recipe which may not have been complete. Lines 5-8 take up only 2 cm. in depth, whereas the second hand often wrote 7-8 lines in the lower margins and required only 3-3.2 cm. (cf. 21 H and M and Introduction).

7. χωρὶσσι.[: perhaps χωρ(ὶς) ἰσσίπ(ου) = οἰσύπου, or less likely ὀσσώπου; cf. B, 9 and note ad loc. This interpretation would infer that οἴσυπος had been an ingredient of the preceding recipe (lines 5-6), but the present similar recipe omitted it.

If the diaeresis was inadvertent the text may have had χωρὶς σιδ[ήρου or σιδ[ηρίτιδος, "without iron," or "without ironwort" (cf. LSJ s.v. σιδηρῖτις, II and Dsc. 4.33-5). The herb is especially recommended for agglutinizing wounds.

Inv. 21 G verso 5 x 7 cm.
Plate 7b

- - - - - - - - - - - - - -
]υ
].κα
].αιο
4]την
] ὁπότε
]υνεσ

(Hd.2)]..[..]ου κο( ) ϑ.
8] (δρ.) ιβ
].[...]ης
- - - - - - - - - -

7. Pap. ϑ ʔ

1-6. These are the ends of the last six lines of a page from the body of the codex.

7-9. These are the ends of three lines added in the lower margin by the second hand. They are much damaged by fraying of the papyrus.

7. κο( ) ϑ.: If the reading is correct it must be for κο(τύλαι) ϑ, plus a fraction, which looks on the papyrus like a reversed three-obol sign, ʔ. The preceding ingredient was then a liquid.

P.Mich. Inv. 21 H 9 x 8 cm.
Plate 8a

- - - - - - - - - - - - - -
.[.]..[
ἑνώσα[ς] θυεί[ᾳ
αὐτὴν [..].δοτε[
4 ἡ ἔμπλαστρος ῥοδ[ίνη ±3]
καθάρας τὰ πέταλ[α ὑσσώ-]
που κλάδου τοῦ δ[
(Hd.2) [ἔ]μπλαστος ἀφοδευ[ο]μένῳ σασσ[ομένῳ ± 15]
8 μοι τῷ πόνῳ .....[
δέδοκ(α) κηροῦ (οὐγ.) α .[
μίσυος εσβ( ) (δρ.) α α.[
χαλβάν(ης) (οὐγ.) β μυ[
12 χαλβάνην καὶ [
[[...ασασαρ]] θυ[
διηθήσας χρῶ [

9. δέδωκα, Pap. δεδοκ 10. Pap. εσβ 11. Pap. χαλβαν

1-6. These lines were the last lines of a page of the codex.

2. ἑνώσα[ς] θυεί[ᾳ, "having united in a mortar." For the verb in our codex, see C, 4. Also possible is συν]|ενώσα[ς] and εὐερ[γῶς "having mixed well together." For the compound verb, see A verso, 3; C, 5; E verso, 12.

3. [..].δοτε[: δότε or ἀνάδοτε is not likely since the recipe must have been for a plaster or salve, not a liquid, as shown by line 4 which has the title of a new plaster.

4. ἡ ἔμπλαστρος ῥοδ[ίνη: The scribe did not indent this line or leave a space before it, but he did separate the new recipe from the preceding with a paragraphos connected to two marks of parenthesis in the margin. For another

plaster with rose oil in our codex, see C verso, 2.

5-6. καθάρας ... κλάδου: "having washed the leaves of a branch of hyssop." Gal. XII 826 has four medications in succession for hardened skin erruptions on the face, πρὸς τετυλωμένους ἰόνθους. The second calls for equal parts of red sodium carbonate, hyssop, pennyroyal and quarried salts, pounded, put through a fine sieve, and added to a cerate with rose oil. The fourth recipe calls for equal parts of baked salts, pennyroyal, hyssop, ammoniac incense and tanning sumach, which are taken into a cerate with rose oil and thereafter applied to the skin erruptions.

In place of καθάρας the text may have had ἀνα]|καθάρας or δια]|καθάρας since line 4 has only 17 letters.

6. τοῦ δ[: δένδρος would not normally be used of ὄσσωπος.

7-14. These lines are in the second hand and probably contain at least two recipes in view of the two symbols in the margin opposite lines 8-9 and line 10. The same two signs are in the margin opposite lines 7-9 of M, again by the second hand with reference to his own recipes added at the foot of the page.

7. The second hand extruded this line 1 cm. into the margin, beneath a wavy line he had drawn to separate his text from that above.

[ἐ]μ̣π̣λαστος: π̣ appears to have been corrected from a premature λ. ἔμπλαστος, according to Galen (XIII 372), was an earlier form of ἔμπλαστρος.

ἀφοδευ[ο]μένῳ σασ̣[ομένῳ: The supplement is illustrative. The plaster or salve may be for a person suffering from impacted bowels (ἀφοδεύω, to discharge feces; σάσσω, to press close, compress).

8. μοι: the physician-owner is giving his own experience with the recipe in lines 7-9, and has drawn special attention to it with a sign in the margin, ⲥ, which he repeats twice in the margin of M, 5-6 and 7-8. The text may have had ἐ]|μοι; cf. Gal. XIII 375, 10 and note to line 9, below.

τῷ πόνῳ: "for the pain." After πόνῳ there is not enough ink to hazard any letters.

9. δέδοκ(α) = δέδωκα: "I have given" for the preceding ailment the following recipe: "one ounce of wax, ..." Cf. Galen's introduction to his φοινικίνη recipe with copper, quoted in the note to 21 F, 10.

10. This line is the beginning of a second recipe and has in the margin the familiar symbol for χρηστός, "good, useful, effective." Here it has the form ☩; it is more often found ⲣ̄ⲭ̄. For the symbol see K.McNamee, Abbreviations in Greek Literary Papyri and Ostraca, BASP Suppl. 3, p.109.

Following the symbol, the first letter in line 10 appears to be another symbol, ☨, perhaps indicating the start of a new recipe. Cf. the sign used in the Kühn text of Galen to introduce the ingredients of each new recipe, e.g. XII 826, the page mentioned in the note to lines 5-6, above, which has

four consecutive recipes for facial skin erruptions, lines 6, 10, 12 and 16. The symbol is made ϟ. Perhaps our sign and that used by Kühn are both stylized representations of lambda with an abbreviation-mark = λ(άμβανε) or λ(άβε) = Lat. R(ecipe), "take".

μίcυος εcβ( ) (δρ.) α: Any reading of the letters after mu is difficult. If ιc is correct it was made as a monogram. After μίcυος one would expect ὠμοῦ or ὀπτοῦ, "crude or baked copper", or possibly a place-name such as Κυπρίου (cf. D, 5 and footnote 83). ἔcβ( ) brings to mind cβέννυμι, to quench; the word is found with respect to the metal litharge in Dsc. 5.87.3, where the method of burning is given. ἔνιοι δὲ ὄξει ἢ οἴνῳ cβεννύντες αὐτὴν ἐπὶ τρὶς πάλιν καίουcι, "some, quenching it with vinegar or wine, burn it again, three times." If the three letters in our text are resolved as the verb ἔcβ(εcα), "I quenched the one drachm of copper," we would need to supply many more missing words than usual.

11. χαλβάν(ηc), the resinous juice of all-heal: The writer made a start on the first vertical of eta, but abandoned it in favor of an abbreviating-oblique stroke below nu.

μυ[: The most common recipe-ingredients which begin with the letters μυ are perhaps μυρίκη, tamarisk (Dsc. I 87, Gal. XII 80) and μυρcίνη, myrtle (Dsc. I 112, Gal. XII 81). For the latter see B verso, 11, [μυρcί]νου ἐλαίου.

13. The cancellation was effected with nine dots above the letters and two horizontal lines through them.

θυ[: possibly θυ[είᾳ, "in a mortar".

14. διηθήcαc χρῶ [, "strain and use". The recipe may have ended at that point.

P.Mich. Inv. 21 H verso — 9 x 8 cm. — Plate 8b

- - - - - - - - - - - - - - - - - - -

]καὶ π[ρ]ὸc τοὺc
[κόλπους προcφά]του[c] καὶ τῶ(ν)
[ἑλκῶν cυνουλο]υμένων καὶ — ξ(ηρόν)
4 [πρὸc τὰ δυc]επούλωτα ἕλκη — πληρ(οῖ)
[καὶ πρὸc δ]ὲ τὰc χιμέτλαc κὲ

(Hd.2) [ἔμπλαcτροc ἢ διὰ πο]μφόλυγοc πομφόλυγοc (οὐγ.) β
[λιθαργύρου (οὐγ.) γ cτέατοc ὀρ]νιθεί[ου] (οὐγ.) β κηροῦ (οὐγ.) δ
8 [χυλοῦ λινοcπέρμου (οὐγ.). χαμαιμήλου] (οὐγ.) ε τὰ τηκτὰ
[κατὰ τῶν λείων τῆc λιθαργύρου κ]αὶ τοῦ πομφόλυγοc

2. Pap. τῶ 3, marg. Pap. ξ| 4, marg. Pap. πληρ 5. χιμέτλαc: τ corr. fr. θ, καί

Translation

... It is good for new fistulous ulcers, for ulcers needing to be completely cicatrized, and for those that are hard to cicatrize; it is also good for chilblains and ... .

(Hd.2) The plaster with zinc oxide: 2 ounces of zinc oxide, 3 oz. of litharge, 2 oz. of poultry-fat, 4 oz. of wax, juice of linseed, 5 oz. of chamomile. Add the melted solubles to the triturated litharge and zinc oxide.

1-5. The last five lines of this page of the codex had the uses of a foregoing recipe, which were continued at the top of the following page. They are reminiscent of those given for the φοινικίνη-plaster of Galen (XIII 380; Aët. XV, p. 45; F, 10ff.).

2. [κόλπους προσφά]του[c]: recent fistulous ulcers. The supplement is illustrative. For these ulcers which spread under the skin, see A verso, 12, n.; B, 6; B verso, 4. For the φοινικίνη recipe as a remedy for κόλποι, δυσεπούλωτα ἕλκη and χίμετλα, among other affections, see Aët. XV, p. 45. A μηλίνη-recipe of Heras is good πρὸς τοὺς παλαιοὺς κόλπους (Gal. XIII 511, 6). The Isis plaster of Epigones forms callouses on κόλπους and σύριγγας πάσας προσφάτους, "all recent abscesses."

After καί sc. ἐπί.

3. [ἑλκῶν συνουλο]υμένων: Possible also is [ἑλκῶν ἐπουλο]υμένων. For the verbs in connection with ulcers, see the notes to B verso, 7 and F, 10. Gal. XIII 412, 17 has συνουλουμένων ἑλκῶν, but on 522, 1-3, the verbal adjectival forms are regarded as interchangeable: εἴτ' ἐπουλωτικὰς εἴτε συνουλωτικὰς ἐθέλεις ὀνομάζειν τὰς οὐλὴν ποιούσας ἐμπλάστρους.

3-4, marg. To the right of these lines are two additions in the second hand. Opposite line 3 is a single letter followed by a vertical stroke, ξ| = ξ(ηρόν) or ξ(ηρίον), for which see the note to G, 5. Recipes for plasters could be made into powders or dry applications by the omission of liquids.

Opposite line 4 is πληρ( ) = πληροῖ. See the note to D, 3-4, on the filling of ulcers.

4. τὰ δυς]επούλωτα ἕλκη, hard-to-cicatrize ulcers. See B verso, 2 with note to lines 1-4.

5. τὰς χιμέτλας, chilblains. See F, 8-9, note.

κέ = καί: See note to F, 7.

6-9. The second hand added in the lower margin the recipe for the plaster ἡ διὰ πομφόλυγος, "with zinc oxide". Beneath the four lines of the text is a blank space of one line, followed by three more lines of text, so badly rubbed by some abrasive material that only tiny dots of ink remain here and there. These lines could in fact have been deliberately erased.

The plaster with pompholyx is found in several of the ancient medical writers. The recipes vary in the number of minerals called for - from two to five - and in the number and content of the remaining ingredients. All have litharge, in addition to pompholyx, and all have wax. The total number

of ingredients varies from 6 in Paulus' τὸ πομφολυγηρόν (VII 17.31) to 14 in the plaster of Aëtius, ἡ διὰ πομφόλυγος Ἡρᾶ Καππάδοκος (XV, p. 136). Three other plasters have 8 ingredients each: Aët. XV, p. 131, 1, φάρμακον τὸ διὰ πομφόλυγος; p. 131,10, ἄλλο ὡς Ἀρχιγένους καὶ Ὀρειβάσιος; Orib.Eupor. IV 130 (V 788), τὸ διὰ πομφόλυγος. The two recipes of Oribasius have the same ingredients but varying amounts, and one difference in the ingredient ὠῶν, eggs. The recipe given by Aëtius calls for nine baked egg yolks, while that in Orib.Eupor. calls for "eggs without yolks" (the number unspecified, or accidentally omitted).

The text given above of H verso, 6-9, is modeled on that of Paulus and is for illustrative purposes only.

6. πομφόλυγος (οὐγ.) β: so Paul. also.

7. στέατος ὀρ]νιθεί[ου] (οὐγ.) β: Paul. has στεάτων χηνείων ἢ ὀρνιθείων (οὐγ.) β, with two MSS having sing. forms.

κηροῦ (οὐγ.) δ: Paul. has κ. (οὐγ.) ς.

8. χαμαιμήλου] (οὐγ.) ε: Paul. has χ. (οὐγ.) ς.

8-9. τὰ τηκτὰ κτλ.: The text of Paulus is the following: πομφόλυγος (οὐγ.) β, λιθαργύρου (οὐγ.) γ· λειοῦνται μετὰ χυλοῦ λινοσπέρμου καὶ ἐπιβάλλεται τακέντα καὶ ψυγέντα κηροῦ (οὐγ.) ς, στεάτων χηνείων ἢ ὀρνιθείων (οὐγ.) β, χαμαιμήλου (οὐγ.) ς. "The 2 oz. of pompholyx and 3 oz. of litharge are finely pounded with the juice of linseed; when melted and cooled (the remaining ingredients) are added, 6 oz. of wax, 2 oz. of goose or poultry fat, 6 oz. of chamomile." The directions of Aëtius for the recipe on p. 131,1 are κόψας καὶ σήσας τὰ μεταλλικά, λείου σὺν οἴνῳ καὶ ἐπίχεε αὐτοῖς τὰ τηκτὰ καὶ χρῶ. "Pound and put through a seive the minerals and triturate them with wine. Pour the melted solubles over them, and use." Cf. the brief direction τὰ τηκτὰ κατὰ τῶν ξηρῶν in A, 11 and B verso, 12. Several words may have been lost at the end of our text in the first half of the "blank space of one line". See the note to lines 6-9, above.

On the uses of the plaster with pompholyx, Aëtius has (p. 136) μάλιστα δὲ ποιεῖ ἐπὶ τῶν κακοήθων ἑλκῶν καὶ καρκινωδῶν διαθέσεων, καὶ τὰ παλαιὰ ἕλκη καὶ δυσεπούλωτα καὶ τὰ πυρίκαυστα. "It is especially effective for malignant ulcers and cancerous conditions, for chronic and hard-to-cicatrize ulcers, and those caused by burns." Cf. Paul. IV 4.2 εἰ δὲ ἑλκωθείη τὰ μέρη, χρῆσθαι παρύγρῳ <ἢ> τῷ διὰ πομφόλυγος καλουμένῳ, "if the parts are ulcerated, use the parygron or the plaster called that with pompholyx." Cf. note to A, 5ff.

P.Mich. Inv. 21 I 5 x 6 cm.
Plate 9a

- - - - - - - - - -
]ης
πρὸς κ]ατάρον
ἡ δ]όσις

(Hd.2) 4] ἡπατικοῖς
]κοις ομοι( )
]κοις καὶ
].
8]κος
].μου
]ιου

2. κατάρρουν

1ff. This page of the codex, I recto, did not contain recipes for plasters as did all of the preceding texts. Together with I verso, J recto, J verso, and L verso, it contains recipes for καταπότια (pills) or τροχίσκοι (troches) to be taken with liquids as anodynes or antidotes for various physiological ills. 21 I and J were surely consecutive, though not necessarily in that order, since a small piece of the tying-cord is still caught in a bottom hole of 21 I, having become detached from the much longer piece still in place in 21 J. 21 L verso also belongs to these texts as it contains similar recipes, but it was the turning point in the codex for the beginning of recipes for plasters, since plasters are found in both the main text of 21 L recto and by the second hand in the lower margin. The most likely original order, therefore, of the fragments of Inv. 21 is the following: I, J, L verso, L recto, G, H, K, M, followed by A-F. See the order of recipes, with respect to plasters and pills, in Galen's books on the Composition of Drugs. The latter are found for the most part in XIII 1-361, with recipes for plasters following.

2. κ]ατάρον = κατάρροον, κατάρρουν, catarrh, the inflammation of any mucous membrane, especially of the air passages of the head and throat (LSJ). Galen has a recipe called the anodyne of Antonius Mousas (XIII 57,3) πρὸς κατάρρουν ποιοῦσα καὶ πρὸς τὴν τῆς φωνῆς ἀποκοπήν, "which is effective for catarrh and loss of voice." The ingredients are opium, myrrh and seed of henbane; the final direction is ἀνάπλαττε καταπότια ὀρόβου τὸ μέγεθος καὶ δίδου δύο εἰς ὕπνον ἀπερχομένοις. "Form into small pills the size of vetch-seed and give two on retiring at bedtime."

3. ἡ δ]όσις, a dose of medicine: Also possible is ἡ τελεία δ]όσις, an adult dose; cf. J, 6. The sentence was continued at the top of the next page. An anodyne of Proxenus from the works of Antonius Mousas (XIII 61, 11) is good for chronic coughs and recurrent discharging conditions, and also for allaying fevers. After the ingredients is the direction: ἡ δόσις καρύου Ποντικοῦ τὸ μέγεθος μεθ' ὑδρομέλιτος κυ(άθων) γ. "The dose is a pill the size of a Pontic nut with three kyathoi of hydromel." For 3 kyathoi = ca. one-half cup, see LSJ, s.v. κύαθος. Another anodyne (59, 10) which is "good for coughing and is an altogether excellent expectorant", concludes with ἀναλάμβανε μέλιτι ἀπέφθῳ, ἡ δόσις κοχλιαρίου καλοῦ, "take with boiled honey, the dose is one good spoonful. The measure κοχλιάριον is found in our codex in L verso, 9.

4-10. See note to lines 1ff., above. In view of the 40-45 letters per line, postulated for the second hand (see Introduction), there must have been a number of different conditions specified in lines 4-6, for which this recipe was useful.

4. ἡπατικοῖς: for those suffering from liver complaints. A medication of Andromachus from a recipe of Eugenius (XIII 114, 13) has the following: πρὸς ὀρθοπνοϊκοὺς, βηχικοὺς, περιπνευμονικοὺς, φθισικευομένους, δυσπνοοῦντας, ἡπατικούς, "for those suffering from orthopnoea, coughing, inflammation of the lungs, consumption, shortness of breath, and liver complaints." The direction for use is δίδου κοχλιάριον ἓν μεθ' ὕδατος κυάθων δυοῖν ἢ τριῶν, "give one spoonful with two or three kyathoi of water." An antidote for an upset stomach (158, 14) is also good for τοῖς καυσουμένοις καὶ πρὸς πᾶσαν ἐμπνευμάτωσιν καὶ βραδυπεψίαν, ... ὑδρωπικοῖς, νεφριτικοῖς, ἡπατικοῖς, "for those suffering from heartburn, every type of flatulence, slow digestion, dropsy, kidney and liver complaints." A recipe for a diuretic (213, 6) begins ποιεῖ πρὸς τὰς σκιρρώδεις τοῦ ἥπατος διαθέσεις καὶ σπληνικοῖς καὶ τοῖς δυσαναλήπτοις καὶ ὑδρωπικοῖς καὶ καθόλου εὔχροιαν ἐμποιεῖ. "It is good for calloused conditions of the liver, for those suffering from splenetic affections, from a difficult convalescence back to normal habits, and from dropsy; and, in general, it produces a healthy complexion."

5. ομοι( ): perhaps ὁμοί(αις) | διαθέσεσι, "similar conditions."

P.Mich. Inv. 21 I verso 5 x 6 cm.
Plate 9b

```
                    - - - - - - -
                    δ[
                    κατα[
                    τεθε[

(Hd.2)  4           πυρέθρ[ου
                    κακοὺς .[

                    ἁλκαί[ας
                    δελη.[
                8   ...[
```

1-3. These are the last three lines of a page of the codex. For the probable content see note to 21 I, 1ff.

4-5. These lines, in the second hand, held a complete recipe as shown by the paragraphos beneath line 5. And the ingredients must have been few, not more than three or four, since they were limited to line 4.

4. πυρέθρ[ου, pellitory: On this herb see Dsc. III 73; Gal. XII 110. An anodyne with only three ingredients is found in Gal. XIII 56. It has the following: ἄλλη πρὸς κατάρρους καὶ πάσας τὰς βηχώδεις διαθέσεις. Ἀσκληπιάδης ἐν τῷ πρώτῳ τῶν ἐντὸς οὕτως ἔγραψεν πρὸς κατάρρους, ᾧ ἐχρήσατο Κόμων ὁ φιλόσοφος ὡφελεῖ παραχρῆμα. πυρέθρου, κόστου ἀνὰ (δρ.) β, πεπέρεως λευκοῦ (δρ.) α.

κόψας καὶ σήσας ἀπόθου. ἐν δὲ τῇ χρήσει κέλευε παράπτεσθαι τῶν μυξητήρων καὶ τὸ φάρμακον ἀνασπᾷν. "Another anodyne for catarrhs and all conditions accompanied by coughing. Asclepiades in the first book of his work on internal disorders wrote about catarrhs that Komon, the philosopher, had used this recipe and was helped immediately. 2 drachms each of pellitory and costus, and 1 drachm of white pepper. Pound them fine, put through a sieve, and store. For use, urge that the medication be applied to the nostrils and inhaled."

An antidote for poisonous bites, made of most common and powerful ingredients (Alex.Trall. I 557, 8), has the following: ἡ τοῦ πυρέθρου ῥίζα κοπτομένη καὶ ἀναλαμβανομένη μέλιτι, κοχλιάριον ἕν, ἐκ διαστήματος ἄχρις ἕνδεκα δόσεων. πεπείραται τὸ βοήθημα, καὶ μὴ τῆς εὐτελείας αὐτοῦ καταφρονήσῃς. "The root of pellitory, pounded fine and taken into honey. One spoonful, at intervals, up to eleven doses. This remedy is proved, and you should not despise it because of its cheapness." Cf. 21 A, 7-8.

5. κακοὺς .[: perhaps πρὸς] | κακοὺς κ[ατάρρους. Cf. the preceding note and I recto, 2, note.

6-8. These lines held another recipe by the second hand.

6. ἀλκαί[ας: For ἀλκαία, vervain mallow, Malva moschata, see Dsc. III 147, where the brief description concludes with ῥίζας λευκὰς πλαγίας (πλατείας app.crit.) πέντε ἢ ἓξ ὅσον πήχεως, αἵτινες ἐν οἴνῳ ἢ ὕδατι πινόμεναι δυσεντερίαν καὶ ῥήγματα ἰῶνται, "five or six broad white roots, as much as a cubit long, which, being drunk with wine or water, will cure dysentery and ruptures." ἀλκαία is not found among the "simples" of Galen or Aëtius, but Paulus (VII 3) has ἀλκέα (ἀλκαία) εἶδός ἐστι καὶ αὐτὴ τῆς ἀγρίας μαλάχης, σὺν οἴνῳ πινομένη δυσεντερίας καὶ δήξεις ἰᾶται, καὶ μᾶλλον ἡ ῥίζα αὐτῆς. "Alcaea is a kind of wild mallow. Being drunk with wine, it cures dysenteries and internal gnawings, more particularly its root." One manuscript of Paulus, F, has ἀλθαία (in place of ἀλκέα) which is another kind of wild mallow, called marsh mallow. It is found among the "simples" of all the medical writers and is frequently listed among the ingredients for recipes of various kinds. Cf. especially Dsc. III 146 where its many uses are cited, including those which are given for ἀλκαία. It thus appears likely that because of its many more uses ἀλθαία was preferred to ἀλκαία by the medical practitioners.

ἄλκαρ, remedy, is a possible but less likely reading of line 6. Cf. the single reference from Aretaeus in LSJ, s.v.

P.Mich. Inv. 21 J 7 x 6.5 cm.
Plate 10a

- - - - - - - -
]c
]τρι
]ανου

(Hd.2) 4] ἐνπνευμα-
]πεψίαν εν
] (οὐγ.) γ ἡ τελε(ία)
] τὰ ποτήμα(τα)
8]. εὕυπ(να)
]c κα-
]

A 9-10 cm. length of the tying-cord is still in place, caught in three sets of two holes each opposite lines 4-9. See plate and Introduction to Inv. 21, with footnote 2.

1-3. These are the last three lines of a page of the codex. For the probable content see note to 21 I, 1ff. In the margin, about 1 cm. to the right of lines 2-3 and midway between them, is a small colon in the second hand. A colon is sometimes used to mark the end of a section, often in the middle of a line. Cf. E.G.Turner, Greek Manuscripts of the Ancient World, 10. But the colon in our text is so small it could have been inadvertent.

4ff. These lines were written by the second hand with a blank space of 1 cm. left above line 4.

4-5. ἐνπνευμα[...]πεψίαν: Possibly πρὸς ...] ἐνπνευμά[τωςιν ... καὶ βραδυ]πεψίαν. Cf. Gal. XIII 158, 14, for the sacred antidote of Themison πρὸς πᾶαν ἐμπνευμάτωςιν καὶ βραδυπεψίαν, κτλ., "for every kind of flatulence and slow digestion, etc." For δυς]πεψίαν, cf. 165, 2: ἀςτὴρ ἀνίκητος φάρμακον ἐπιτετευγμένον ἀνώδυνον, ὑπνοποιὸν, πολύχρηςτον. καὶ γὰρ τὰ περὶ τὸν ςτόμαχον ἰᾶται νοςήματα θαυμαςτῶς, ὀξυρεγμίας καὶ δυςπεψίας ἀπαλλάττει ςτρόφους, λυγμοὺς, ἐμπνευματώςεις. "A stellar unbeatable medication, a successfull all-purpose anodyne, which produces sleep. For it heals wonderfully the ills of the stomach, and stops heartburn, indigestion, colic, retchings, and flatulence." Less likely in our text is ἀ]πεψίαν, "indigestion", but cf. Gal. VII 66 for problems of digestion, including ἀπεψ-, δυςπεψ-, βραδυπεψία.

5. εν: possibly ἐν|[τέρου or ἐν|[τέρων. Cf. Dsc. II 85.2 πρὸς ἐμπνευματώςεις ἐντέρων. Also possible is ἐν|[τός; cf. Gal. XIII 294, 17 πότημα πρὸς τὰ ἐντὸς δεύματα. Less likely is ἐν |[ςτομάχῳ.

6. The ingredients were few since they were limited to ca. 30-35 letters in line 6. The amount of the last ingredient was 3 ounces.

ἡ τελε(ία): sc. δόςις, unless it was the first word of line 7. Cf. 21 I, 3, note.

7. τὰ ποτήμα(τα): If the reading is correct, the "pills" (cf. LSJ, s.v.) would refer to the preceding recipe and the text would continue with further uses, ending with εὕυπ(να), "they also give a sound sleep" (line 8). For πότημα, cf. note to line 5, above, and Gal. XIII 295, 5, πότημα πρὸς πᾶν δεῦμα καὶ ἐμπνευμάτωςιν Λουκίου Ταρςέως, "a pill of Lucius of Tarsus for every

kind of discharge and flatulence." The direction is ὕδατι ἀναλάμβανε καὶ οὕτω χρῶ, "take with water and use in the same way." For πότημα in the papyri see P.Oxy. VIII 1088, 48 π. πρὸς ἡπ[α]τικ[ο]ύς, "for liver-patients"; 63 π. ὑδρωπικῶν, "for dropsy-patients"; 66 ὑπνωτικὸν πότημα, "a sleeping draught".

An alternative reading τὰ κα]ταπότια καὶ, "the little pills", might be interpreted similarly, rather than a start on a new recipe which would be expected to end at the bottom of the page. For these small pills, see, e.g. Gal. XIII 57, 7; 67, 5; 68, 4. 16; 69, 12; et al.

8. εὔυπ(να): "giving good sleep". Cf. LSJ, s.v. An anodyne of Galen is described as follows (59, 17): καταπότιον βηχικὸν πρὸς τὰς προσφάτους διαθέσεις πανάκεια φάρμακον ἀνώδυνον καὶ ὑπνοποιὸν, ποιεῖ αἱμοπτυϊκοῖς, "a pill for coughs, a panacea for recent conditions, an anodyne medication which is sleep-producing and is effective for those suffering from spitting of blood." For another sleep-producing remedy, see 158, 14, in note to lines 4-5, above.

10. There is a space of 1 cm. below line 9, which is ample for another few words to complete the recipe.

Inv. 21 J verso 7 x 6.5 cm.
Plate 10b

```
                    - - - - - - - - - -
                    ...[
                    ιαε.[
                    τικο[
(Hd.2)    4         συνκο[πτικοῖς
                    τους κ[
                    τους δ[
                    οδο..[
                8   θε[
                    - - - - - - - - - -
```

4. συγκοπτικοῖς

1-3. These are the last three lines of a page of the codex. For the probable content see note to 21 I, 1ff.

3. For several ailments ending in -τικοῖς (-τικούς) see notes to 21 I, 4 and line 4, below.

4-8. These lines are in the second hand, which here preserved the same margin as that of the text above. No paragraphos is visible between the two texts, nor was there a space left between them. The five lines occupy only 2.5 cm. of the normal 4 cm. of the lower margin, and since they seem to be filled almost entirely with ailments, at least two or three more lines are needed to complete the recipe.

4. συνκο[πτικοῖς, "for those afflicted with syncope", a sudden loss of strength. Also possible is συνκο[πτομένοις, with the same meaning. For the

adjective see Gal. XV 462, 9 and P.Ant. III 124 (b) ii, 15. In the latter instance it is joined (lines 12ff.) with πλευριτικοῖς, νεφριτικοῖς, ληθαργικοῖς, πυρετοῖς, καυσώδεσιν and διαφορητικοῖς, "those suffering from pleurisy, kidney complaints, lethargic fever, burning fevers and exhausting perspiration." For the verb see Gal. VIII 806; IX 291.

5,6. From dative forms the construction changed, as often, to πρὸς + accusatives. Cf. e.g. Gal. XIII 55,2 πρὸς κατάρρους, βήττουσι, κτλ.; 60, 14ff.; 65-66; 158, 14ff.; and note to J, 7.

P.Mich. Inv. 21 K 6,5 x 7 cm.
Plate 11a

- - - - - - - - - - - - - - - -
λιω[
λαρ[
τος υ[
4 νιας (δρ.) η χα[
[..]...χ.[
(Hd.2) κράσεως και κ.[
μίξας τρῖς τοῦ ς[
8 δικτοις μετὰ [
τῷ φαρμάκῳ .[
μετὰ χυλοῦ γεν[τιανῆς

7. τρεῖς 8.-δήκτοις

1-5. These lines have the remnants of the last five lines of a page of the codex. They are so meager that we cannot be sure of a single word.

1. λιω[is reminiscent of the verb λείοω, to pound fine or triturate, which occurs so frequently in the directions for making plasters and other medications. Cf., e.g., Aët. XV, p. 120, 20 μολύβδαιναν καὶ λεπίδα κόψας καὶ σήσας, τοὺς δὲ ἄλας λειώσας ἀκριβέστατα, ἔπειτα ἅμα λειώσας πάλιν καὶ χνοώδη ποιήσας, ἐπίβαλλε αὐτοῖς τὸ ἔλαιον καὶ λείου θυίᾳ εὖ μάλα. "Pound and sift the lead and the copper flakes and thoroughly pound fine the salts. Then pound again altogether, and make into a fine powder. Add to these the oil and triturate in a mortar to a very soft consistency." But in our text we would have a partial direction before all of the ingredients are given. See line 4, -νιας (δρ.) η.

2. λαρ[is reminiscent of λάριξ, the larch tree, frequently found with ῥητίνη, and often used in place of τερμινθίνη ῥητίνη. Cf. Gal. XIII 451, where Tyrrhenian and Pontic wax are called the very best for use in λευκαὶ ἔμπλαστροι, and the resins ἡ λάριξ ὀνομαζομένη καὶ ἡ τερμινθίνη are cited as the most useful for malignant ulcers. A recipe of Asklepiades for δυσθεραπεύτων ἑλκῶν, ulcers which are difficult to heal, has the following (743, 16): λεπίδος χαλκοῦ, ἰοῦ ξυστοῦ ἀνὰ (οὐγ.) α, κηροῦ ἡμίλιτρον, ῥητίνης λάρικος (οὐγ.) α

ἥμισυ. τὰ τηκτὰ κατὰ τῶν ξηρῶν καὶ ἀνελόμενος χρῶ. "Of copper flakes and scraped iron rust, one oz. each; of wax, one-half lb.; and of larch-resin, one and one-half oz. Add the melted soluble ingredients to the powdered dry ingredients. Mix together and use."

3, marg. See note to line 5, below.

3. τος υ̣[: If υ̣ is correct, στέατος ὑείου, swine-fat, comes to mind. It is found in A, 8; B, 10; and D, 6.

4. νιας: κολοφωνίας, also a resin, is not likely here if λάρ[ικος is correct in line 2.

χα[: χαλκός is a most common ingredient in the medicinal plasters. Cf. note to line 2, above, for λεπίδος χαλκοῦ together with ῥητίνης λάρικος.

5. Below this line is a 1 cm. blank space, which is filled with a long double-curving line in the second hand. Also in the second hand is a large check-mark, ✓, in the margin opposite line 3, and a large right angle, L, enclosing the beginnings of lines 4 and 5.

6-10. These lines are in the second hand and contain directions for mixing and for the use of a recipe. They probably pertain to the recipe immediately above in the body of the text, rather than to a recipe in the lower margin of the preceding page, which would also have been written by the second hand. Cf. note to line 5.

6. κράσεως: "blending or mixing", usually of a diluting agent added to a medicinal preparation to make it ready for a particular use. Cf. Gal. XIII 524, 14: ἡ κρᾶσις ἔστω κατάλληλος τῇ διαθέσει, "the blending should correspond to the condition of the body." The statement follows the list of ingredients and the directions for the mixing of a recipe of Asklepiades for a cicatrizing plaster. Cf. note to line 8, below.

7. μίξας τρῖς τοῦ ς̣[: Possibly "having mixed three ... of ...," or "three times." Cf. 425, 9 καὶ γὰρ ἴσα τὰ τέτταρα μίξας, "mix the four ingredients with equal amounts." Cf. also Orib. IV 601, 8 καθμείας τρῖς κεκαυμένης (οὐγ.) β.

8. δικτοις (-δήκτοις) μετὰ [: For the construction see D verso, 2-9, note. Several possibilities for -δήκτοις are θηριο-, κυνο-, ἀνθρωποδήκτοις, "for those who have suffered bites by wild beasts, dogs, men." For plasters to be applied in such circumstances, cf. Gal. XIII 437, 15; 558, 2; 560, 2; 774, 14; 779; 781; 788; 878, 11 et al. Cf. also note to 21 E, 14-15.

10. μετὰ χυλοῦ γεν̣[τιανῆς: "with juice of gentian." Cf. Dsc. III 3.2, where the root of gentian, and especially its juice, is called a τραυματική and a remedy for spreading ulcers.

P.Mich. Inv. 21 K verso 6.5 x 7 cm.
Plate 11b

]ντα
]τε
]υϊ

(Hd.2) 4]κηρ(οῦ) (οὐγ.) γ
ἀ]ννήσου (οὐγ.) γ
]..ουβ...ου (οὐγ.) ς
λιβ]άνου (οὐγ.) α
8] στέατος ταυρ(είου)(λίτ.) α

5. Pap. κηρ 8. Pap. ταυρ

1-3. These are the last three lines of a page of the codex.

3.]υϊ: Possibly πιτ]υΐ[νης, "pine resin", with or without ῥητίνης. Cf. E, 11. στέατος ὑίου (ὑείου) is not likely, since the diaeresis is always on the upsilon in our codex. See A, 8; B, 10; D, 6.

4-8. These five lines are in the second hand and follow a blank space of one line. If they contain a single recipe it must have had 15-20 ingredients, in view of the long lines produced by the second hand. Of the four ingredients - κηρ(οῦ), ἀ]ννήσου, λιβ]άνου, and στέατος ταυρ(είου) - only ἄννησον is not found in the several plasters of Galen, Aëtius and Paulus which contain the other three ingredients of our text, in addition to 6-17 further ingredients. Cf. Gal. XIII 544, 6, a καταγματική, a "plaster for fractures" of Heras, which has 12 ingredients in all; 549, 16, a καταγματική of Andromachus, which has 14 ingredients; 556, 10, another of Andromachus, called ἀνίκητος, "unbeatable", with 20 ingredients; Aët. XV, p. 69, 15, a similar plaster with 12 ingredients; Paul. VII 17.36 and 86, with 9 and 10 ingredients, respectively.

4. κηρ(οῦ) (οὐγ.) γ: 3 ounces of wax. For κηρός in the medical papyri, see Marganne, p.362. Our codex has κηρός in twelve recipes.

5. ἀ]ννήσου (οὐγ.) γ: 3 ounces of anise. For this ingredient in the medical papyri see Marganne, p.356.

6. None of the recipes referred to in the note to lines 4-8, above, have an ingredient that will fit the remnants of ink in this line.

7. λιβ]άνου (οὐγ.) α: 1 ounce of frankincense. Also possible is πηγ]άνου. Cf. Gal. XIII 336, 11, a plaster of Andromachus for sciatica which has πηγάνου, κηροῦ, and στέατος ταυρείου and 15 additional ingredients.

8. στέατος ταυρ(είου) (λίτρα) α: 1 pound of bull-fat. On the strength of the different kinds of animal fat see Aët. XV, p. 12, 8ff. στέατος ταυρείου is found again in our codex in B, 11.

8, marg. To the right of this line and slightly below is a large, very black dot of ink (3 x 4 mm.), probably used to mark the recipe for some purpose.

P.Mich. Inv. 21 L 5.8 x 6.5 cm.
Plate 12a

- - - - - - - - - - - - - - - -
της χαρ[
ἐνπλάστρι[ον ± 9]
λιθαργύρο[υ ± 10]
4 ἐλαίου κοτ(ύλ.) [± 11]
τρῖβε τὴν [λιθάργυρον καὶ]
(Hd.2) ἔμπλαστρος πρὸς λιχῆ[νας ± 22]
θίου ἀπύρου (δρ.) α τήλε[ως ± 25]
8 μετὰ τῶν ξηρῶν χ.[± 29]
ἀνάλου (οὐγ.) ιβ ταυρ[οκόλλης ± 22]
[..]...[
- - - - - - - - - - - - - - - - - - -

2. ἐμπλάστριον 4. Pap. κοτ 6. λειχῆνας 7. θείου

1. της χαρ[: If της is the article, we probably have τῆς χαρ[τηρίας κεκαυμένης], which was the last line of a recipe. For χαρτηρία (= χάρτης), manufactured papyrus, used in medicine, cf. Gal. XII 94; Dsc. I 86. The latter has πάπυρος γνώριμος πᾶσιν, ἀφ' ἧς ὁ χάρτης κατασκευάζεται, εὔχρηστος δὲ εἰς τὴν ἰατρικὴν χρῆσιν ..., "papyrus, from which paper is made, is known to all; it is especially useful for medicinal purposes;" ad fin.: ἡ δὲ κεκαυμένη πάπυρος ἄχρι τεφρώσεως δύναται νομὰς ἐπέχειν τὰς ἐν στόματι καὶ παντὶ μέρει· βέλτιον δὲ ὁ χάρτης καεὶς δρᾷ τὸ τοιοῦτον. "Papyrus, being burnt until it becomes ashes, can hold back spreading ulcers, those on the mouth and in every part. But burnt manufactured papyrus does this even better." Cf. Marganne, p.373, for χαρτάριον and χάρτης in the papyri. See esp. PSI X 1180, 49-50, ἐπάνω δὲ το[ῦ] φαρμάκου χαρτάριον ἐπίθες, "place a small piece of papyrus over the medication."

After line 1 a space of one line was left blank in which are two wing-shaped signs (⌒⌒) to mark the end of one recipe and the beginning of another. The first sign was extruded into the margin, and it is likely that one or two further signs have been lost in the missing portion of the papyrus.

2-5. These four lines are the last lines of a page of the codex and contain the beginning of a new recipe which was continued at the top of the next page.

2. ἐνπλάστρι[ον (ἐμπλ-): a diminutive of ἔμπλαστρος. It was possibly followed by πρὸς λειχῆνας], aut sim. Cf. notes to lines 3-5 and line 6, below.

3-5. λιθαργύρο[υ: litharge, lead monoxide, is frequently found first in the lists of ingredients for plasters. Cf. E, 6, note, and 10. It occurs in our codex in six different recipes. λιθαργύρο[υ was followed by the amount and by another ingredient with its amount.

ἐλαίου κοτ(ύλ.) [: this was followed by the number of kotylai of oil and by another ingredient with its amount.

An illustrative plaster containing four ingredients and water is the following (Gal. XII 844): "the moist white plaster, which the medical practitioner Magnus used for the removal of lichens": λιθαργύρου (λιτ.) α, κηροῦ (λιτ.) α ἐλαίου (ξε.) α, ψιμυθίου (λιτ.) α, ὕδατος (ξε.) α. τρῖβε λιθάργυρον, ψιμύθιον καὶ τὸ ὕδωρ, καὶ ὅταν λειότερα γένηται, ἐπίβαλλε κατὰ μικρὸν τὸ ἔλαιον καὶ τρῖβε συνεχῶς, καὶ ὅταν ἑνωθῇ, μετέρα εἰς ἀγγεῖον κεραμοῦν καὶ ἐπιτίθει ἐπὶ τὸ πῦρ συνεχῶς κινῶν. ὅταν δὲ τὸ ὕδωρ ἀναποθῇ, ἐπίβαλλε τὸν κηρὸν καταπλάσας, καὶ ὅταν διαλυθῇ, εἰς θυείαν μετεράσας καὶ μαλάξας ἀνελόμενος χρῶ. "One lb. of litharge, one lb. of wax, one sextarius of oil, one lb. of white lead, and one sextarius of water. Pound together the litharge, white lead and water, and when they have become finely powdered, add the oil little by little, and rub again continuously. When it is well united, pour the mixture into a clay vessel and place over a fire, stirring continuously. When the water is absorbed, add the wax, and when it is diluted pour the mixture into a mortar, and having made it pliable, take it up and use." Other plaster-recipes, which have only four ingredients, two of which are litharge and oil, are the following: Gal. XIII 378, 4; 423, 15; 690, 8; Aët. XV, p.112, 9; Paul. III 79.5; IV 14.2.

6-10. These lines are in the second hand. The writer left no space between his first line and the preceding text, but he extruded his lines 1.5 cm. into the margin. The recipe is for lichen-like skin eruptions, for which see the many compositions in Gal. XII 830-844. An illustrative recipe is the τροχίσκος λειχηνικός (832, 18): ἀλκυονίου κεκαυμένου (δρ.) β, χαμαιλέοντος μέλανος (δρ.) δ, ἀσφοδέλου ῥίζης (δρ.) δ, θείου ἀπύρου (δρ.) β, λιβανωτοῦ (δρ.) β, πυρέθρου (δρ.) β, νίτρου ἀφροῦ (δρ.) β, ταυροκόλλης (δρ.) δ, ὄξους τὸ αὔταρκες. "2 drachms of burnt alcyonium, 4 dr. of black chameleon, 4 dr. of root of asphodel, 2 dr. of unfired sulphur, 2 dr. of rosemary, 2 dr. of pellitory, 2 dr. of sodium carbonate, 4 dr. of bull-hide glue, and enough vinegar." Cf. the recipes in PSI X 1180, 33-50, πρὸς λιχῆνας ἀγρίους, et al., with many of the same ingredients.

6. πρὸς λιχῆ[νας: If θίου ἀπύρου in line 7 was the first ingredient of the recipe, the remainder of line 6 may have held amplification of the lichens, or further similar affections. Cf. Aët. VIII 16, p. 423, 10, πρὸς λειχῆνας ἐν παντὶ τόπῳ τοῦ σώματος; 423, 24, πρὸς λειχῆνας, πρὸς τοὺς ἀγρίους λειχῆνας; 424, 12, περίχριστος ἐφθὴ πρὸς λειχῆνας χρονίους; 424, 5, πρὸς λειχῆνας καὶ ἀλφοὺς καὶ λέπρας; PSI X 1180, 36, πρὸς λέπρας καὶ ἀγρίους λιχῆν(ας) καὶ ψώρας εὐδοκιμῶν, "a famous medication for leprosy, wild lichens, and scurvy."

7. θίου (θείου) ἀπύρου: "unfired sulphur". In 21 successive λειχηνικῆ-recipes in Gal. XII 832-838, this ingredient is found in 18 of them. It is also found in PSI X 1180, 37 and 42.

τήλε[ως: "fenugreek". Only one recipe of Galen's 21 λειχηνικαί calls for this ingredient, 834, 12.

8. μετὰ τῶν ξηρῶν: "with the powdered dry ingredients," i.e. θεῖον, τῆλις, and the following ingredients in line 7 and perhaps others after λιχῆ[νας in line 6.

χ.[: The remnant of ink is a tiny oblique stroke that would especially suit upsilon in this hand. The ingredient should be the first of the solubles, which were continued in the next line with unsalted fat and bull-hide glue. For the structure, see 838, 10ff., where the minerals are listed first followed by directions for their preparation; then the plants are listed with directions, and finally the list of τὰ τηκτά which includes κηροῦ, τερμινθίνης, and χαλβάνης, "wax, terpentine, and the resinous juice of all-heal." χαλβάνη is found in several other recipes for lichens and related affections. Cf. 843, 9; 844, 1; 846, 4. The only other ingredients which begin with χ in Galen's 21 recipes are classed as ξηρά: χαμαιλέοντος (6 recipes), χαλκάνθου (7), χαλκίτεως (6), χαλκοῦ λεπίδος (2), and χαλκοῦ (1).

Also possible for χ.[is χυ[λοῦ. Cf. 831, 9, μαλάχης ἀγρίας τοῦ καρποῦ ἁπαλοῦ ... τὸν χυλόν, "the juice of the raw fruit of the marsh mallow"; 831, 11, ἀνδράχνης χυλόν, "juice of purslane". Both juices were used alone as ointments for lichens and similar affections. Another recipe for lichens, 842, 12, calls for θαψίας χυλοῦ, "juice of deadly carrot".

9. ἀνάλου: "unsalted". The noun in the lost portion of the preceding line was almost surely στέατος, "fat". None of Galen's 21 successive recipes calls for fat. But the yellow plaster of Herophilus (843, 8), a λειχηνική, calls for στέατος μοσχείου, "calf-suet". For a cataplasm for chilblains with στέατος χοιρείου ἀνάλου, "unsalted young pig fat", see Dsc.Eup. I 171.4. Cf. also Gal. XII 677, 16; 21 A, 8-9, note, and footnote 34.

ταυρ[οκόλλης: "bull-hide glue". This ingredient is found in 5 of Galen's 21 λειχηνική-recipes, mentioned above (see note to lines 6-10).

P.Mich. Inv. 21 L verso 5.8 x 6.5 cm.
Plate 12b

- - - - - - - - - - - - - - -
].....
]ς παλαι
] ἄριττον

(Hd.2) 4]μα καρδαμώμου
].ου ἀνὰ (οὐγ.) η ναπείου
]
]σας δίδου πίνειν
8 κε]νταυρίου (οὐγ.) γ
κοχ]λιάρια ἓν

3. ἄριστον 9. κοχλιάριον

1-3. These are the last three lines of a page of the codex. For the probable content see note to 21 I, 1ff.

2-3. An illustrative supplement is the following: πρὸς τὰ]ς παλαι|[ὰς βῆχας φάρμακον] ἄριστον, "the best remedy for chronic coughing." Cf. Dsc. III 6.3 re κενταύρειον (which occurs in our text at line 8): ἀρμόζει δὲ ἡ ῥίζα ῥήγμασι, σπάσμασι, πλευριτικοῖς, δυσπνοίᾳ, βηχὶ παλαιᾷ, κτλ. "The root is good for fractures, muscular sprains, pleurisy, shortness of breath, chronic coughing, etc." Cf. also Alex.Trall. II 181, 19 ἄλλο (ἀντίδοτον) ποιοῦν καλῶς καὶ μάλιστα πρὸς τὰς χρονίας βῆχας. "Another antidote which is especially effective for coughs of long standing."

4-9. These lines are in the second hand and contain three separate recipes (lines 4-6, 7, and 8-9). A space of 1.5 cm. was left between lines 3 and 4, and a margin of 1 cm. remains below line 9.

4-5. καρδαμώμου, ναπείου: Cardamum and mustard are the only ingredients preserved in the first recipe, plus the ending of another,].ου. They are reminiscent of an anodyne of Galen for coughs and the expulsion of gas (XIII 59, 10ff.): ἄλλο (κοπτάριον) πρὸς βῆχα καὶ ἀναγωγὴν πνεύματος, πάνυ καλῶς ἐκκαθαῖρον. ὑσσώπου, γλήχωνος ἀνὰ (οὐγ.) β, ἴρεως, νάπυος σπέρματος, καρδαμώμου ἀνὰ (οὐγ.) α, ἀνίσου, πεπέρεως ἀνὰ (οὐγ.) α. κόψας, σήσας ἀναλάμβανε μέλιτι ἀπέφθῳ, ἡ δόσις κοχλιαρίου καλοῦ. "Another lozenge for coughs and the expulsion of gas. It is also a very good cleanser. Of hyssop and pennyroyal, 2 oz. each; of iris, mustard seed, and cardamum, 1 oz. each; of anise and pepper, 1 oz. each. Pound the ingredients and put through a sieve. Take with boiled honey. The dose is a good spoonful." Of the five ingredients in addition to cardamum and mustard, only ὑσσώπου and ἀνίσου end in -ου, and since the remnant of a letter in line 5 of our text before ου is a vertical, the original text may well have had ὑσσώ]που. And line 4 may have had [πρὸς βῆχα καὶ ἀναγωγὴν πνεύματος πότη]μα, aut sim. For πότημα, see 21 J, 7.

6. This partial line had the amount of mustard - perhaps seed of mustard - and the directions for taking the medication.

7. The remedy in this line was complete in the space of one line. For many very brief recipes for pills and potions for internal disorders, cf. the "common" or "family medications" of Galen in his Περὶ εὐπορίστων (XIV 450ff.). Many end with δίδου πίνειν, as in our line 7, e.g., 450, 16 πρὸς τὰς τοῦ στομάχου ἀτονίας. σίνηπι πεφρυγμένον λεῖον μετὰ ὕδατος δίδου πίνειν. "For weakness of the stomach give pounded burnt mustard with water to drink." 451, 18 ἄλλο. τὸ σινήπεως σπέρμα κεκαυμένον τρίψας καὶ σὺν ὕδατι δίδου πίνειν. "Finely rub the burnt seed of mustard and give as a potion with water."

Our text has]σας before δίδου πίνειν. Cf. 456, 3 ἄλλο. βοτάνην ὑπερικὸν καὶ ἀδίαντον ἐν ὕδατι ἑψήσας δὸς πιεῖν. "Give as a potion the herb St.John's wort and maidenhair boiled in water." 457, 10 ἄλλο. γῆς ἔντερον λειοτριβήσας δίδου πιεῖν. "Give as a potion finely-pounded earth-worms." 461, 9 ἄλλο. καππάρεως ῥίζαν κοπανήσας καὶ ζέσας μετ' ὄξους καὶ μέλιτος δίδου πιεῖν νήστει. "Finely pound and boil the root of the caper-plant with vinegar and honey,

and give to drink on an empty stomach." 466, 14 ἄλλο. κυίκον καὶ τήλεα τρίψας καὶ ἑψήσας δίδου ἀφέψημα πίνειν. "Finely pound and boil safflower and fenugreek and give the decoction as a potion." For the papyri see P.Oxy. VIII 1088, 44.55.61; P.Ryl. III 531,11; PSI VI 718,5.

8-9. κε]ν̣τ̣αυρίου (οὐγ.) γ, 3 oz. of centaury: cf. Dsc. III 6 and 7; Gal. XII 19ff.; and note to lines 2-3, above. Cf. also P.Oxy. VIII 1088, 56ff.

κοχ]λ̣ιάρια ἕν: read κοχλιάριον ἕν. Cf. Gal. XIV 458, 17 for one of the brief recipes for splenetic ills, ἄλλο. κενταυρίου λεπτοῦ γεγηρακότος, κοπτομένου ἐν ὄλμῳ δίδου κοχλιαρίου τὸ πλῆθος ἀπυρέτοις. "Pound fine in a mortar full-grown centaury, the slender variety, and give a spoonful to patients without fever." 467, 15 Another, for gastric diarrhoea: καρυῶν φλοιὸν τὸν περικείμενον περὶ τὰ τρωγόμενα, λεῖον δι' ὕδατος, δίδου πιεῖν κοχλιάρια γ. "Give 3 spoonfuls of a potion made of the skins of nuts, those which lie next to the nutmeats, which have been pounded fine with water." 521, 13, for flatulence of the stomach: πεπέρεως, δαφνίδων, κυμίνου, ἀνίσου ἴσα κόψας καὶ σήσας δίδου νήστει μετὰ εὐκράτου κοχλιάριον α, ἐπὶ ἡμέρας τρεῖς. "Pound and sift equal amounts of pepper, bayberries, cummin, and anise, and give one spoonful with mixed wine and water, on an empty stomach, for three days."

P.Mich. Inv. 21 M 8.3 x 7.2 cm.

Plate 13a

- - - - - - - - - - -
[.].[
χεαι κατα[
δυνης πρὸς ...[
4 τὰ νῦ γ̔ματα .[

(Hd.2) κ̣.....[.].. πίσσας κ[
.. (οὐγ.) ᾱ [....]ος (οὐγ.) γ ψι[μιθίου
....[.....] καὶ εστι[
8 πρὸς [σῦ]ριγγας κα[ὶ
σύριγγα κ[α]ὶ ῥῆγμ[α
ὠμῆς ἐπ[ὶ] μύσεω[ς
ἢ φοῦ τὸ λευκὸν [

2. χεαι: χ corr. fr. δ. 4. γ inserted above the line by the original scribe.

1-4. These lines are the last four lines of a page of the codex and are the concluding lines of a recipe, as shown by the unusually deep lower margin (5.5 cm.) and the wedge-shaped signs placed by the scribe below the text. Lines 3-4 relate to the uses of the plaster, while line 2 may have held the final direction for its composition.

2. χεαι: Possible verb forms are χέαι, aor. inf. of χέω, and χέαι = χέε. But the uncompounded verb is rarely used; while ἐπι-, ἀπο-, παρα-, and συν-χέω are frequently found in the directions for mixing medications. Cf., e.g.

Aët. XV, p. 108, 15ff. for the conclusion of a recipe for scrofulous swellings of the glands of the neck (χοιράδες) and for all indurations: καὶ ἑνώσας τῆκε πιτυΐνην καὶ ἔλαιον, καὶ διηθήσας ἐπίβαλλε τὴν πρόπολιν προμεμαλαγμένην· καὶ τακείσης ταύτης ἐπίπασσε τὴν γῦριν, καὶ ἑνώσας ἐπίχεε τοῖς λειωθεῖσιν ἐν θυίᾳ, καὶ συμμαλάξας ἱκανῶς χρῶ. "Having mixed them together, melt the pine resin and oil, and having strained it add the previously softened bee-glue. Then sprinkle over the melted mixture the fine meal, and, having mixed them together, pour it over the powdered dry ingredients in a mortar. Make the medication sufficiently malleable and use."

3. ὀ̣υ̣ν̣ης: Possibly ὀ]|ὀύνης. Cf. Gal. XII 677, 4: εἰσὶ δὲ καὶ ἔμπλαστροι πολλαὶ διαφοροῦσαι παρωτίδας, αἱ μέν τινες τὰς ἤδη σκιρρουμένας καὶ κεχρονισμένας, αἱ δὲ τὰς πεπαυμένας μὲν τῆς ὀδύνης ... "There are many plasters which disperse tumors of the parotid glands, some of which are already indurated and chronic, and which cause the pain to cease." XIII 967, 15 πρὸς τὰς τῶν ἄρθρων ὀδύνας, "for pains of the joints." Paul. VII 17.46 ἡ Νέρωνος πρὸς πλήγματα καὶ πᾶσαν ὀδύνην τῶν σαρκωδῶν μορίων, "the plaster of Nero for blows and all pains of the fleshy parts."

πρὸς ...[: Possibly πρὸς λ̣υ̣γ̣[ίσματα καὶ] or πρὸς ἐ̣ξ̣α̣[ρθρήματα καὶ]. See the following note.

4. τὰ νῦ̀γ̀ματα: "lesions of the tendons", as opposed to ἕλκος, flesh-lesions, and κάταγμα, bone-lesions (LSJ). Cf. Gal. XIII 547, 8, a plaster of Heras, ἀφλέγμαντος πρὸς τὰ νύγματα καὶ κατάγματα. ταύτῃ πολλάκις καὶ ἐπὶ ἐξαρθρήματων αὐθήμερον ἐχρησάμεθα καὶ καταγμάτων ἐπί τε λυγισμάτων τῶν περὶ σφυρὰν ἢ γόνυ. "An inflammation-inhibiting plaster for tendon-lesions and fractures. Many times we have used this composition immediately for dislocations, fractures, and sprains of the ankle or knee."

.[: Possibly κ̣[αὶ κατάγματα]. See the preceding note. Also possible is one of the following conditions found with νύγματα (Aët. XV, p. 82, 8): ποιοῦσα πρὸς πληγὰς, καὶ κρούσματα, στρέμματα, σπάσματα, ῥήγματα, νύγματα, "the plaster is good for strikes, blows, sprains, muscle-strains, breaks, and tendon-lesions."

5-11. These lines are in the second hand. The writer left a 1.5 cm. space between his lines and the preceding text, and he began his lines 1 cm. to the left of the margin set by the text above. Four symbols (see text) have been placed in the margin opposite lines 5-6, 7-8, 9, and 10, which may indicate approval of separate recipes, or of special uses of a single recipe with different liquids. The papyrus has been severely damaged by abrasion and a large hole.

5. κ̣.....[.]..: καταγματική is too long for the space and does not fit the remnants of ink.

πίσσας κ[: Possibly πίσσας κ[ηροῦ ἀνὰ (οὐγ.), "pitch and wax, so many ounces of each." Cf. 21 B, 9. κ[ολοφωνίας is also possible.

6. [....]ος: Possibly [μίcυ]ος, misy. cτέατος is usually qualified by the type of animal fat.

ψι[μιθίου: "white lead" is found in five recipes in our codex. For the spelling see A, 10, note.

7. ....[.....] καὶ εcτι[: Possibly ἔμπλ[αcτρος] καὶ ἐcτὶ [ἀγαθή, aut sim. "It is a good plaster" for ...

8. πρὸc [cύ]ριγγαc κα[ὶ: "for abscesses and ..." Cf., e.g., Gal. XIII 520, 15 κολλᾷ δὲ καὶ κόλπουc καὶ cύριγγαc, "the plaster agglutinates fistulous ulcers and abscesses"; 807, 14 πρὸc cύριγγαc καὶ τὰ μελαινόμενα ἢ νομάc, "for abscesses, blackened flesh, or spreading ulcers." Cf. C, 10 and note ad loc.

9. cύριγγα κ[α]ὶ ῥῆγμ[α: Possibly πρὸc] | cύριγγα κ[α]ὶ ῥῆγμ[α μετὰ ἐλαίου, aut sim. "For an abscess or a break triturate with oil, aut sim." Cf. D verso, 2-9, with notes.

10. ὠμῆc: "raw, crude", of minerals; "uncooked, unripe", of fruits and plants. The noun, lost at the end of the preceding line, was feminine.

ἐπ[ὶ] μύcεω[c: "for closing of." Cf. LSJ for references for μ. cτομίων, cτομάχου, πόρων. Cf. also Dsc. I 56 (p. 52, 20) re ῥινον; II 102, re τῆλιc; Dsc. Eup. II 72 τὰc δὲ φλεγμονὰc τῆc ὑcτέραc καὶ μύcειc καὶ ἀλγήματα ἀφεψόμενα εἰc ἐγκαθίcματα ὠφελεῖ κτλ. "Decoctions for sitz-baths are beneficial in cases of inflammations of the womb, closings, and pain."

Also possible in our text is μύcεω[ν and ἐπ[ι]μύcεω[c or -[ν. For the latter see Sor. 2.18.

11. ἢ ῥοῦ τὸ λευκόν: "or the white of an egg." Cf., e.g., Paul. III 59.5 ἄλλο. πρὸc φλεγμονὴν ἀκτυλίου· ... ἢ ψιμύθιον καὶ ῥοῦ τὸ λευκὸν καὶ ῥόδινον ἐν τῷ αὐτῷ ἰγδίῳ λειώcαc ἕωc γλοιῶδεc γένηται, κατάχριε. "Another ointment for inflammation of the anus. White lead with the white of an egg and rose oil, triturated in the same mortar until it has the consistency of a thin oil. Anoint the patient." Cf. C verso, 7.

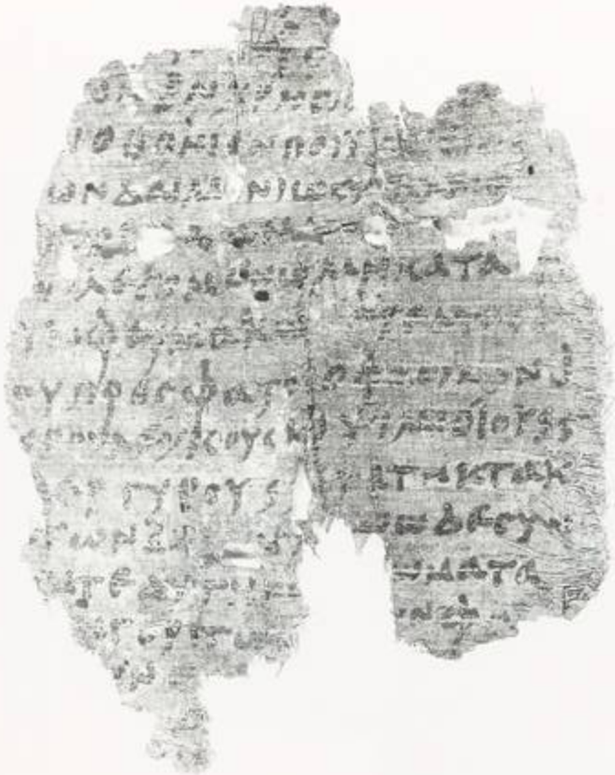
P.Mich. Inv. 21 M verso 8.3 x 7.2 cm.
Plate 13b

- - - - - - - - - - - -
]μαc
] (δρ.) κβ κηροῦ
].ηο...κειε
4].. αὐτὴν γενε-
]θηcα.ε.ε. cυν
(Hd.2)]...τα. προ[....]ια.[.].α
]....[.] πρὸc [....]
8]...β.[.]επι[....]
].cυ[...].[....]
].τηcο( ) .[....]
]..ην[....]

1-5. These are the ends of the last five lines of a page of the codex. The papyrus has suffered considerably from abrasion, even more than the recto side. See note to M, 5-11, ad fin.

6-11. These lines are in the second hand. The writer left no space between his lines and the preceding text. The severe damage to the papyrus makes any comments valueless.

INDEX OF WORDS



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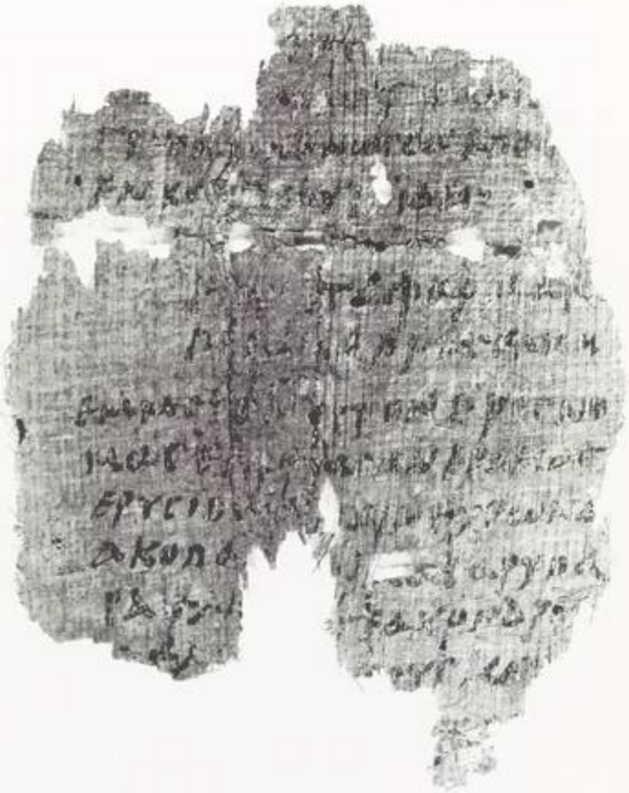

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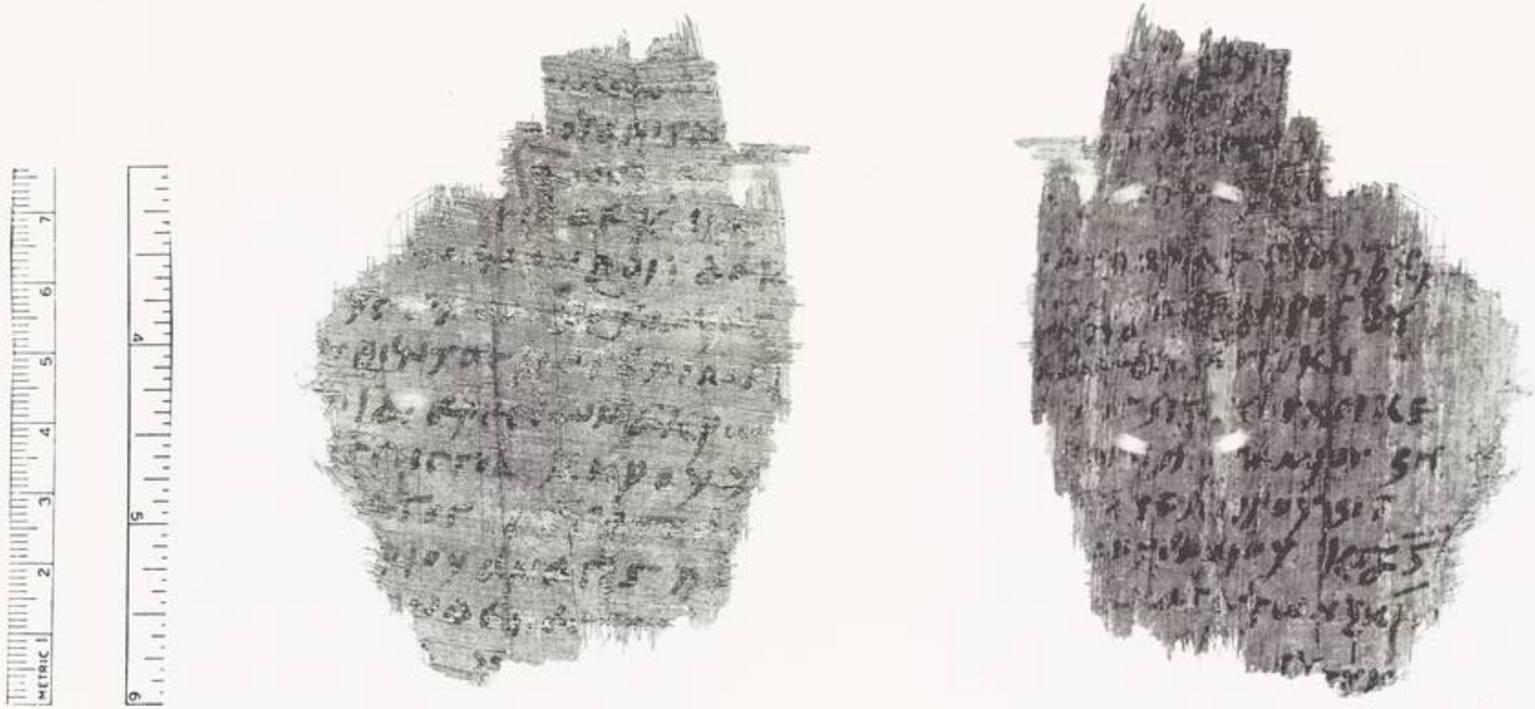

a) b)

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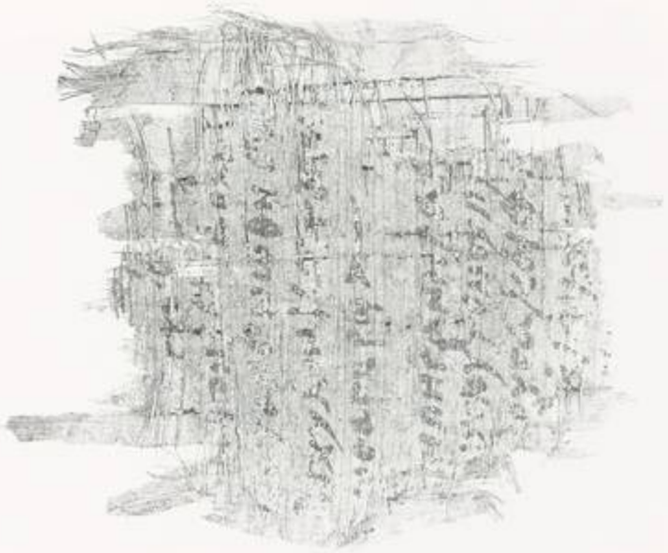
b) P.Mich. XVII 758 (inv.21) B verso (pages 17-8)

PLATE 3

b)



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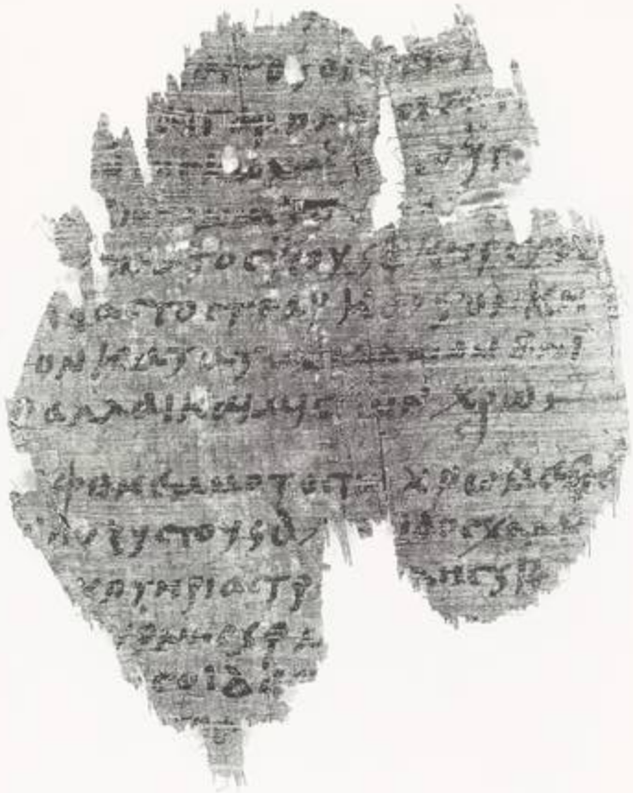

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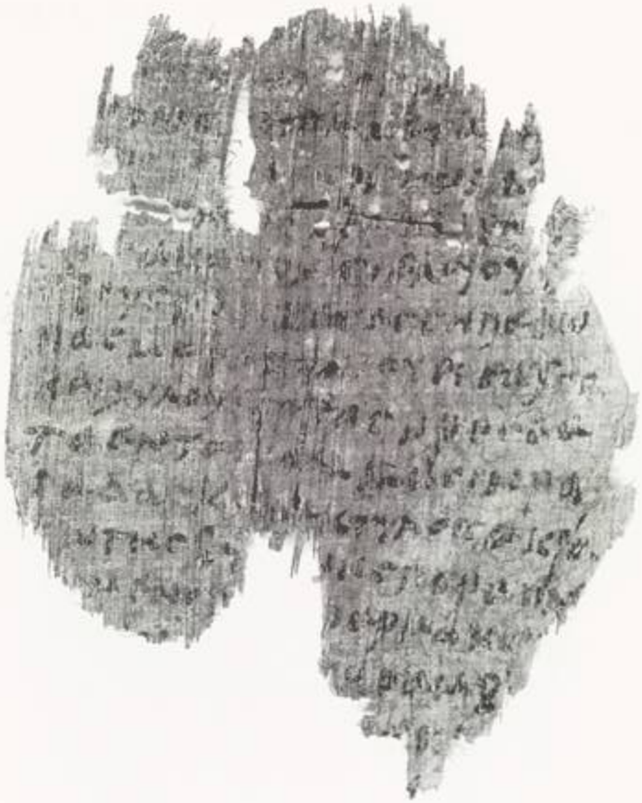

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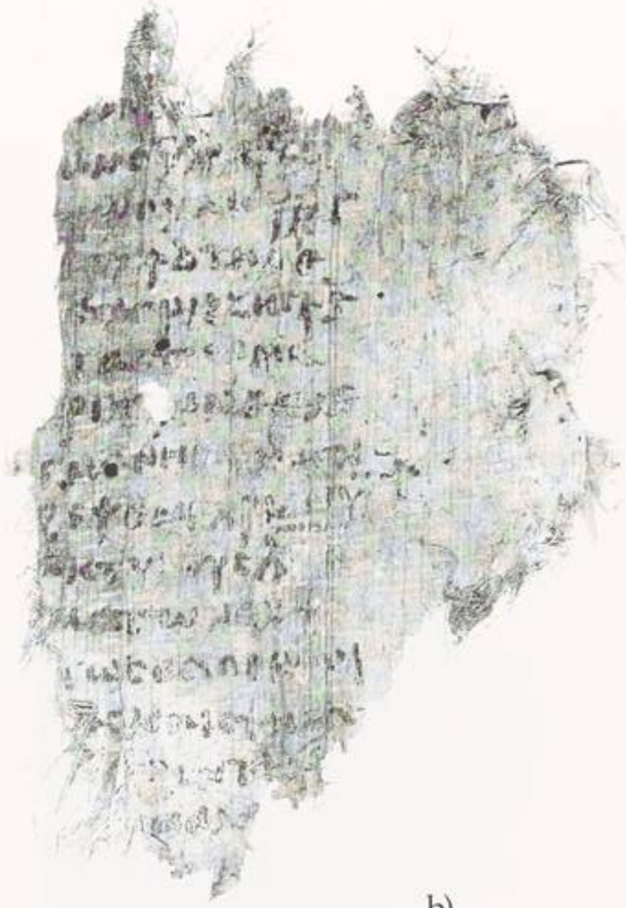

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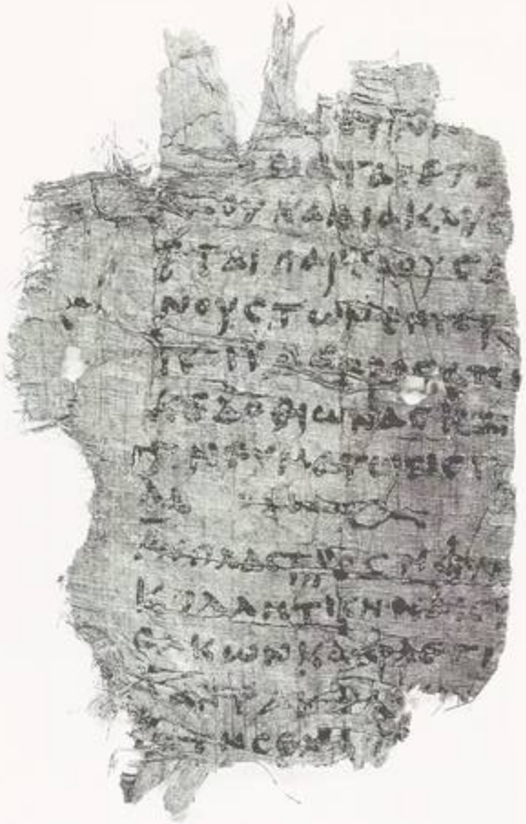

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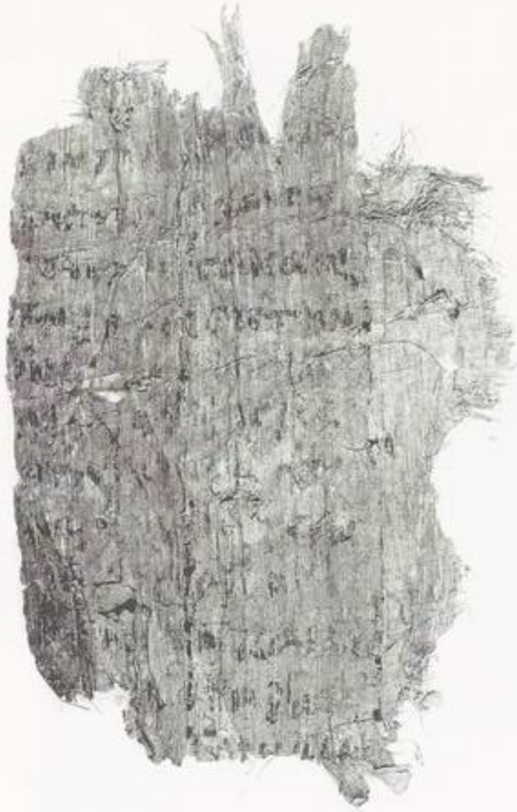
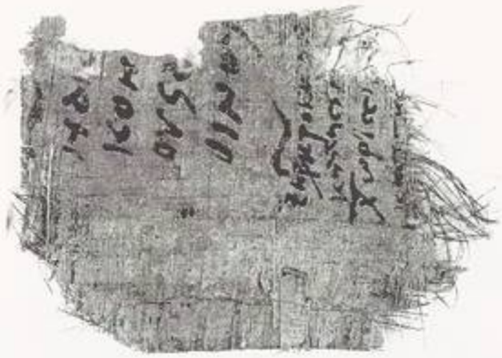


b)

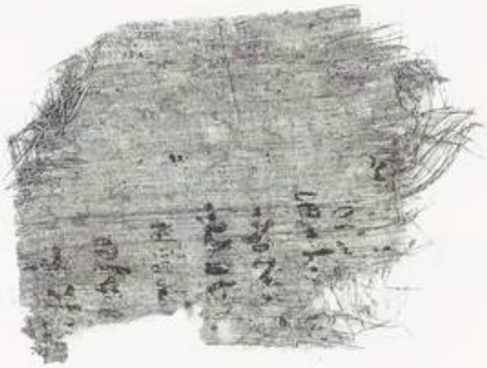
a) P.Mich. XVII 758 (inv.21) F recto (page 49)
b) P.Mich. XVII 758 (inv.21) F verso (page 53)

PLATE 6

PLATE 7

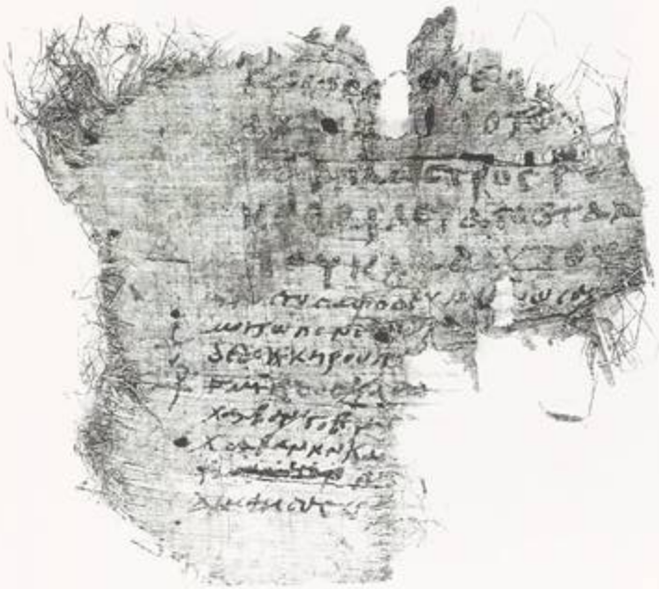


a)

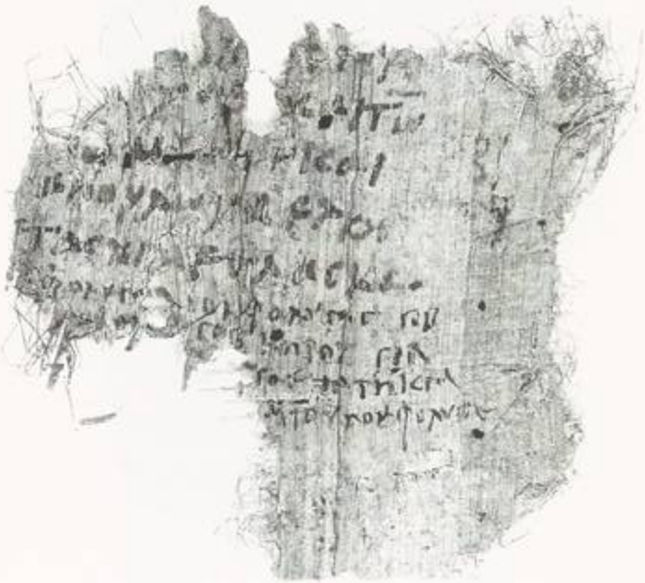


b)

a) P.Mich. XVII 758 (inv.21) G recto (page 56)
b) P.Mich. XVII 758 (inv.21) G verso (pages 58-9)



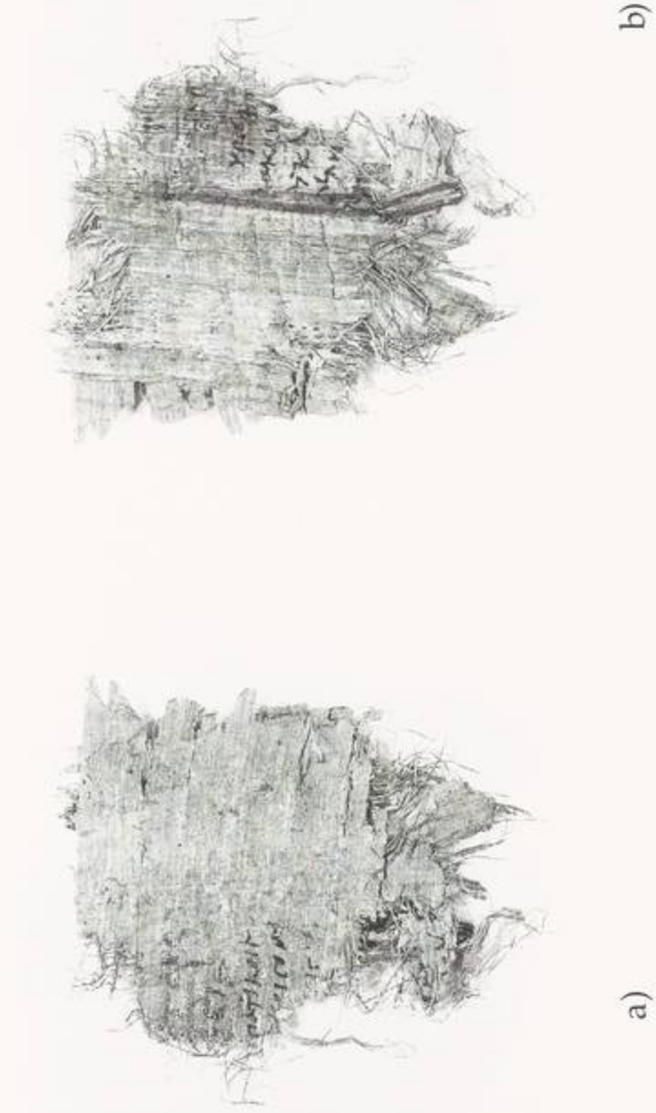
a)



b)

a) P.Mich. XVII 758 (inv.21) H recto (page 59)
b) P.Mich. XVII 758 (inv.21) H verso (page 61)

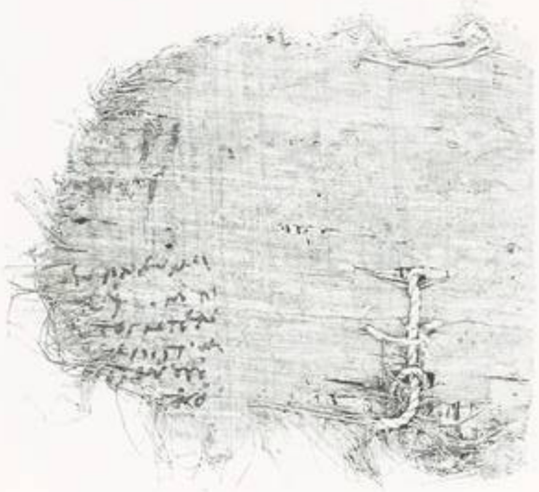
PLATE 9



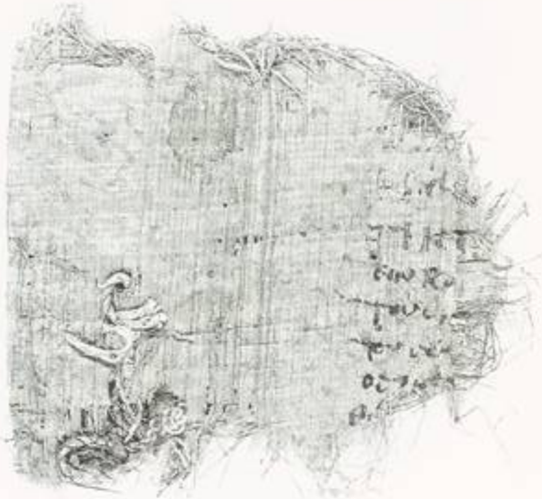
a) b)

a) P.Mich. XVII 758 (inv.21) I recto (pages 63-4)
b) P.Mich. XVII 758 (inv.21) I verso (page 65)

PLATE 10

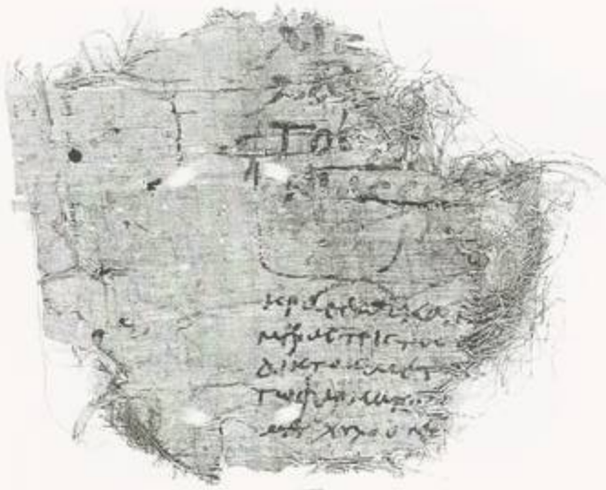


a)



b)

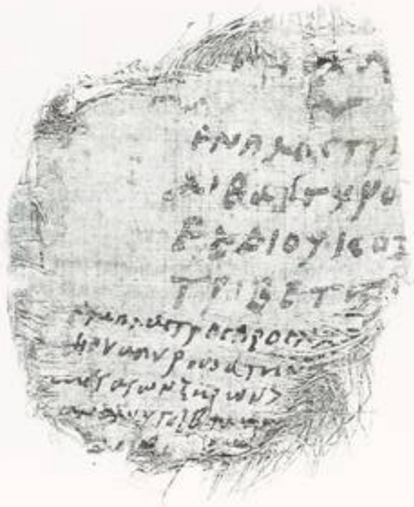
a) P.Mich. XVII 758 (inv.21) J recto (pages 66-7)
b) P.Mich. XVII 758 (inv.21) J verso (page 68)



a)

b)

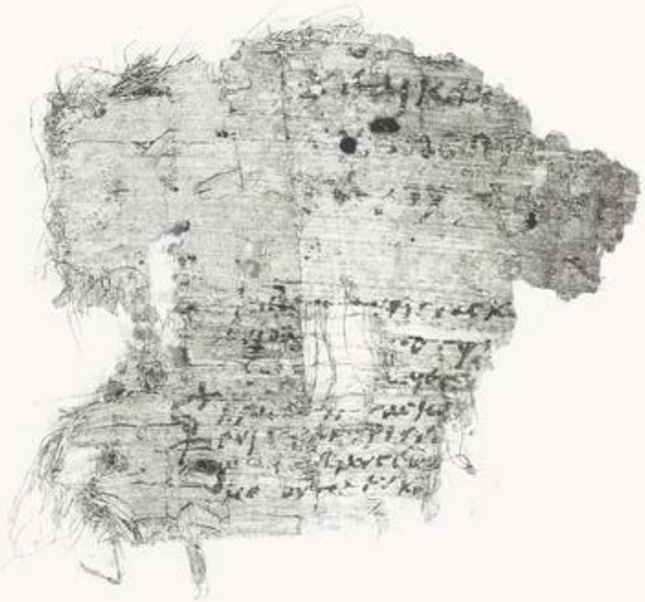
a) P.Mich. XVII 758 (inv.21) K recto (page 69)
b) P.Mich. XVII 758 (inv.21) K verso (page 71)



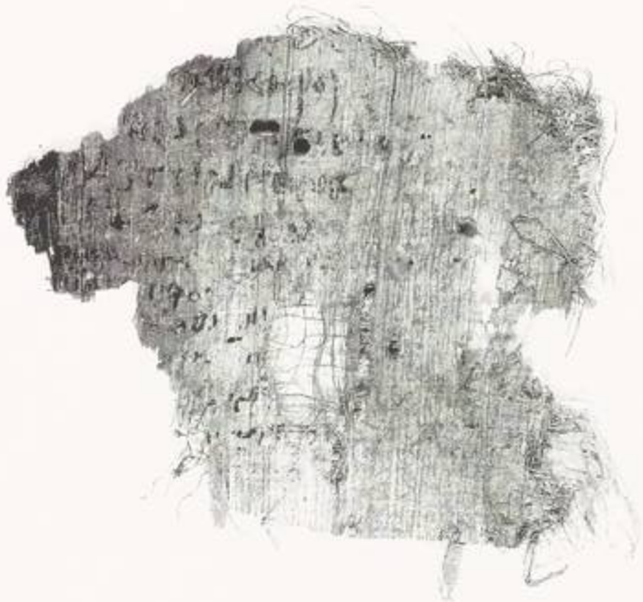
a)

b)

a) P.Mich. XVII 758 (inv.21) L recto (page 72)
b) P.Mich. XVII 758 (inv.21) L verso (page 74)



a)



b)

a) P.Mich. XVII 758 (inv.21) M recto (page 76)
b) P.Mich. XVII 758 (inv.21) M verso (page 78)