

SQUILL IN ANCIENT AND  
MIEVEAL MATERIA MEDICA,  
WITH SPECIAL REFERENCE TO ITS  
EMPLOYMENT FOR DROPSY\*

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IT has long been recognized that in classical antiquity, as in the Middle Ages, plants and plant products were widely used for a variety of practical purposes including, of course, drug therapy. But, contrary to the impression gained by reading the more lurid accounts of *mandragora*, *arbre sec*, *yggdrasil*, *spina christi*, and the like, those uses were based on first-hand experience with the living plant known from and collected in its native habitat. While it is true that ancient and medieval writers did not make the taxonomic and nomenclatural distinctions which we are accustomed to make today, most of the plants mentioned in such writings can be identified satisfactorily today, at least to the generic rank. It is sometimes difficult, however, to explain in modern terms the rationale for their various uses, especially their therapeutic uses. Moreover, it is virtually impossible to determine when and how a particular plant came to be used for a specific complaint. It is probably correct to imagine a long period of folk use proceeding by trial and error but there is, unhappily, little documentary evidence to support such a conjecture. These obstacles notwithstanding, ancient and medieval knowledge of plants and their uses can be reconstructed in some detail. A case in point concerns squill and its role in materia medica.

The early history of the medicinal uses of squill is, however, by no means a simple story.<sup>1</sup> In the present study no attempt has been made to mention every writer who referred to squill or to paraphrase every reference to squill found in ancient and medieval texts. Rather, the most important texts have been chosen, along with a selection of

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texts of lesser importance, in order, first, to illustrate the complexities of a tradition which lasted two millennia and second, to illustrate the more specific uses of squill in the treatment of dropsy.

In addition to a fragmentary record for the pre-Hippocratic period, the history of the therapeutic uses of squill is complicated by three other factors. 1) Squill was used in the treatment of many complaints other than dropsy. 2) Dropsy was treated by operation and dietetic regimen as well as by drug therapy, which included many plants in addition to squill. 3) Literary diagnoses are notoriously unsafe and dropsy is no exception. But rather than try to avoid these difficulties by an oversimplification, I shall attempt to account for them within the context of ancient and medieval materia medica by the liberal use of passages from a wide range of contemporary documents.

The word squill is an anglicized form of Latin *scilla* (late Latin *squilla*), and cognate to other modern European names derived ultimately from Greek *σκίλλα* (*skilla*) or *σκίλλη* (*skillē*). The pre-Greek etymology and Indo-European root are not certain, as the abundance of hypotheses testify.<sup>2</sup> It is clear, however, that squill was known to the Greeks at an early period, perhaps borrowed from the Egyptians,<sup>3</sup> although the first literary evidence is post-Homeric.<sup>4</sup>

Before we proceed further, a few remarks on the botanical description, nomenclature, and taxonomy will provide a basis for comparison with the ancient and medieval passages to follow.

A nontechnical description will best convey the general appearance of the squill, *Urginea maritima* (L.) Baker:

An unmistakable plant either in the spring with its broad strap-shaped leaves growing out of huge bulbs, or in the late summer when the tall spikes of white flowers grow leafless from the dry ground. Bulbs up to 15 cm. across with broad lance-shaped, more or less flat shining leaves, 3-6 cm. across, appearing in the autumn and lasting till summer. Flowering stems robust, 1-1½ m. high, with very numerous stalked white flowers in a long dense cylindrical spike; the lower flowers open first and flowering continues gradually upwards. Petals white, blunt and green-nerved; anthers greenish. HABITAT: sands, rocks and dry hills; circum-Medit. August-October.<sup>5</sup>

Three further details, whose relevance will appear below, require

only a brief mention. First: squill is not winter-hardy, though it makes a successful if somewhat uncommon house plant.<sup>6</sup> Second: there are two color varieties of the squill bulb: red and white. There has been much difference of opinion as to their comparative physiological activity, but taxonomically the color variations appear to be of little significance.<sup>7</sup> Third, the bulb will sprout and, it is reported, will occasionally blossom, without being placed in the soil.<sup>8</sup>

The accepted scientific name of the squill was created a century ago by John Gilbert Baker (1834-1920), for many years associated with the Royal Botanic Gardens at Kew. In 1872 Baker published the second of his monographs on the genera of the lily family (*Liliaceae*).<sup>9</sup> For the present purposes, it may be noted that he distinguished five genera of the tribe *Scilleae* of the *Liliaceae* and separated, on the basis of differences in the perianth and seed morphology, the two genera *Urginea* and *Scilla*. Up to the time of Baker's revision, these two genera were either not distinguished or only imperfectly distinguished, despite the creation of the new genus *Urginea* in 1834 by Adolphe Steinheil (1810-1839).<sup>10</sup> Prior to Steinheil's study, in which squill was termed *U. Scilla* Steinh., the plant was usually known by the older name *Scilla maritima* L., codified by Linnaeus in 1753.<sup>11</sup> Other names have been proposed, but in the taxonomic literature the three most common names are *U. maritima* (L.) Baker, *U. Scilla* Steinh., and *Scilla maritima* L.<sup>12</sup>

The earliest references to squill in Greek are, for the most part, nonmedical. But, as we shall later observe, the nonmedical and paramedical uses of squill have a bearing on the medical uses and cannot easily be separated.

There are, in addition, other reasons why the pre-Hippocratic references are important. For example, some significance attaches to the proverb "Neither rose nor hyacinth grow upon the squill."<sup>13</sup> This seemingly simple line, attributed to Theognis (*fl. ca. 544-541 B.C.*), establishes the fact that squill was well known. For had it been rare, or even uncommon, the proverb would have lost its point.

At approximately the same time, squill is mentioned in some other verses whose meaning is, however, less obvious. The passage in question comes from Hipponax (*fl. 540-537 B.C.*), an iambic poet of Ephesus, known today principally for the fragments of what were, presumably, colloquial satires. The subject of the passage is unknown

and the object is supplied solely on grammatical grounds: "Throwing [at him] in the winter [*or*, in the meadow] and beating [him] with twigs [? of the fig tree] and [leaves of] squills like a scapegoat."<sup>14</sup> There is no need here to enter into the metrical and orthographical questions that have beset scholars in their attempts to interpret this passage. From a botanical point of view, the facts, though not the context, are reasonably clear. First, the phrase "in the winter" makes better sense than the emendation "in the meadow" because the leaves appear *after* the blossom.<sup>15</sup> The plant, according to L. H. Bailey, flowers as early as July and August.<sup>16</sup> The blossom is succeeded by the long and broad leaves described above, which are well suited to Hipponax' purpose. A second point again concerns the leaves. Whatever may have been the reason for beating, or perhaps whipping—a well-known cultic ritual—squill leaves *and* fig twigs were ideally suited.<sup>17</sup> Several investigators have pointed out that contact with squill leaves may produce serious local irritation.<sup>18</sup> This property was already recognized in antiquity.<sup>19</sup> Thus squill leaves and the supple, lactiferous twigs of the fig tree would lend themselves to the use described by Hipponax.

The third of our early references adds further complexities but, at the same time, provides further evidence as to its use. Athenaeus (*fl. ca.* 200 A.D.), the learned author of the *Deipnosophistae* (*The Dining Wisemen*), was ever on the alert for poetical snippets illustrating the foods and drinks he and his colleagues enjoyed, though sometimes vicariously. In a gastronomic discussion foreshadowing Jean Anthelme Brillat-Savarin, the question arose concerning the identification of the plant known as *kaktos* (*Cynara carduculus* L.). In order to settle the matter, several lines were cited from Epicharmus, a fifth century Sicilian writer of comedy and perhaps of medical treatises as well, who flourished during the reign of Hieron, king of Syracuse (478-467 B.C.). The Epicharmian verses run as follows: "Poppy . . . fennel, and rough cactuses to eat among other vegetables." "And again he says," Athenaeus continues, "lettuce, palm buds, squills (*σχινον*) . . . radishes, cactuses."<sup>20</sup> Two points are noteworthy. First, the alimentary use of squill is quite uncommon. But judging from the other vegetable products, perhaps the leaves were employed as a salad.<sup>21</sup> This interpretation is confirmed by yet another reference to squill, also preserved by Athenaeus.<sup>22</sup> In this case, two verses from Anaxandrides (*fl.* 382-349), a minor writer of the Middle Comedy, are apposite:

Cutting some asparagus, squills (*σχίνον*) and marjoram, which, as everyone knows, when mixed with coriander, give distinction to smoked fish.

The verses of Epicharmus, and Anaxandrides as well, are important for a second reason. The word squill, in those verses, is a translation of *σχίνος* (*schinos*), rather than the more common *σκήλλα*. The context suggests that the synonymy *σκήλλα/σχίνος* was well-established for otherwise, like the proverb noted above, it would be pointless.

Usually *σχίνος* denoted mastic, the gum produced by the lentisk (*Pistacia Lentiscus* L.).<sup>23</sup> Often known under the trade name of Chian mastic, from the island of Chios, mastic was chewed as a breath sweetener and entered into a variety of composita.<sup>24</sup> Because of the presence of a bitter principle, it also served as an expectorant and stimulant, much as did squill.

The synonymy *σκήλλα/σχίνος* was common in Greek but apparently it became archaic, for later writers made a point of recording their equivalence.<sup>25</sup> At an earlier time, the synonymy was sufficiently common that it served as a base for a pun. Plutarch (*ca.* 46-120 A.D.) reported that Pericles (*ca.* 495-429 B.C.) was dubbed "squill-head" (*σχινοκέφαλος*) by Cratinus (*fl.* 484 B.C.), the Athenian comic poet and perhaps a critic of Periclean policy.<sup>26</sup> It is still an open question whether that derisive term referred to Pericles' unusually shaped head or whether it was an opprobrious term, much like our "egg head," due to Pericles' association with sophists and "intellectuals." The sobriquet caught the public's fancy and was repeated later.<sup>27</sup>

An easy transition to the medicinal uses of squill is provided by Aristophanes (*ca.* 450-*ca.* 385 B.C.), the master of the old comedy. Though he was younger than Hippocrates, it will be convenient here to consider one passage from his *Plutus*. Produced in 388 B.C., this work contains a good-natured satire on Asclepius and the healing arts.<sup>28</sup> The relevant passage is a description of the preparation of a medicament by the attendant priest of the Asclepeion.

. . . first he set himself to mix a plaster . . . throwing in three cloves of Tenian garlic; and with these he mingled verjuice and squills (*σχίνον*); and brayed them up together. Then drenched the mass with Sphettian vinegar, And turning up the eyelids of the man, plastered their innersides, to make the smart more painful.<sup>29</sup>

Before we turn to the explicit medicinal uses of squill note should be taken of two semi-legendary figures, each of whom played a minor role in later squill lore.

Few factual data are recorded for Epimenides and even his dates are a matter of conjecture. But from the anecdotes preserved by later writers two pertinent items appear, although their connection is by no means clear. Near the end of Diogenes Laertius' biography of a typical wonder-worker, he noted that Epimenides "withdrew [i.e., from political life] and engaged himself in the collecting of roots and simples."<sup>30</sup> Whether this is only an inference from Theophrastus' account (see below) or is based on independent evidence, Epimenides' name became associated with squill. Theophrastus, about whom more will be said later, wrote:

Among edible roots are not only purse tassels and others which resemble them, but also the roots of asphodel and squill, though not of all kinds of the latter, but only the kind called "Epimenides" squill, which gets its name from its use.<sup>31</sup>

No further details are supplied by Theophrastus concerning its use. But from other sources it appears that that use was magical, and perhaps the apotropaic properties later attributed to squill go back, in fact, to Epimenides.<sup>32</sup>

Pythagoras (*fl. ca.* 531 B.C.), about whom an even larger number of legends centered, is involved in the early history of squill on somewhat slender grounds. Were it not for a frequent misunderstanding of Pliny by later writers, he would not merit attention here. At the conclusion of his account of squill, Pliny stated that Pythagoras devoted an entire book to squill. While it is remotely possible that he wrote such a book, as well as one on cabbage,<sup>33</sup> it is equally possible that this attribution is nothing more than an example of ascribing useful discoveries and inventions to a "culture hero."

It is significant that the earliest explicit reports of the medicinal uses of squill in classical antiquity are found in the *Corpus Hippocraticum*. There are numerous references in *Diseases of Women*,<sup>34</sup> the *Nature of Women*,<sup>35</sup> and elsewhere.<sup>36</sup> But none of the passages mentioning squill is concerned with dropsy nor in any of the more frequent references to dropsy and its treatment is squill mentioned.<sup>37</sup> As it is not our purpose here to consider all the drugs of vegetable origin mentioned by the Hippocratic writers, it will suffice to note that

squill was recommended for various uterine complaints,<sup>38</sup> as an emollient for open sores,<sup>39</sup> and once as an ingredient in an ophthalmological prescription.<sup>40</sup>

As noted, references in the *Corpus Hippocraticum* to dropsy—or, to be more precise, to morbid conditions characterized by the collection of fluids and edema, and hence translated as “dropsy,” “dropsical,” etc.—do not contain any reference to squill. However, the numerous references to dropsy *sensu lato* indicate that the symptom complex was not uncommon and that it had been observed sufficiently often that certain generalizations could be made. For example, a long description based on clinical evidence appears in *On Sufferings*,<sup>41</sup> and other references are scattered throughout the *Corpus*.<sup>42</sup> Finally, two of the *Aphorisms* help to define the later relations between dropsy and its therapy and the manifold uses of squill.<sup>43</sup> In particular, the surgical treatment of dropsy, referred to in *Aphorisms* VI, 27, should be compared with drug and regiminary therapy, both of which are clearly alluded to but not specified in any extensive detail in his work *On Sufferings*.

Turning now to the plant itself, the Hippocratic references contain an ambiguity of a type so common in late classical and medieval texts that it is worth pointing out here. Generally speaking, the mere mention of a plant name, a recommendation for its use—even its inclusion in a list of ingredients for a compositum—is no guarantee that the plant was actually available to the physician, that he used, or had used it, or that he had any personal knowledge of the plant itself. In the present instance, there is no reason to doubt the integrity of the Hippocratic writer. For, as we have seen, squill was well known to the educated public and it is, and presumably was, widely distributed in Greece and the Aegean Islands.<sup>44</sup> Still, the fact remains that there is no incontrovertible evidence that Hippocrates or the anonymous authors of the Hippocratic Corpus had any experience of squill beyond its preparation for purposes of administration.<sup>45</sup>

While there may be some doubt as to the extent of Hippocrates' personal knowledge of squill, all doubt is removed when we consider the accounts of subsequent writers. Squill is mentioned but once in the genuine writings of Aristotle (384-322 B.C.) but his comment that locusts deposit their eggs “in the stalks of squill” bears witness to his powers of observation.<sup>46</sup> In two other texts, both of which were

formerly attributed to Aristotle, there are descriptions which, despite some questionable plant physiology, unmistakably derive from observation of the living plant.<sup>47</sup>

A more complete description was given by Theophrastus (*ca.* 370-*ca.* 286 B.C.), Aristotle's pupil and later his successor as head of the Lyceum. In both his *History of Plants* and *Causes of Plants* he frequently referred to squill as if it were a common plant. It belonged to the class of bulbous plants and possessed a large bulb with several layers of scales capable of being peeled off.<sup>48</sup> Elsewhere Theophrastus describes the tunicate bulb in terms which will reappear in later writings:

Now all bulbous plants are tenacious of life, but especially squill; for this even lives when hung up and continues to do so for a very long time; it is even able to keep other things that are stored, for instance the pomegranate, if the stalk of the fruit is set in it; and some cuttings strike more quickly if set in it; and it is said that, if planted before the entrance door of a house, it wards off mischief which threatens it.<sup>49</sup>

Regarding its habitat, he noted that there are some terrestrial plants which, "on occasion live in the sea" (*ποτέ ἐν τῇ θαλάττῃ βιοῦν*) such as palm, squill, and asphodel.<sup>50</sup> The obvious translation suggests that Theophrastus was attempting to describe a strand plant. But if he was describing a locale where the plant was washed by wave action or submerged at high tide, no corroborating evidence has been found. It is rather more likely that this was a loose phrase, indicating nothing more than a maritime habitat, reflected in some of the many vernacular names proposed for squill.<sup>51</sup>

There is one more Theophrastean reference to squill which deserves comment. In his *Characters*, a series of life-like characterizations combined with embellished stereotypes, the description of the superstitious man concludes thus:

if ever he see one of the figures of Hecate at the crossroads wreathed with garlic, he is off home to wash his head and summon priestesses whom he bids purify him with the carrying around of a squill or a puppy-dog.<sup>52</sup>

After Theophrastus, evidence for the knowledge and uses, medicinal as well as nonmedicinal, becomes more frequent. Each of the strands of the interwoven history of squill touched an above-medical,



pharmacological, botanical, and magical—receives its share of attention.

Caelius Aurelianus, a fifth century physician of the methodist sect, stated in his long account of dropsy that Erasistratus (early third century B.C.) and Asclepiades (*d. ca.* 40 B.C.) had each written *De hydropse* (On Dropsy).<sup>53</sup> Unfortunately these books have been lost and with that loss, perhaps went information regarding the early post-Hippocratic use of squill.<sup>54</sup> It is, in fact, not until the early first century A.D. that a pattern begins to emerge regarding the therapeutic uses of squill. Prior to that time the few references are of an incidental nature and play little role in subsequent times.

It is otherwise, however, with the report of Aulus Cornelius Celsus, Roman encyclopedist and author of *De Medicina*, who flourished under the Emperor Tiberius (14-37 A.D.). Whether he was an original writer or only the editor-translator of a now lost Greek text is of less moment than his clear and straightforward description of dropsy and its treatment.<sup>55</sup> Following a tradition that extends back to Hippocrates, he recognized the value of a closely regulated regimen and a rigorous control of fluids, even to the extent of recording daily intake and output.<sup>56</sup> Diuretics, he admitted, are beneficial but diuresis, he thought, was better effected by diet and regimen than by drugs. Nevertheless, he enumerated some 25 diuretics, most of which will occur, for centuries to come, in treatment for dropsy.<sup>57</sup> Toward the end of his account of dropsy he added, almost as an afterthought, "It is also useful to suck a boiled squill."<sup>58</sup> Elsewhere in *De Medicina* other uses of squill are mentioned, including squill vinegar, which later played an important role in materia medica generally.<sup>59</sup> Celsus' references to *acetum scillinum* are particularly interesting because he does not include a recipe for its preparation. Presumably he assumed that his readers knew how to prepare squill vinegar though, in fact, no recipe earlier than those of Dioscorides and Pliny seems to have been preserved.

With the mention of Dioscorides and Pliny it is only fitting to consider their contributions at this point. Along with Galen, Dioscorides (*fl. ca.* 50 A.D.) and Pliny (23-79 A.D.) were the most influential of ancient writers on materia medica, though for somewhat different reasons. Whereas Dioscorides' *De materia medica* was one of the greatest texts ever written on the subject, whose very name derived from his only publication, Pliny was essentially a com-

piller, and not always too critical at that. But because Pliny wrote in Latin, his encyclopedic *Historia naturalis* was widely read, copied, abridged, and excerpted throughout western Christendom.<sup>60</sup> Dioscorides' *De materia medica*, on the other hand, maintained a precarious existence in the West until the late Middle Ages.<sup>61</sup> In the Byzantine East, on the other hand, it remained the fundamental text for the later physician-compilers.

The relation between Dioscorides and Pliny—neither of whom mentions the other by name—is still a matter of controversy.<sup>62</sup> Whatever the ultimate answer regarding that relation may be, their respective statements on squill provide the most detailed reports in antiquity and supplied generations of later writers with data to be abridged or otherwise modified as occasion dictated. Because of its historical importance I translate, in its entirety, Dioscorides' chapter on squill.

Squill has a sharp, heating property, but when cooked it is very useful. Wrapped around with clay or spelt-dough, it is placed in an earthenware pot or in the ashes until the outer covering of dough is sufficiently baked. If it is not tender following removal of the covering, we apply another covering of dough or clay [and cook again]; for, if the squill is not sufficiently cooked, it is harmful when given, especially to the intestines if taken internally. It is also prepared by cooking in a jar, covered with a lid, placed inside an earthenware pot. In this process, the middle portion is used, the outside having been stripped off. After being cut in pieces, it is boiled. The water of the first boiling is poured off, and it is boiled again until the water is neither bitter nor sharp. Then it is cut into [smaller] pieces, strung on a thread so that the pieces do not touch one another, and dried in the shade. Those pieces we use as wine, vinegar, or oil of squills. For fissures of the feet, the inner portion of raw squill is boiled with oil or applied, mixed with pitch; and as a cataplasm, boiled with vinegar, for those bitten by a viper. For purposes of softening the belly, we give to a fasting patient one or two spoonfuls of [a preparation composed of] one part of roasted squill to eight parts of roasted, pulverized salt. It is given in drinks or in aromatic preparations when we wish to promote the flow of urine, to those with dropsy, or whose stomach is bloated with undigested food, or

to those suffering from jaundice, colic, chronic cough, asthma, and to those who bring up phlegm. A lozenge of three obol's weight, mixed with honey, is sufficient. Boiled down or eaten with honey, it especially aids digestion and also removes glutinous matter from the stomach. Prepared and administered in the above manner [it is effective] for such complaints; nevertheless, one should guard against giving it to a patient who suffers from internal ulceration. Roasted squill, when anointed, is effective against warts and chilblains. Its seed, crushed and eaten with a dried fig or honey, softens the belly. Also it is an *alexipharmacum* when hung up whole in front of doors.<sup>63</sup>

No comment is required beyond noting that nothing was said concerning the botanical description or habitat of squill. It may be assumed, judging from Dioscorides' careful descriptions elsewhere, that he considered squill sufficiently common and, to borrow his phrase, γνώριμος πᾶσιν (known to all), that no description was required.<sup>64</sup>

Pliny's several accounts complement those of Dioscorides. In addition to several miscellaneous references,<sup>65</sup> deriving from Theophrastus and perhaps others, there are two passages which deserve notice. For, along with the passage from Dioscorides and the references to squill by Scribonius Largus<sup>66</sup> and Galen, Pliny's account formed the basis of *scillologia* for the next millennium and a half.

"The most famous bulb," he states,

is the squill, although it naturally serves as a drug and is used for increasing the sourness of vinegar; and no other bulb is of larger size, just as also no other has a more powerful pungency. There are two kinds used for medicine, the male squill with white leaves and the female squill with dark leaves; and there is also a third kind, agreeable as an article of diet, called Epimenides' squill—this has a narrower leaf with a less pungent taste. All produce a very large quantity of seed, though they come up more quickly if grown from the bulbs that shoot out round their sides; and to make them grow bigger, the leaves, which in this plant are of a large size, are bent down in a circle round them and covered with soil, so causing the heads to draw all the juice into themselves. They grow wild in very large quantities in the Balearic Islands and Iviza, and throughout the Spanish provinces. The philosopher Pythagoras wrote

a whole book about them, including an account of their medicinal properties, which we shall record in the next volume.<sup>67</sup>

Keeping to his promise, Pliny next turns to the medicinal uses of squill. "The squill used in medicine," he begins, "is white (the dark squill is female), and the whiter it is, the more beneficial."<sup>68</sup> The long passage which follows is, in all essentials, so similar to Dioscorides' account, that nothing would be gained by reproducing it here. Noteworthy, however, is one passage concerning squill vinegar. "So great is its strength," Pliny states, "that too copious a draught produces for a moment the appearance of death."<sup>69</sup> Whether this is his own contribution or whether he derived it from an unnamed source cannot be determined, but no parallel to this has been found in his predecessors.

Subsequent writers drew heavily upon the accounts of Dioscorides and Pliny for the medicinal uses of squill. Thus, the author of the versified *Liber medicinalis*, commonly attributed to Quintus Serenus (who died before 235 A.D.), mentions a vinous preparation of squills (*scillinus . . . Bacchus*) along with other drugs in his account of the treatment of dropsy.<sup>70</sup> Because of Quintus' affected style, it is not easy to specify his source, although on other grounds it is known that he relied heavily on Pliny, just as Benedictus Crispus (*d. ca. 725*) later relied on Quintus.<sup>71</sup>

It is likewise not easy to determine the sources of Rufus of Ephesus<sup>72</sup> (*fl. ca. 98-117*) and Aretaeus<sup>73</sup> (*fl. ca. 150-200*), both of whom mention squill but, significantly, not in connection with dropsy.

Even Galen (129?-199), for all his creativeness, did little more when listing the simples in alphabetical order than paraphrase Dioscorides' account.<sup>74</sup> His description of squill is so compressed that, were it not for other passages in which he mentions squill, it might be assumed that it was a mere literary borrowing of the type that becomes more frequent with the passage of time. By omitting all descriptive characteristics of the plant, Galen established a precedent for the Byzantine epigones Aetius of Amida<sup>75</sup> (*fl. 527-565*) and Paul of Aegina<sup>76</sup> (625-690), who repeated his account. Other Galenic references indicate, if not personal experience of the plant itself, that squill was a favorite ingredient in a wide variety of composita.<sup>77</sup> Naturally, this included the famous theriac, an antidote whose composition was no less wonderful than its reputed benefits.<sup>78</sup>

The wide range of uses to which squill was put by Galen had an important bearing on the future. Writers as diverse as Pseudo-Apuleius, the unknown author of the well-known *Herbarius*, Marcellus of Bordeaux<sup>79</sup> (fl. 390-410), Cassius Felix<sup>80</sup> (fl. 447), Caelius Aurelianus,<sup>81</sup> and Alexander of Tralles<sup>82</sup> (525-605) included squill in their armamentaria. Pseudo-Apuleius listed nine synonyms in the chapter *Herba scilla* and concluded with the statement that it may be collected at any time of the year.<sup>83</sup> Whether the anonymous writer actually had any personal experience with or knowledge of squill may be doubted.<sup>84</sup> But by emphasizing its usefulness for dropsy, he helped to maintain a long but not uninterrupted tradition.<sup>85</sup>

As Greco-Roman civilization declined, irrational beliefs and practices gradually but perceptibly replaced the rational and naturalistic bases of the medical arts. This change is manifest in as many different forms as there have been attempts to explain it. Without attempting yet another explanation, a few passages pertaining to squill will illustrate some of the changes which took place in the last centuries of the ancient world. They will, moreover, provide a reference point for our examination of the role of squill in medieval materia medica.

As early as the second century, the darker aspects of squill lore, hinted at by Dioscorides' last sentence, become evident. Magical properties, for example, were attributed to squill by Aelian (ca. 170-225) who stated: "If a lion put his paw upon the leaves of an ilex, he goes numb. [And the same thing happens to] a wolf, should he ever come near the leaves of a squill."<sup>86</sup> A similar bit of lycophobia is reported by Artemidorus of Daldis (late second century) in the *Onirocriticon*<sup>87</sup> (*On the Interpretation of Dreams*) and other fancies are reported in the *Geoponica*.<sup>88</sup> In the *Mulomedicina Chironis*, a collection of veterinary precepts compiled no earlier than mid-fourth century, squill is listed as one of the ingredients in a vinous preparation. Among its many uses, it served both prognostic and preventive needs by indicating whether a mare was pregnant but also by preventing pregnancy.<sup>89</sup> It might also be noted that squill was included in a complex, calefacient mixture recommended for beasts of burden suffering from *cardiacus*.<sup>90</sup>

Because of the survival of Greco-Roman medicine in the early Middle Ages, it is futile to attempt to stipulate precisely the date at which medieval materia medica began. One can, however, isolate cer-

tain characteristics, typical of the postclassical period and, on that basis, compare and contrast the theory and practice of ancient and medieval materia medica.

As a rough approximation, it may be said that medieval materia medica took shape in the period represented by Marcellus of Bordeaux and Benedictus Crispus of Milan. Among the best evidence for this claim are the antidotaria and receptaria of the ninth and 10th centuries, which clearly presuppose several centuries of development (see below).

Rather than define early medieval materia medica in absolute terms, attention is called, in the following pages, to two points.

First, many of the plants of a circum-Mediterranean origin which were known to the Greeks and Romans were not found in Western or trans-alpine Europe. Some of these plants, to be certain, were introduced by Roman colonists and have since become thoroughly naturalized, much to the discomfiture of taxonomists seeking to distinguish indigenes from natives. It is thus obvious that later references to eastern exotica—for example, cloves, cinnamon, nutmeg, and the many aromatic vegetable gums—were based either on experience with the dried products available from the apothecary or on passages in earlier writings.<sup>91</sup> This situation holds true for squill as for many of the exotica because of its habitational preferences and climatic requirements.<sup>92</sup> If squill were known to early medieval writers other than those of southern Europe, it was probably in the dried form or as squill vinegar (the latter being prepared locally, provided the dried slices were available). Because squill is highly hygroscopic, it would not withstand shipping and long storage as well as the dried bark, seeds, or gums of other exotica. Consequently, one cannot be certain that squill was available in northern or western Europe until the late Middle Ages, despite a puzzling reference in a document of the 10th century.<sup>93</sup> From the 14th century onward, however, there is good evidence that stocks of squill were maintained by some apothecaries.<sup>94</sup>

The second point follows directly from the first: the lack of personal knowledge of squill accounts for its absence in many medical texts written in northern or western Europe. *Mutatis mutandis*, its inclusion in a medieval medical text of western or northern European provenance does not necessarily indicate personal knowledge. Under these circumstances, contemporary glossaries and lexica are of especial

importance. By providing synonyms plus some miscellaneous data regarding a plant unknown to the majority of their compilers, such texts are as revealing as they are typical of medieval medical botany.<sup>95</sup> A reference to squill in medieval medical texts may thus mean no more than that the compiler of such a text found a passage or recipe containing squill to be of sufficient interest or importance to warrant inclusion.<sup>96</sup>

With this by way of introduction, it is time to turn to some of the innumerable references to squill. A good starting point is afforded by the *antidotaria* and *receptaria* mentioned above.

Historically, these prototypes of the later pharmacopoeias and formularies developed from collections of recipes and preceded the more systematized leechbooks and herbals. Because of their practical yet circumscribed nature, descriptions and other kinds of botanical data are only incidentally included. The one exception, a preoccupation with synonyms, is, as we have seen, no guarantee that the compiler had any personal knowledge of the plants denoted. The most frequent mention of squill is in connection with recipes of which it forms an ingredient: for example, in the preparation of squill troches (*trocisci scillitici*).<sup>97</sup> Equally frequent is the inclusion of squill vinegar in a recipe for a compositum.<sup>98</sup> Other information pertaining to squill includes the specification of its grade and complexion<sup>99</sup> and a recital of its virtues,<sup>100</sup> along with its poorly understood poisonous properties.<sup>101</sup>

In these, as in other passages in medieval recipe collections, it is not always stated that squill is useful as a diuretic or hydragogue. Often, in fact, squill is included in lists of simples characterized by some other physiological action.<sup>102</sup> Likewise, recipes for the treatment of dropsy often do not include squill, even though it is mentioned elsewhere in the same text for different purposes.<sup>103</sup> A particularly good example is the *Antidotarium Bruxellense*, of perhaps the 12th century. It contains seven consecutive sections, each of which is entitled *Ad hydropem*.<sup>104</sup> Of the many simples of animal and vegetable origin listed in those sections, only two contain squill as an ingredient.<sup>105</sup>

Recipes and directions for the preparation of composita containing squill naturally suggest a practical application. Leechbooks and other genres of medical writings such as surgical<sup>106</sup> and dietetic texts and

consilia<sup>107</sup> provide additional information regarding the use of squill. The two most significant facts in such writings are the many different uses of squill and the large number of remedies for dropsy which do not contain squill.

As regards the former point, squill, in one form or another, is most often recommended as a purge or emetic.<sup>108</sup> In the form of a plaster, squill was used for a variety of complaints, especially those pertaining to the spleen.<sup>109</sup> Oddly, its use as a diuretic is not common and even the famous *Regimen sanitatis salernitanum* lists squill as a lithontriptic, despite a section entitled *Diuretica*, immediately preceding, which contained 16 simples.<sup>110</sup> The rationale for the employment of squill is lacking, unfortunately, in a prescription for fertility pills, recommended for the Margraf of Brandenburg about 1440.<sup>111</sup>

Few of the passages in leechbooks which mention squill indicate any personal experience with the plant itself. One possible exception is a reference to "white squill" (*squille bianche*) as one of the ingredients in "Agrippa's Unguent" (*Unguento Agrippa*).<sup>112</sup> Underlying this phrase may be the recognition of the two color varieties mentioned above.

Two other passages shed some further light on the physician's knowledge of squill. In Lanfranchi's discussion of the preparation of drugs by cooking or burning it is stated that heating increases their virtue. As an example, squill is mentioned.<sup>113</sup> Since Lanfranchi (*d. ca.* 1306) was active in Italy and southern France before proceeding to Paris, he had an opportunity for personal experience with squill, unlike many of his northern colleagues. The passage from Lanfranchi is significant for a second reason. In the low German *Jonghe Lanfranc* (*ca.* 1450), squill is conspicuously omitted from the list of simples.<sup>114</sup>

A second reference is interesting for a slightly different reason. While the passage in question does not indicate a personal knowledge of squill on the part of the wound surgeon it explicitly states that whole squills were available from the apothecary.<sup>115</sup>

No account of medieval medicine would be complete without a brief mention of the encyclopedists and their role in the transmission of information, both correct and incorrect. Beginning with the *Etymologiae* of Isidore of Seville (*ca.* 560-636), the later compilations of Bartholomew the Englishman (*fl. ca.* 1220-1240), Vincent of Beauvais (*d. ca.* 1264), and Konrad of Megenberg (1309-1374), each in-



cluded a chapter on squill. Because the content of those chapters derived for the most part from writings already examined above, there is no need to translate them in full. Though they added little new material to the historical record they are not, on that account, unimportant. They represent the kind of information available to and used by laymen until superseded by the herbals of the late 15th century, which initiated new directions in medical botany.

Isidore's account, a model of succinctness, is so compressed that it may be wondered what could be gained from it. "*Scilla*," he stated, "is harmful. According to popular superstition, it is said that if hung over the door entire, all evils disappear."<sup>116</sup>

The chapter from Bartholomew's *On the Properties of Things* is of interest to us chiefly because it exemplifies a deep-seated confusion between several bulbous plants and their various names and synonyms. Book Seventeen, an alphabetical enumeration of 194 plants, does not contain a chapter on squill. However, the chapter entitled *De cepe* (On the Onion) begins thus: "Dog onion (*cepe caninum*) is called squill and it is found near the sea. Whence, according to Platearius, it is called 'sea onion' (*cepa marina*)."<sup>117</sup> The remainder of Bartholomew's account need not detain us for the simple reason that it is almost a verbatim copy of Pliny's discussion of the onion or *cepa* (*Allium Cepa* L.). Since neither *cepe caninum* nor *cepa marina* occur in Pliny, it seems safe to conclude that Bartholomew used other sources, despite the explicit reference to *Historia Naturalis XX*, chapter xvii. It is even open to question whether the *Circa Instans* of Matthaeus Platearius (*d. ca. 1160*) was Bartholomew's source since *cepe caninum* and *cepa marina* do not appear in the edition available to us.<sup>118</sup>

The second of the 13th century encyclopedias, the *Speculum Naturale* of Vincent of Beauvais, contains a much longer account of squill than that of his slightly older contemporary, Bartholomew. Entitled *De squilla*, it begins by repeating Isidore's account.<sup>119</sup> Then follows a section taken verbatim from Pliny, which is succeeded by four more sections derived from as many sources: Dioscorides, Avicenna, Platearius, and Constantinus (Constantine the African). Because Vincent adhered closely to his sources, his account contributes nothing new. But by assembling the major sources into one book, he gained for himself a place in later centuries as the author of one of the most popular of medieval reference works.

The last of the three medieval encyclopedias to be examined presents a somewhat different picture. *The Book of Nature* of Konrad of Megenberg was a reorganized, vernacular translation of *De natura rerum* of Thomas of Cantimpré (ca. 1186/1210-ca. 1271/1280) which still remains unedited. Book Five, one of two books devoted to plants, contains an account of squill, entitled *Von dem Mauszwival* (*On the Mouse-Onion*). "Squilla is called mouse-onion," he begins,

because that plant kills mice. Its leaves are shaped like those of the lily. One kind of the plant is deadly poisonous and some believe it to be aconite. But that is not true<sup>120</sup> and accordingly it is false to write *cepa maris*, that is, sea-onion, in place of *cepa muris*, that is, mouse-onion, which I have accordingly written above. There is another kind which is harmless and of a pleasant odor. It is hot and dry, which explains its odor when eaten and which produces the sharp taste in the mouth. It is good for dropsy and jaundice, it promotes the flow of urine and the menses, and causes abortion in pregnant women, thereby delivering them of their child before their time. A magician said that whoever hangs the plant over the door of his house will prevent poisonous animals from entering.<sup>121</sup>

The passages cited above, plus innumerable others in similar writings, are characteristic of much of medieval materia medica. In the extensive literature devoted to simples, emphasis was placed on recording their therapeutic virtues and, secondarily, on lexicographical matters. But in the process, descriptions of the simples themselves were ignored or, if present, were repetitions or adaptation of earlier writings.

The herbal slowly took shape in an effort to correct that situation. It supplied a need by providing, in theory at least, short descriptions of simples, usually in alphabetical order for rapid consultation, so that they could be recognized, and hence collected, with a minimum of training required. Because of its practical, medical purpose the herbal naturally included the therapeutic virtues of the simples, the diseases or complaints for which they were beneficial and, as always, a selection of synonyms to facilitate communication among the various users.

Despite its adherence to older writings, the herbal, in form and content alike, represented a union of science and medicine, though this was not realized until the mid-16th century. The earlier herbals, by and large, did not provide fuller or more reliable information than

that found in other genres of medical literature. In fact, they tended to be as tradition-bound as the recipe collections and leechbooks from which many of their data originally derived. In short, the compilers of pre-16th century herbals relied mainly on classical sources for their descriptions of the simples rather than on nature itself.

Because of the high incidence of repetition, there is no need to repeat again the well-worn statements regarding squill. Instead, we conclude by summarizing the kind of medicobotanical information available to and commonly accepted by the herbalists on the eve of the 16th century.

Bearing in mind the fact that many of the late medieval herbals were written in areas in which squill was not native, the omission of a chapter devoted specifically to it can readily be understood. By the same token, a chapter on squill in a herbal known to have been written or compiled in such an area indicates reliance upon an earlier source which has been paraphrased or translated. The claims made about squill in writings of the last class thus do not rest on a personal knowledge of the living plant.

Given such a background, information regarding squill falls into the following well-defined categories of medieval herbals. Both Latin and vernacular names and synonyms are commonly reported<sup>122</sup> and, on occasion, an etymology is offered.<sup>123</sup> Descriptions of the plant, however, are less frequently attempted<sup>124</sup> and some of the few descriptive data concerning squill can be traced to earlier writings.<sup>125</sup> The few references to its habitat may derive from personal knowledge,<sup>126</sup> but they may also be inferences drawn from its vernacular name.<sup>127</sup>

An enumeration of the virtues of a simple, in this case squill,<sup>128</sup> is an invariable component of a herbal as are the diseases and complaints for which it was beneficial.<sup>129</sup> The latter list is not constant, and unusual variations may represent the intrusion of folk medicine.<sup>130</sup> The grade and complexion of squill are frequently reported.<sup>131</sup> Its diuretic properties are emphasized,<sup>132</sup> as is its consequent employment for dropsy.<sup>133</sup> Squill continued to be regarded as poisonous by many authors,<sup>134</sup> yet reference to its pesticidal action is not accompanied by directions for preparation or dosage.<sup>135</sup> Despite its reputed toxicity, squill is occasionally mentioned as an alimentary article.<sup>136</sup> Perhaps the most novel feature of the late medieval printed herbals is a toler-

ably recognizable woodcut illustration of the plant.<sup>137</sup> Finally, in keeping with a time in which the boundaries between science and superstition were vague, squill enjoyed an undiminished reputation as an alexipharmacum,<sup>138</sup> a use which, until recently, it still enjoyed.<sup>139</sup>

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#### NOTES AND REFERENCES

- In addition to the studies cited in the following notes, see Steier, H., *Σκίλλα*, Pauly-Wissowa: *Realencyclopädie der classischen Altertumswissenschaft*. Stuttgart, 1927, vol. 3 A/1, cols. 522-26; Schroff, C.: Beitrag zur näheren Kenntniss der Meerzwiebel. *Z. Allg. Österr. Apothver.* 3:9-17, 38-43, 57-63, 85-93, 1865; and Müller, R.: *Beiträge zur Geschichte der officinellen Drogen. Bulbus scillae, Herba absinthii und cinnae*. Basel, Colmar, 1931 (must be used cautiously!).
- Boisacq, E.: *Dictionnaire Etymologique de la Langue Grecque*, 3d ed. Heidelberg and Paris, 1938, p. 876 (does not propose an etymology and merely notes an Old Irish parallel); Strömberg, R.: Griechische Pflanzennamen, *Göteborgs Högsk. Årssk.* 46:15, 1940 (lists *σκίλλα* among other plant names which "scheinen unmöglich zu erklären"). The attempt to derive *σκίλλα* from *σκόλλω*, reported to have been adopted by Withering (Sharp, G.: Squill studied historically. *Pharm. Journ.* 84:136, 1910) has not met with approval; cf. Carnoy, A.-J.: Notes d'Etymologie Grecque. *Rev. Etudes Grecques* 69:288, 1956. The last word thus seems to be that of H. Frisk (*Griechisches Etymologisches Wörterbuch*. Fasc. 18. Heidelberg, 1960, p. 731), who states that *σκίλλα* is a *Unerk-*
- lärtes Fremdwort. Cf. reference 25.
- Claims for an Egyptian squill-cult (e.g., Hirschfeld, F.: Studien zur Geschichte der Heilpflanzen. II. Scilla. *Kyklos* 2:163-79, 1929) and its high antiquity among the ancient Egyptians (Woenig, F.: *Die Pflanzen im alten Aegypten*. Leipzig, Friedrich, 1886, p. 395) are not substantiated by paleobotanical evidence. Plant remains once thought to be those of squill have since been re-identified as *Scilla pusilla* Migl. by Loret, V.: *La Flore Pharaonique*. Paris, Leroux, 1892, pp. 38-39. Pseudo-Apuleius lists two Egyptian synonyms for squill (see below) but they are obviously the result of Hellenization; cf. André, J.: *Notes de Lexicographie Botanique Grecque*. Paris, 1958, p. 47, s.v. *ὄφθαλμὸς Τυφῶνος*. Moreover, the attempt by Hirschfeld, op. cit., p. 163, and Oliaro, T.: La scilla nella leggenda e nella storia della medicina. *Arch. Sci. Med.* 60:778, 1935, to relate Typho's hiding place in Egypt (Herodotus, *Historia III*, Stein, H., editor, 3 vols., 5th ed. Berlin, 1893-1901, vol. 3, p. 8) to squill depend upon the late etymological identification of squill with some vernacular name such as "the eye of Typho" (*ὄφθαλμὸς Τυφῶνος*).
- An early, perhaps ritual, representation of squill is noted and reproduced by Marinatos, S.: La marine créto-

- mycénienne. *Bull. Correspond. Hell.* 57:223-24, 1933, Figures 56 and 57 (Plates 16 and 17).
5. Polunin, O. and Huxley, A.: *Flowers of the Mediterranean*. London, Chatto and Windus, 1967, p. 214. A line drawing occurs on Plate 23, Figure 429. A series of five drawings, three from 16th century herbals, is reproduced by Font Quer, P.: *Plantas Medicinales*. Barcelona, Editorial Labor, 1962, pp. 895-98.
  6. Graf, A. B.: *Exotic Plant Manual*. East Rutherford, N. J., Roehrs, 1970, p. 718.
  7. See Winton, F. R.: A contrast between the actions of red and white squills. *J. Pharm. Exp. Therap.* 31: 137-44, 1927. For a review of the older literature in which the taxonomic problem was uppermost, see Schroff, C.: *Scilla maritima L., Urginea Scilla Steinh.* *Z. Ges. Ärzte Wien* 20:390-93, 1864.
  8. This property may explain some of the magical uses to which squill was put, including, perhaps, as a fertility symbol. "The Greeks hang the bulbs up in their houses during the New Year as a fertility rite." Polunin and Huxley, op. cit., p. 214. Cf. reference 139.
  9. Baker, J. G.: Revision of the genera and species of Scilleae and Chlorogaleae. *J. Linnean Soc. London, Botany* 13:209-92, 1872.
  10. Steinheil, A.: Note sur le genre *Urginea* nouvellement formé dans la famille des Liliacées. *Ann. Sci. Nat.* 1:321-32, 1834, 2 figures; Steinheil, A.: Quelques observations relatives aux genres *Scilla* et *Urginea*. *Ann. Sci. Nat.* 6:272-86, 1836.
  11. Linnaeus, C.: *Species Plantarum*. Stockholm, 1753, p. 308. Facsimile reprint. London, Ray Society, 1957.
  12. For a synopsis of the older names, cf. de Wildeman, E.: *Notes pour l'histoire de la botanique et de l'horticulture en Belgique*. Bruxelles, Palais des Académies, 1950, p. 529.
  13. Theognis, verse 537. In: Bergk, T., editor: *Poetae Lyrici Graeci*, 3d ed., 3 vols. Leipzig, Teubner, 1866-1867, vol. 2, p. 421.
  14. Hipponax, fr. 7. In: Diehl, E., editor: *Anthologia Lyrica Graeca*. Fasc. 3, *Iamborum Scriptores*. Leipzig, Teubner, 1954, p. 83. The term *σκίλλησις* is unambiguous, yet Jane Harrison in a long and valuable section on the *pharmakos* or scapegoat consistently translates it as "leeks" in *Prolegomena to the Study of Greek Religion*, 3d ed. New York, Meridian, 1955, pp. 95-106, possibly influenced by a passage in Aristophanes (*Frogs* 621) where leeks (*πράσῳ*) are used for similar ritual purposes.
  15. For the paleographically acceptable emendation *λειμῶνι*, see Diehl, ad loc., who notes other attempts to "save the phenomena." Harrison, op. cit., p. 98, prefers "in the meadow" but offers no reason.
  16. Bailey, L. H.: *The Standard Cyclopaedia of Horticulture*. New York, Macmillan, 1941, vol. 3, p. 3416. *Urginea* is classed as a geophyte, a plant whose leaves appear after flowering, by Zohary, M.: *Plant Life of Palestine, Israel and Jordan*. New York, Ronald, 1962, p. 193.
  17. For the combination of figs and squills, see reference 19. That this was a ritual whipping is clear from Hipponax, fr. 11. In: Diehl, op. cit., p. 84, where it is stated that the *pharmakos* was "beaten seven times" (*ἑπτὰκις*). Cf. Theocritus, *Idyll VII*, 107, where a flogging with squills is described. Ameis, C. F., editor: *Theocritus*. Paris, Didot, 1862, p. 17.
  18. Flückiger, F. and Hanbury, D.: *Pharmacographia*. London, Macmillan, 1874, p. 629; Wood, H. C., Wood, G. B., and Bache, F.: *The Dispensatory of the United States of America*, Centennial ed. Philadelphia, Lippincott, 1937, p. 963.
  19. "... an incurable itching . . . such as comes upon those whose skin is defiled with the snow-white juice of the fig-tree or by the stinging nettle or by the many-coated head of the squill, which fearfully inflames the flesh of

- children." Nicander: *Alexipharmaca*, vv. 250-54, Gow, A. S. F. and Scholfield, A. F., translators. *Nicander, The Poems and Poetical Fragments*. Cambridge, Cambridge University Press, 1953, p. 111. See references 59 and 66.
20. Athenaeus: *The Deipnosophists* II, 70-71, 7 vols., Gulick, C. B., translator. London, Heinmann, Loeb Classical Library, 1951-1957, vol. 1, p. 309.
  21. Certain African tribes roast the leaves and stalks of an unidentified species of *Urginea*, and "cook them as a spinach." Sturtevant, E. L.: *Notes on Edible Plants*, Hedrick, U. P., editor. Albany, Lyons, 1919, p. 584. That squill was eaten can be inferred from a passage in the Pseudo-Dioscoridean *De herbis femininis*, cap. 43: *sed ultra septenis comedi non oportet, ne nervos vexet*; Kästner, H. F.: *Pseudo-Dioscoridis de herbis femininis*. *Hermes* 31:619, 1896.
  22. Athenaeus: *Deipnosophists* II, 68, ed. cit., vol. 1, p. 297.
  23. Dioscorides: *De materia medica* I, 70, Wellmann, M., editor, 3 vols. Berlin, Weidmann, 1906-1914, vol. 1, pp. 66-67. In general, see Koch, K.: *Die Bäume und Sträucher des alten Griechenlands*. Berlin, Jacobsthal, 1884, pp. 265-67; and Seidensticker, A.: *Waldgeschichte des Alterthums*, 2 vols. Frankfurt, Trowitzsch., 1886, vol. 2, p. 79.
  24. See the references in Lenz, H.: *Botanik der alten Griechen und Römer*. Gotha, Thienemann, 1859, pp. 660-61.
  25. [Galen]: *Dictionum explicatio*, Kühn, C. G., editor. *Galen Opera Omnia*, XIX. Leipzig, Cnobloch, 1830, p. 145, s.v. *σχίνον*. As an example of the nomenclatural confusion cf. the three entries by Hesychius: *σχίνος. καὶ ἡ σκίλλα. καὶ εἶδος φυτοῦ* (col. 1427); *σκίλλα. σκαμμωνία, θανατηφόρος μῦθων* (col. 1364); *σκελετά σκίλλα* (col. 1361), Hesychius of Alexandria; *Lexicon*, Schmidt, M., editor. Jena, Dufft, 1867. The last of the three Hesychian glosses is cited by Carnoy, A.-J.: *Dictionnaire Etymologique des Noms Grecs de Plantes*. Louvain, Université de Louvain, 1959, p. 237 as providing evidence for the etymology of *σκίλλα*. Cf. reference 34.
  26. Cratinus, fr. 71. In: *Comicorum Atticorum Fragmenta*, 2 vols., Kock, T., editor. Leipzig, Teubner, 1880-1884, vol. 1, p. 35 (from Plutarch: *Life of Pericles*, 13).
  27. Cf. Kock, T., ed. cit., p. 35 adn.
  28. This passage from Aristophanes occurs as testimonium 421 in Edelstein, E. J. and Edelstein, L.: *Asclepius*, 2 vols. Baltimore, Johns Hopkins Press, 1945, vol. 1, pp. 213-20.
  29. Edelstein, op. cit., p. 219. The identification of *σχίνος* as squill is maintained by Friedrich Kanngiesser, "Medizinische und botanische Erläuterungen zu Aristophanes." *Jen. Z. Natur.* 50:851, 1913.
  30. Diogenes Laertius: *Lives of Eminent Philosophers*, I, 112, Hicks, R. D., editor. London, Heinmann, Loeb Classical Library, 1950, vol. 1, p. 117 (translation revised). The same passage occurs as fragmentum A 1 in Diels, H.: *Die Fragmente der Vorsokratiker* 5. Berlin, Weidmann, 1934, vol. 1, p. 28.
  31. Theophrastus: *Historia Plantarum*, VII, xii, 1. Translated, as *Enquiry into Plants*, 2 vols., by Hort, H. London, Heinmann, Loeb Classical Library, 1916, vol. 2, p. 125 (= Epimenides fr. A6, Diels-Kranz, ed. cit.) Epimenides' squill has been identified as *Ornithogalum pyrenaicum* L. by Fraas, C.: *Synopsis Plantarum Florae Classicae*. Berlin, Calvary, 1870, p. 289.
  32. Epimenides is termed a *magus*, along with Pythagoras and Orpheus, by Apuleius, *Apologia* 27 (= Epimenides fr. A 6a, Diels-Kranz, ed. cit.). A magical use of squill was mentioned by the poet Diphilus and preserved by Clement of Alexandria in ridicule of pagan soothsayers, Diphilus fr. 126 (Kock, ed. cit., vol. 2, pp. 577-78). Magical purifications with "torch and squill" are satirized by Lucian: *Menippus* 7, *Opera*, Jacobitz, K., editor, 3 vols. Leipzig, Teubner, 1909, vol. 1, p. 195.
  33. See Stannard, J.: Lost botanical writings of antiquity. *Actes du XIe Con-*

- grès International d'Histoire des Sciences, Varsovie-Cracovie, 24-31 Août 1965.* (Varsovie) 5:319-22, 1968.
34. I, 81 in Hippocrates: *Oeuvres Complètes*, Littré, E., editor, 10 vols. Paris, Baillière, 1839-1861, vol. 8, p. 202; 1, 105 (VIII, 228 L.), 2, 134 (VIII, 304); 2, 135 (VIII, 306); 2, 172 (VIII, 354); 2, 206 (VIII, 398, 400). In *Diseases of Women* 2, 201 (VIII, 384) a remedy for "uterine suffocation" contains, as a principal ingredient, *σχίνον τριπητήν*. If *σχίνον* means "squill," as Littré translates, then pounded or shredded squill should be added to the above list.
  35. 8 (VIII, 332 L.); 32 (VII, 364 L.); 107 (VII, 422 L.); 109 (VII, 428 L.).
  36. *Regimen in Acute Diseases, Appendix*, 30 (II, 518 L.); *On Sores*, 21 (VI, 424 L.); 22 (VI, 426 L.); 23 (VI, 428 L.); *On Superfetation*, 32 (VIII, 500 L.).
  37. Sliced squill, cooked with honey, cumin, sesame, and almonds, is recommended as an eclegma for those suffering from *empyema* (τοῖσι ἐμπύοισι), *Regimen in Acute Diseases, Appendix*, 30 (II, 518 L.). *Empyema* here seems to be distinguished from dropsy because chapter 26 (II, 512 L.) contains a recipe for a "dropsical drink" (πόμα ὑδρωπιωντι).
  38. *Nature of Woman*, 8, 32, 107, 109; *Diseases of Women*, I, 81; II, 134, 135, 172, 206; *On Superfetation*, 32.
  39. *On Sores*, 21 (VI, 424 L.), 22 (VI, 426 L.), 23 (VI, 429 L.).
  40. *Diseases of Women*, 1, 105 (VIII, 228 L.). In addition to its use in dropsy (*hydropicos per urinam desiccata*), squill juice in *oculos infusum, aciem tergit*. *Dynamidia*, II, 97, Mai, A., editor. *Classicorum Auctorum e Vaticanis Codicibus Editorum*. Rome, Typis Vaticanis, 1835, vol. 7, p. 451.
  41. *On Sufferings*, 22 (VI, 232-34 L.).
  42. Entries cover more than four columns in Littré's index (X, 640-42).
  43. *Aphorisms*, VI, 27 (IV, 570 L.); VII, 47 (IV, 590 L.).
  44. von Heldreich, T.: *Die Nutzpflanzen Griechenlands*. Athens, Wilberg, 1862, p. 7; Landerer, X.: Über die in Griechenland vorkommenden Arzneipflanzen. *Flora* 39:305-17, 1856; Ostermeyer, F.: Beiträge zur Flora des Jonischen Inseln. *Verh. Zool. Bot. Ges. Wien* 37: 651-72, 1887.
  45. The best evidence is the passage noted above (reference 37) and two references in *Nature of Woman* (chapters 32 and 109), where it is specified that the squill to be used should be "six-fingers long" (ἄσον ἑξαδάκτυλον). It may be noted, however, that the gynecological writings commonly ascribed to Hippocrates are of a much later date (see Stannard, J.: Hippocratic pharmacology. *Bull. Hist. Med.* 35: 497-518, 1961). Some further evidence is supplied by Erotianus, whose source for the following passage may have been a lost (genuine?) Hippocratic treatise. In his collection of difficult Hippocratic words, he writes *σκιλλης τὸ νηρῶδες ἀπὸ τοῦ τῆς βίξης τὸν χύλον*. *Vocum Hippocraticorum Collectio*, Nachmanson, E., editor. Göteborg, 1918, p. 79.
  46. *History of Animals*, V, 30, 556 b 4, Dittmeyer, L., editor. Leipzig, Teubner, 1907, p. 202.
  47. *De plantis*, I, 5, 820a 24-29, Appelt, O., editor. Leipzig, Teubner, 1888, p. 19; *Problems*, XX, 28, 926a 17-21, Hett, W. S., translator. London, Heinmann, Loeb Classical Library, 2 vols., 1936, vol. 1, p. 434.
  48. *Historia plantarum*, I, vi, 7; VII, ix, 4; *De causis plantarum*, I iv, 1, Theophrastus: *Opera Quae Supersunt Omnia*, Wimmer, F., editor. Paris, Didot, 1931, p. 168.
  49. *Historia plantarum*, VII, xiii, 4, (Hort, H., translator, ed. cit., vol. 2, p. 129); cf. *ibid.* II, v, 5 for the use of the bulb in facilitating root growth in a cutting.
  50. *Historia plantarum* I, iv, 3.
  51. For example, oignon marin, oignon de mer, sea onion, cipolla marina, ceba marina, etc. For further examples, see André, J.: *Lexique des Termes de Botanique en Latin*. Paris, Klincksieck, 1956, p. 81, s.v. *cepul(l)a*. The same technique was followed even in regions

- where squill was not native: e.g., *strandlög* (Lange, J.: *Ordbog over Danmarks Plantenaevne*. Copenhagen, Munksgaard, 1960, vol. 2, p. 766; 16th century). In an early 15th century Latin-Slavic lexicon, *squilla* is glossed *morzska czybule* (Brückner, A.: Botanisch-medicinisches Glossar. *Arch. Slav. Philol.* 14:40, 1892.) For the German synonyms (*Meerzwiebel* etc.) see Pritzel, G. and Jessen, C.: *Die deutschen Volksnamen der Pflanzen*. Hannover, Cohen, 1882, pp. 365-66; and references 112, 115, 122.
52. Theophrastus: *The Characters*, XVI, 14, Edmonds, J. M., translator. London, Heinmann, Loeb Classical Library, 1953, p. 83.
  53. Caelius Aurelianus: *On Acute Diseases and On Chronic Diseases*, Drabkin, I. E., editor and translator. Chicago, University of Chicago Press, 1950, p. 790 (*Morb. Chron.* III, 8, p. 122).
  54. Galen apparently had access to Erasistratus' text, for he paraphrases Erasistratus' belief as to the cause of dropsy in his *Introductio seu Medicus*, XIII (XIV, 746, Kühn).
  55. See Jarcho, S.: Ascites as described by Aulus Cornelius Celsus (ca. A.D. 30). *Amer. J. Cardiol.* 2:507-08, 1958.
  56. Celsus: *De Medicina*, III, 21, 8, Spencer, W. G., translator, 3 vols. London, Heinmann, Loeb Classical Library, 1948-1953, vol. 1, p. 317.
  57. Celsus, ed cit., III, 21, 7, p. 317.
  58. Celsus, ed. cit., III, 21, 10, p. 319; repeated in III, 21, 13, p. 321, and, for cough, IV, 10, 3, p. 391.
  59. Squill vinegar: IV, 16, 2; V, 19, 19; VI, 15, 3. Applied topically, squill was regarded as useful for removing callus (V, 28, 12 K) and for old ulcerated sores (VI, 8, 1C). Its use as a counter-irritant (III, 27, 1D) should be compared with the passage cited in reference 19.
  60. For typical excerpts, see Rück, K.: Die Naturalis Historia des Plinius im Mittelalter. *Stzb. Bayer. Akad. Wiss., Philos. Philol. Hist. Kl.* 1:203-318, 1898.
  61. Stannard, J.: Greco-Roman materia medica in medieval Germany. *Bull. Hist. Med.* 46:455-68, 1972.
  62. Wellmann, M.: Sextius Niger, eine Quellenuntersuchung zu Dioscorides. *Hermes* 24:530-69, 1889.
  63. Dioscorides II, 171, Wellmann, op. cit. Cf. also V, 17, Wellmann, op. cit., on squill vinegar (*σκιλλητικὸν ὄξος*).
  64. See Stannard, J.: Byzantine botanical lexicography. *Episteme* 5:168-87, 1971, esp. p. 173 and note 24.
  65. Pliny: *Natural History*, Rackham, H., et al., translators, 10 vols. London, Heinmann, Loeb Classical Library, 1938-1962, XV, xviii, 63; XVII, xvi, 87 (from Theophrastus: *Hist. Plant.*, II 5, 5); XVIII, lxxv, 244; XXI, lxxvi, 106 (from Theophrastus: *Hist. Plant. VII*: 13, 2); XXIII, xxviii, 59; XXXII, xlvii, 135.
  66. *Bulbus scillae* is recommended for dropsy by Scribonius Largus: *Compositiones*, Helmreich, G., editor. Leipzig, Teubner, 1887, chap. 79 (p. 83, Helmr.) and 134 (p. 57) and, cooked with wine, as a diuretic for dropsy and other complaints, c. 126 (p. 55). Squill vinegar (*acetum scillites*) is advised *ad suspirium facit bene*, c. 76 (p. 32) which may suggest a cardiac problem. Finally, in c. 193 (p. 78) there is a reference to itching *velut scilla tactum*.
  67. Pliny: *Natural History*, XIX, xxx, 93-95, Rackham, translator, ed. cit., vol. 5, pp. 481-83. The passage describing the three kinds (*genera*) constitutes the entry for *scilla* in Simon of Genoa: *Synonyma Medicinæ*. Venice, Anima Mia, November 13, 1486, sig. l 2<sup>o</sup>.
  68. Pliny: *Natural History*, XX, xxxix, 97, Jones, W. H. S., translator, ed. cit., vol. 6, p. 59.
  69. Pliny: *Natural History*, XX, xxxix, 98, Jones, W. H. S., translator, ed. cit., vol. 6, p. 59.
  70. Quintus Serenus: *Liber medicinalis*, Pépin, R., editor. Paris, Presses Universitaires de France, 1950, verse 505. Chapter XXVI (verses 493-512) is entitled *Hydropi depellendae*.
  71. For Benedictus' dependance upon



- Quintus, see Stannard, J.: Benedictus Crispus, An eighth century medical poet. *J. Hist. Med.* 21:24-46, 1966. Benedictus' account of dropsy, which does not include squill, is translated on p. 35.
72. Squill is mentioned by Rufus once in a recipe to promote scar formation following the bite of a rabid dog. *Oeuvres de Rufus d'Ephèse*, Daremberg, C. and Ruelle, C., editors. Paris, Imprimerie National, 1879, p. 449. Two other passages, translated into French, mention *scille* (pp. 307, 308) but I have not seen the original. Neither, however, refers to dropsy.
73. Raw squill is applied topically for lethargy (*Morb. Acut. Therap.* I, 2, p. 207) while a second mention of squill occurs in reference to a cure for *elephas* (*Morb. Chron. Therap.* II, 13, p. 341). Aretaeus: *Opera Omnia*, Kühn, C. G., editor. Leipzig, Cnobloch, 1828.
74. *De simplicium medicamentorum temperamentis ac facultatibus*, VIII, 43, (vol. 12, 125, Kühn). Its use for dropsy is not mentioned.
75. Aetius Amidenus: *Libri Medicinales I-IV*. I, 366, Olivieri, A., editor. Leipzig and Berlin, Teubner, 1935 (*Corpus Medicorum Graecorum*, VIII, 1), p. 132. It is interesting to note that Giov. Baptista Montano's translation (Basel, Froben, 1535) does not list squill; instead there are two entries for *cepa* (pp. 15, 18), the first of which resembles the passage in Olivieri's edition.
76. Paulus Aegineta, VII, 3, 2 vols., Heiberg, J. L., editor. Leipzig and Berlin, Teubner, 1921-1924 (*Corpus Medicorum Graecorum*, IX, 1; IX, 2), vol. 2, p. 260.
77. Directions for the preparation of squill pastilles are provided, once in *Ad Pisonem de theriaca* 13 (XIV, 263 K.) and again in *De theriaca ad Pamphilianum* (XIV, 306 K.). In *De remediis parabilibus*, book III, he adds his own recipe for the preparation of squill vinegar (XIV, 567-69 K.) and squill wine (XIV, 569-70 K.).
78. Servilius Damocrates: *Theriaca*, vv. 87-88, 107. In: *Poetae Bucolici et Dactici*, Bussemaker, U. C., editor. Paris, Didot, 1862, p. 120. Squill also occurs as an ingredient in the shorter but equally complex recipe for theriac attributed to Andromachus the Elder, *Theriaca tranquillitas dicta*, vs. 107. In Bussemaker, op. cit., p. 96.
79. Squill occurs about 17 times in Marcellus, *Liber de medicamentis*, Niedermann, M., editor. Leipzig, Teubner, 1916 (*Corpus Medicorum Latinorum*, V) but only three times in connection with dropsy, in a pastille (XXII, 17, p. 173), as one of 73 ingredients in the *Antidotus Cosmiana* (XXIX, 11, p. 229), and cooked (XVII, 1, p. 133) in a recipe which is borrowed from Scribonius Largus c. 76 (see reference 66). For this and other borrowings, see Stannard J.: Marcellus of Bordeaux and the beginnings of medieval materia medica. *Pharm. Hist.* 15:47-53, 1973.
80. Squill is mentioned thrice by Cassius Felix: *De medicina*, Rose, V., editor. Leipzig, Teubner, 1879: twice in a salve *ad scabiem*, c. XV (p. 22), and once in an electuarium, designed to relieve difficult breathing, c. XLI (p. 94). Chap. LXXVI (pp. 181-87), titled *Ad hydropicos*, significantly does not include squill, even though he recommends *cocci gnidii* (the fruits of *Daphne Gnidium* L.) *ex locis maritimis collecti* (pp. 183-84)—precisely where one might expect to find squill.
81. In the long chapter on dropsy (*Morb. Chron.* III, 8, pp. 772-812, Drabkin) squill occurs only twice (section 120, p. 788, and 154, p. 812), the second of which is a paraphrase of Themison. In section 150 (p. 808) *bulbus* may, however, denote squill since earlier Caelius explicitly stated *squilla, quam vulgo bulbum pruriosum vocant* (*Morb. Chron.* II, 1, 33, p. 586).
82. In common with other medical writers, Alexander mentioned both squill and squill vinegar. Alexander of Tralles: *Original-Text und Übersetzung*, 2 vols., Puschmann, T., editor. Vienna, Braumüller, 1878-1879 (I, 531; II, 111, 227, 315, 317, 521). But, like Cassius, in his book *On Dropsy* (*Περί ιδέρον*, II, 439-

- 61) Alexander did not mention squill.
83. Pseudo-Apuleius: *Herbarius*, XLII, Howald, E., and Sigerist, H. E., editors. Leipzig, Teubner, 1927 (*Corpus Medicorum Latinorum*, IV), pp. 90-91. In an anonymous 15th century text, significantly probably of Italian provenance, *squile* is included among the plants and roots *que . . . coligende sunt in octubri* (Wickersheimer, E.: *Epistola Ypocratis ad Alexandrum de tempore herbarum. Janus 41*: 148, 1937).
84. The first section of cap. XLII, titled *Ad idropicos* (p. 90, ed. cit.), describes the preparation of the bulb and its administration with honey or vinegar as a diuretic. Yet, in section 4 (p. 91) the statement *herbae scillae folium subiectum sub lingua sitim conpescit* raises questions concerning the author's clinical experience as well as his knowledge of the earlier tradition in which the bulb, but not the leaves, were used for similar purposes.
85. A ninth century version of the *Herbarius*, written at St. Gall, omitted, probably deliberately, those chapters which dealt with plants unknown in Switzerland. See Landgraf, E.: *Ein frühmittelalterlicher Botanicus. Kyklos 1*: 114-46, 1928.
86. Aelian: *On the Characteristics of Animals*, I, 36, Scholfield, A. F., translator, 3 vols. London, Heinmann, Loeb Classical Library, 1958, vol. 1, p. 55.
87. Artemidorus Daldianus: *Onirocriticon Libri V.*, III, 50, Pack, R. A., editor. Leipzig, Teubner, 1963, p. 225.
88. *Geoponica* (Beckh, H., editor. Leipzig, Teubner, 1895) mentions squill as an amulet for protection against wolves, XVIII, 17, 8, p. 496, and a magical use seems to underlie the secret of using squill to produce seedless grapes, IV, 7, 2, p. 110. Finally, Pythagoras' (!) recipe for squill vinegar occurs in VIII, 42, p. 230.
89. *Mulomedicina Chironis*, Oder, E., editor. Leipzig, Teubner, 1901. Sections 767 and 768, p. 239. Another agricultural practice, the use of crushed squill as an aphrodisiac for a mare, is reported by Varro: *On Agriculture*. II, 7, 8. Hooper, W. D., translator. London, Heinmann, Loeb Classical Library, 1954, p. 386.
90. *Mulomedicina Chironis*, Oder, E., editor. Section 303, p. 90. Much earlier, Virgil (*Georgics*, III, 451) advised a mixture of squill, hellebore, wax, and bitumen as a sheep dip.
91. A case in point is the Middle English translation of Palladius, written about 1420. Twice squill is mentioned (p. 32 line 856, *squylle*; p. 116, line 340, *sqille*). Palladius: *On Husbandrie*, Lodge, B., editor. London, Early English Text Soc., 1872 [1873].
92. *Squilla* is among the plants ordered to be grown in the gardens of the realm according to the *Capitulare de villis*, customarily ascribed to Charles the Great (Boretius, A., editor: *Capitularia Regum Francorum, Monumenta Germaniae Historica, Legum*, Sectio II, vcl. 1. Hannover, Hahn, 1883, p. 90). But that raises a problem about the geographical area in question, because, in some portions of Charles' empire, squill would not survive. Its inclusion thus tends to support on botanical grounds an argument usually sustained on philological grounds: that the capitulary was not issued by Charles for the entire empire but by Louis the Pious (upon his accession in 794-795) for Aquitania alone. For a useful summary of the arguments *pro* and *contra*, see Mayer, T.: *Zur Entstehung des Capitulare de villis. Viert. Soz. Wschr. Gesch. 17*:112-27, 1924.
93. *Squilla* occurs (as number 28) in a nonalphabetized list of names denoting simples. The purpose of the list, entitled *Nomina de picmintis*, has yet to be established. It may have been a list of desiderata for a monastic apothecary; it was certainly not an inventory, for no prices or amounts are recorded, and the absence of space between the two columns prevented its use as a bilingual glossary. See the reproduction in Cailhol, C.: *Les drogues médicinales à Jumièges au X<sup>e</sup> siècle*. In: *Jumièges. Congrès Scientifique du*

- XIII<sup>e</sup> Centenaire*. Rouen, June 10-12, 1954, 2 vols. Rouen, Lecercf, 1955, vol. 2, pp. 703-20, 1 plate.
94. Flückiger, F. A.: Die Frankfurter Liste. *Arch. Pharm.* 201:441, 1872, *squilla marina*; Flückiger, F. A.: Das Nördlinger Register. *Arch. Pharm.* 211: 104b, 1877, *squilla*; La Cava, A. F.: *Igiene e Sanità negli Statuti di Milano del sec. XIV*. Milano, Hoepli, 1946, p. 92, *cepe squille*; von Lingelsheim, A. and Peters, K.: Ueber die bisher älteste Arzneitaxe Deutschlands und eine mit ihr verbundene Medizinalordnung. *Deutsche Apoth. Zeit.* 42: 838b, 1927, *squillitici*; and Dorveaux, P.: *Inventaires d'anciennes pharmacies dijonnaises (XV<sup>e</sup> siècle)*. Dijon, Jacquot et Floret, 1892, p. 20, No. 314, *osimer sireti* (i.e., *oxymel scillitique*).
95. *Diascilles de scilla*, Balzli, H.: *Vokabularien im Codex Salernitanus der Breslauer Stadtbibliothek*. Leipzig, Barth, 1931 (Studien zur Gesch. d. Med., XXI), p. 31; *Cepa . . . d. zubele. cepa marina wurmkrut. cepulacen zübel muoss. . .* Brandstetter, R.: Der Ebingersche Vokabularius. *Herrigs Arch.* 73: 100a, 1885. *Scilla. aizon sive stichias Greci dicunt, quod a Latinis bulbi scilletici dicuntur*. Heiberger, J. L.: *Glossae Medicinales. Det Kgl. Danske Videnskabernes Selskab. Histfilol. Medd.* IX, 1, 1924, p. 75; *Bulbus silicicus, vel rufus, i. squilla*. Mowat, J. L. G.: *Alphita*. Oxford, Clarendon Press, 1887, p. 25a; *Scilla. glaedine*, Lindsay, W. M.: *The Corpus Glossary*. Cambridge, Cambridge University Press, 1921, p. 160, No. 176; *Squilla, Cilla, cepa marina, idem.*, de Renzi, S.: *Alphita. Collectio Salernitana*. Napoli, Filiatre-Sebezio, 1854, vol. 3, p. 315. The above entries are cited in order to convey some idea of the erroneous and inadequate information circulating during the Middle Ages concerning squill.
96. For example, Gilles of Corbeil mentions squill but twice in 4,663 verses studded with names of simples: as an ingredient in *Katharticum Imperiale* for bad breath due to decayed gums (III, 792) and, with oxymel for gout (IV, 1018), but, interestingly enough, *not* included in a remedy for dropsy mentioned just previously (vs. 1010). Aegidius Corboliensis: *Carmina Medica*, Choulant, L., editor. Leipzig, Voss, 1826.
97. Lebede, K.-H.: *Das Antidotarium des Nicolaus von Salerno und sein Einfluss auf die Entwicklung des deutschen Arzneiwesens. Text und Kommentar*. Dissertation. Berlin, 1939, p. 61; Bendorff, E.: *Der "Liber de confectioe medicinarum" im Breslauer Codex*. Dissertation. Leipzig, 1920, p. 15; van den Berg, W. S.: *Eene Middelnederlandsche Vertaling van het Antidotarium Nicolai*. Leiden, Brill, 1917, p. 158; Quiricus de Augustis: *Lumen Apothecariorum*. (Lyon, anon. pr. 1498, ap. Klebs 123.5) fol. XX<sup>v</sup> s.v. *Trocisci de squila*.
98. Wickersheimer, E.: Les secrets et les conseils de maître Guillaume Boucher et de ses confrères. *Bull. Soc. Franç. Hist. Méd.* 8:222, 1909.
99. Squill is listed in the sections titled *De calidis in secundo gradu* and *De sicis in secundo gradu*, Kroemer, G. H.: *Johannes von Sancto Paulo: Liber de simplicium medicinarum virtutibus*. Dissertation. Leipzig, Noske, 1920, pp. 13, 18.
100. *Virtutem habet [sc. squilla] attrahendi, dissolvendi, digerendi, purgandi et vim diureticam*. Müller, E.: *Der Traktat Liber iste*. Würzburg, Triltsch, 1942 (*Texte Unters. Gesch. Naturw.* 7), p. 28.
101. *Squilla herba est venenosa secundum partem sui que trans mare invenitur*, Müller, E., ed. cit., p. 28. Cf. also Zimmermann, L., editor: *Saladini de Asculo. . . compendium aromatariorum*. Leipzig, Barth, 1919, p. 109: *De scylla . . . est venenosa, sicut dicitur*.
102. E.g., *squilla* is included, along with nine other plants, in a section titled *Que frangunt lapidem*. Scheffer, H.: *Ein therapeutischer "Thesaurus pauperum" des 14. Jahrhunderts in lateinischen Versen*. Dissertation. Leipzig, 1921, p. 18, vv. 249-52. Likewise, *acetum squilliticum* is included in the section

- De frangentibus lapidem*, Kroemer, ed. cit. p. 36.
103. The Bamberg Antidotarium (ninth-century) lists an *epithema diamellon* (IV, p. 22) for dropsy which does not include squill, though an *antidotum hieralogadiu* (XXXVIII, p. 81) includes roasted squill (*squilla assa*), *Studien und Texte zur frühmittelalterlichen Rezeptliteratur*, Sigerist, H. E., editor. Leipzig, Barth, 1923 (*Stud. Gesch. Med.* 13). Likewise, the *Luminare maius* of Johannes Jacobus Manlius de Bosco (*floruit* 1490) often mentions both squill (pp. 57, 116, 155, etc.) and recipes for dropsy (pp. 91, 228, etc.) but does not seem to have employed squill in recipes for dropsy, *Das Luminare majus*, Schumacher, B., editor. Mittenwald, Nemayer [1936]. Also cf. Scheffer, ed. cit., p. 13, sect. 54, *Contra ydropisim frigidam*, and sect. 55, *Contra ydropisim calidam*.
104. *Antidotarium Bruxellense*. In: Theodor Priscianus: *Euporiston* . . . Rose, V., editor. Leipzig, Teubner, 1894, sections 33-39, pp. 373-74.
105. Section 34, beginning, *squilla id est bulbus prunis* [sic!], p. 373 and section 38, pp. 373-74.
106. *Scilla* is contained in an *unguentum ad morpheam* from a 14th century text. Pansier, P., editor: *Cirurgia Johannis Jamarii. Janus* 8: 431, 1908. Rubrica XLV.
107. See Pansier, P.: *Experimenta magistri Gilliberti, cancellari montispessulani. Janus* 8: 145, line 7, *squilliticum* (sc. *acetum*), 1908. Section 23, p. 23, *Contra ydropisim* does not, however, refer to squill. An interesting consilium *ad ydropisim* contains a recipe in which exotic diuretics have taken the place of squill, Sudhoff, K.: *Diätetische Verordnung für einen zur Wassersucht Neigenden (mit chronischer Nephritis Behafteten?)* aus dem 15. Jahrhundert. *Sudhoffs Arch.* 3: 79-80, 1909.
108. Giacosa, P.: *Un Ricettario del Secolo XI esistente nell' Archivio Capitolare d' Ivrea. Atti Accad. Torino* 37: 658, 1886, *ad capitis purgaciones*; Creutz, R.: *Der Magister Salernus Aequivocus und sein "Compendium salerni."* *Quell. Stud. Gesch. Naturw. Med.* 5: 15, 1936, sect. 14; but also see sect. 25, p. 17, where *squillae pugillus* is listed under *Si quis nimis vomat* (!). *Scillae* is contained in *Aliud epithema fortius ventrem purgans*, Englert, L.: *Die medizinische Bedeutung des Fragmentum Donaueschingense. Sudhoffs Arch.* 24: 242, 1931.
109. Castellani, C.: *Secreti Medicinali di Magistro Guasparino da Vienezia*. Milano, Stedar, 1959, section 206, *A guarire lo male de la milza*, p. 44. See also Englert, op. cit., sect. 77, which describes a recipe containing squill vinegar in *linteolo inducto spleni adponuntur*, p. 241.
110. de Renzi, S.: *Collectio Salernitani*, vol. 5, Napoli, Filiatre-Sebezio, 1859, p. 76: *Diuretica* (vv. 2588-91), *Lithontritica* (vv. 2592-95).
111. Sudhoff, K.: *Ein Fruchtbarkeitsregimen für Margaretha, Markgräfin von Brandenburg. Sudhoffs Arch.* 9:357, 1916, 1. 13.
112. Castellani, ed. cit., section 93 (p. 21). Slightly different recipes for *unguentum Agrippa* but also containing *squilla* are found in the *Nuovo Receptario* (Florence: Ad instantia delli Signori Chonsoli, January 21, 1498). Facsimile reprint, Florence, Olschki, 1968. sig. h. vr and in the *Cirurgia Peters von Ulm*, Keil, G., editor. Dissertation. Heidelberg, 1960, section 64, p. 246 *mertzweifel*.
113. Lanfranc: *Science of Chirurgie*, von Fleischhacker, R., editor. London, Early English Text Soc., 1894, p. 344.
114. Müller, R.: *Der "Jonghe Lanfranc."* Dissertation. Bonn, Rheinische Friedrich-Wilhelms Universität, 1968.
115. *Squilla/vel cepe muris. erdtzwybelen. seint gross/findestu in apothecis*, von Gersdorff, H.: *Feldtbuch der Wundtartzney*. Strassburg, Schott, 1517., fol. 94va. He was active, however, as early as 1476; cf. Stannard, J.: *Hans von Gersdorff and some anonymous Strassburg apothecaries. Pharm. Hist.* 13:62, 1971.
116. Isidore of Seville: *Etymologiarum sive*

- Originum libri xx*, Lindsay, W. M., editor. Oxford, Clarendon Press, 1911, XVII, ix, 85. Isidore's account of dropsy (IV, vii, 23) does not include a reference to squill.
117. Bartholomew the Englishman: *De proprietatibus rerum*. Basel, anon. pr., ca. 1470, ap. Klebs 149.1, XVII, 43, fol. 141va.
118. Matthaeus Platearius: *Circa instans*. Lyon, de Gabiano, 1537, fol. 93ra: *Squilla calida est et sicca in tertio gradu et alio nomine cepula marina dicitur. . . .* Neither squilla nor cepa occur in a different redaction. Wölfel, H., editor: *Das Arzneidrogenbuch Circa Instans in einer Fassung des XIII. Jahrhunderts aus der Universitätsbibliothek Erlangen*. Dissertation. Berlin and Hamburg, Preilipper, 1939.
119. Vincent of Beauvais: *Speculum Naturale*. Nürnberg, anon. pr., 1486, ap. Klebs 1036.2, lib. X, cap. 137 (non-foliated).
120. This sentence should be compared with the similar claim in Albertus Magnus: ". . . und ist ainerlai des krautes, daz ist vergiftig und toetleich, und wänten etleich, ez waer napelnkraut, aber daz ist niht wâr. . ." "Et quaedam species ipsius [squillae] est venenosa mortalis, et quidam putaverunt eam esse napellum, sed erraverunt." Albertus Magnus: *De Vegetabilibus*, Meyer, E. and Jessen, K., editors. Berlin, Reimer, 1867, p. 561.
121. Konrad of Megenberg: *Das Buch der Natur*, Pfeiffer, F., editor. Hildesheim, Olms, 1962. (Facsimile reprint of Stuttgart, 1861 ed.) V, 77, p. 421. It may be noted that Konrad's chapter is repeated, except for minor orthographical changes, by Hartlieb. See Werneck, H. L.: *Kräuterbuch des Johannes Hartlieb, Eine deutsche Handschrift um 1435/1450 aus dem Innviertel. Ostbairische-Grenzmarken, Passauer Jahrbuch 2: 91-92, section 93, 1958.*
122. Schöffler, P.: *Hortus Sanitatis (germanice)*. Mainz, 1485. Chapter 373 is titled *Squilla, ertzwoebel*. The text proper begins, *Squilla vel cepe muris latine grece salla [sic!] arabice haurifel vel haulachach*. The Arabic names appear to be corrupt forms since they are not listed in Guigues, P.: *Les noms arabes dans Sérapion, "Liber de simplici medicina."* Essai de restitution et d'identification des noms arabes de médicaments usités au moyen âge. *Journ. Asiat.* 5: 534, 1905, s.v. *haspel*.
123. . . . *heyssen etlich meister die squilla muris quia interficit mures. Hortus Sanitatis*, loc. cit.
124. *Squilla . . . hait bletter gleich den blaen lylien und an der wurtzel ist ein gross zwobel; . . . Hortus Sanitatis*, loc. cit.: . . . *eius [scilla] folia sunt sicut lilii*, Albertus Magnus, ed. cit., p. 561.
125. Breyell's account of squilla is copied from the *Hortus Sanitatis (germanice)*. Cf. Bessler, O.: *Das deutsche Hortus-Manuskript des Henricus Breyell. Nova Acta Leopoldina 107: 254, 1952, sect. 339*, just as Hartlieb copied from Konrad (see reference 121). Konrad, in turn, seems to have copied one sentence from Albertus Magnus (see reference 120), unless both accounts derive from a common but unidentified source.
126. *Nascitur [sc. herba cipola marina] prope litus maris. Un Inedito Erbario Farmaceutico Medioevale*, Leporace, T. G., editor. Florence, Olschki, 1952, p. 45. The statement that squill in *Maritimanis partibus* (i.e., the Maremma on the Western coast of Tuscany) *invenitur* is probably based on personal evidence. *The Herbal of Rufinus*, Thorndike, L., editor. Chicago, University of Chicago Press, 1949, p. 303.
127. Since squill is not native to the British Isles, the following statement from a late fourteenth century text must be regarded with suspicion. *Squilla . . . growith in feldes and in brynkes of the see. . . . Agnus Castus. A Middle English Herbal*, Brodin, G., editor. Upsala, Lundquist, 1950, p. 202.
128. . . . *est resolutiva, attractiva sanguis ad exteriora et superfluitatum similiter, et est adustiva, ulcerativa, subtiliativa valde humorum grossorum, incisiva plus quam calefactiva, et ipsius acetum*

- confortat corpus debile, et acquirit ei sanitatem. Albertus Magnus, ed. cit., p. 561; cf. also Rufinus, ed. cit., p. 303: Virtutem habet atrahendi, disolvendi, purgandi et humetande. Atrahit enim humores a superioribus et digestionem operatur in inferioribus et etiam educit.
129. . . confirmat dentes motos, et confert foetori oris, et ejus comestio acuit visum. Albertus Magnus, loc. cit. Squilla ist gut genutzt ad appoplexiam das ist fur den slag und auch sunderlich ad epilenciam. *Hortus Sanitatis*, loc. cit. In the expanded *Ortus Sanitatis*, the *operationes* of squilla occupy three folio columnis. *Ortus Sanitatis*. Strassburg, Prüss, 1497. *De herbis*, cap. 454, sig. Ee iii<sup>rb</sup>-Ee iv<sup>rb</sup>.
130. For example, the use of squill to promote growth of hair, *Hortus Sanitatis*, loc. cit., or to *hele bytyng of addres and of other venemes bestes*, *Agnus Castus*, loc. cit.
131. . . *heyss und drücken an dem andern grad*, *Hortus Sanitatis*, loc. cit.; *he [! squilla] is hote and drye*, *Agnus Castus*, loc. cit.; . . . *siin heet ende droge in den .2. graet*, Vandewiele, L. J., editor. *De Herbariis*. Brussel, Paleis der Academiën, 1965, p. 457.
132. . . *he (! squilla) wol make a man to kaste*, *Agnus Castus*, loc. cit.; . . . *purgat flegma diuretica*. Rufinus, ed. cit., p. 304.
133. . . ist auch guot widder wasser suchtikeyt, *Hortus Sanitatis*, loc. cit.; . . . if a man have the dropesye tak this herbe and seeth hure with eysel and gif hym to drynk and he schal be hol, *Agnus Castus*, loc. cit.; . . . confert hydropisi, Albertus Magnus, loc. cit.
134. Squilla est venenosa secundum partem sui que in Maritimanis partibus invenitur. Quod est in centrum mortiferum est; propter nimiam frigiditatem mortificat; quod antem exterius propter nimiam caliditatem. Rufinus, ed. cit., p. 303.
135. Cf. the passage from the *Hortus Sanitatis*, cited in reference 123. For modern methods, see Crabtree, D. G.: Red squill—Most specific of the raticides. *Econ. Bot.* 1: 394-401, 1947.
136. Serapio spricht das man diss zwobel so sie gebraten ist nutze in vieln confecten. und sunderlichen in die wole riechenden speceryen. *Hortus Sanitatis*, loc. cit.
137. The illustration of squilla in the *Hortus sanitatis (germanice)*, cap. 373 (reproduced by Hirschfeld, op. cit., Abb. 7, p. 171), is crude, but the combination of the bulb and the broad leaves leave no doubt as to its identity. The inflorescence is even cruder and resembles more two over-simplified panicles than the typical raceme. Nonetheless, the illustration is superior to that of the *Ortus Sanitatis*, ed. cit., cap. 454. In the latter, the inflorescence has been transformed into a meaningless, trifoliate structure.
- In manuscript herbals, the drawings are crude but recognizable: e.g., the colored drawing in a 14th century herbal, *De simplicibus medicina*, Pfister, A., editor. Basel, Schwitler, 1961, fol. 30r. There are references to illustrations of squill in other editions of medieval texts but the illustrations themselves are not reproduced: e.g., Amsler, H.: *Ein handschriftlicher illustrierter Herbarius aus dem Ende des 15. Jahrhunderts*. Herzogenbuchsee, Staub-Schärer, 1925, p. 47, No. 454; and Fischer, H.: Vitus Auslasser, der erste bayrische Botaniker und die Beziehungen seines Herbarius von 1479 zu den Anfängen der bayrischen Botanik. *Ber. Bayr. Bot. Ges.* 18:16, 1925, No. 100.
138. *Incantator autem dicit, quod, si [squilla] suspendatur super eum, qui habet splenem durum, quadraginta diebus, liquefacit splenem. . . . Dicit autem incantator, quod, si suspendatur super portas, prohibet introitum venenosorum*. Albertus Magnus, loc. cit.
139. Marinatos, op. cit., 224, No. 1, notes that in his native village squill was hung over the door on the first day of the New Year. In Palermo, squill was included in a charm against erysipelas. Pitré, G.: *Medicina Popolare Siciliana*. Florence, Barbèra, 1949, p. 227.