

# Alchemical Gold and the Pursuit of the Mercurial Elixir

*An Analysis of Two Alchemical Treatises from the Tibetan Buddhist Canon*

Carmen Simioli

University of Naples 'L'Orientale', Italy

*carmensimioli2@gmail.com*

## Abstract

This article focuses on the analysis of two Tibetan treatises on iatrochemistry, *The Treatise on the Mercurial Elixir* (*Dngul chu grub pa'i bstan bcos*) and the *Compendium on the Transmutation into Gold* (*Gser 'gyur bstan bcos bsdu pa*). These texts belong to the *rasaśāstra* genre that were translated from Sanskrit into Tibetan by Orgyenpa Rinchenpel (O rgyan pa Rin chen dpal, 1229/30–1309) and integrated into the Tibetan Buddhist Canon of the *Tengyur* (*Bstan 'gyur*). The treatises deal with the processing of mercury, which is indispensable to convert metals into gold (*gser 'gyur*) and to accomplish the 'mercurial elixir' (*dngul chu'i bcud len*). The texts start with the description of a 'pink-coloured' (*dmar skya mdog*) compound, which is described as the amalgam of 'moonlight-exposed tin' (*gsha' tshe zla ba phyogs*), gold, and copper. According to the texts, mercury has to be 'amalgamated' (*sbyor ba*) with 'minerals that devour its poisons' (*za byed khams*) and with 'eight metals that bind it' (*ching khams brgyad*); at the same time, mercury is cooked with 'red substances' (*dmar sde tshan*) and other herbal extracts, types of urine and salts, and reduced to ashes. Starting with an outline of the earliest Tibetan medical sources on mercury, I analyse the two treatises with regard to their entire *materia alchemica* and the respective purification methods aimed at 'obtaining essences' (*snying stobs*), which are then to be absorbed by mercury. I argue that the two thirteenth-century treatises were particularly significant in the process of consolidating pharmaceutical practices based on mercury and the merging of alchemical and medical knowledge in Tibet.

## Keywords

mercury processing – fixation – trituration – metal calcination – extraction – alchemical transmutation – elixir – Orgyenpa Rinchenpel – *Tengyur*

## Introduction: Mercury in Early Tibetan Medical Texts

Whether to cure diseases or to prolong the lifespan, mercury-based remedies play an important role in Tibetan medico-alchemical systems. According to the *Four Tantras* or *Gyüshi* (*Rgyud bzhi*)<sup>1</sup> mercury, once ‘purified’, ‘pacifies all kinds of diseases’ (*nad kun zhi byed pa'i log gnon*), especially severe diseases such as ‘small pox’ (*'brum nag*), ‘leprosy’ (*mdze nad*), or ‘poisoning’ (*dug*); it also dispels illness-causing demonic forces known as *dön* (*gdon*).<sup>2</sup> This paper<sup>3</sup> begins with an outline of mercury in early Tibetan medical texts and then proceeds to analyse two specific works translated by Orgyenpa Rinchenpel (O rgyan pa Rin chen dpal, 1229/30–1309): *The Treatise on the Mercurial Elixir* (*Dngul chu grub pa'i bstan bcos*) (hereafter *DGB*, see Fig. 1),<sup>4</sup> in Sanskrit *Rasasiddhiśāstra*, and the *Compendium on the Transmutation into Gold* (*Gser 'gyur bstan bcos bsdus pa*) (hereafter *GBB*),<sup>5</sup> in Sanskrit *Rasaśastroddhṛti*. My research for this paper is based on the Derge (Sde dge) versions of these two treatises. Any variations among the various *Tengyur* editions are fully provided in the *Comparative Edition* (*Dpe bsdur ma*) of the Beijing (Pe cin) *Tengyur*.<sup>6</sup> In this article, only those variations that I consider relevant for this study are mentioned in footnotes, added by the specific place name of the respective versions.<sup>7</sup> Otherwise, if no specific place name is mentioned for the *DGB* or the *GBB*, I am referring to the Derge versions that I am focusing on. However, this article neither presents a complete translation of the *DGB* and the *GBB*, nor a critical edition of these texts. Instead, it aims at showing the relationship between alchemical transmutation and the development of mercury-based pharmacology. The paper focuses on ways in which these two treatises played

1 For details on the debated origins of the *Gyüshi* see, for example, Czaja 2005/06, Karmay 1998. On relations of Tibetan medicine with Greco-Arabian medical traditions, see Yoeli-Tlalim 2010, 2011, and 2012.

2 *Gyüshi* 50/5–51/2. For an interpretation of *dön*, see Namkhai Norbu 1995, pp. 142–4.

3 I thank Barbara Gerke for reading through this paper at various stages, offering valuable suggestions, and editing my English. All remaining errors are my own.

4 Töb 4313, *Bstan 'gyur* (Sde dge), vol. 203 (*mdo 'grel, ngo*), ff. 1r/1–7r/3.

5 Töb 4313, *Bstan 'gyur* (Sde dge), vol. 203 (*mdo 'grel, ngo*), ff. 7r/3–8v/4. For Prafulla C. Ray's translation of the *GBB*, see Ray (ed.) 1956, pp. 466–73.

6 Töb 4313, *Bstan 'gyur* (Pe cin) (*sna tshogs, ngo*), vol. 114, pp. 843–59 and Töb 4313, *Bstan 'gyur* (Pe cin) (*sna tshogs, ngo*), vol. 114, pp. 860–6. Note that the Pe cin edition only provides page numbers, not folios.

7 I have compared the Derge *DGB* and *GBB* with the Narthang (Snar thang) edition of the *Tengyur*. Töb 3806, *Bstan 'gyur* (Snar thang), vol. 211 (*bzo rig, go*), ff. 373r/7–383r/6 and 3v/2–5v/5.

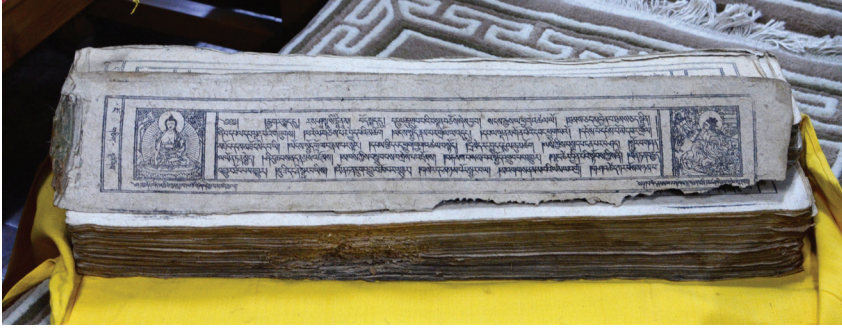


FIGURE 1 The Treatise on the Mercurial Elixir, from the Shantarakshita Library at the Central University of Tibetan Studies in Sarnath, India. This manuscript is about 300 years old and belongs to a collection that the Fourteenth Dalai Lama brought to India when fleeing Tibet. (Photo: Barbara Gerke)

a significant role in the process of consolidating Tibetan pharmaceutical mercury practices in later texts.

From the Dunhuang manuscripts we know that the therapeutic use of mercury in Tibet dates back to the ninth or tenth centuries. One of these manuscripts attests that mercury sulphide or cinnabar, known as *tsel* (*mtshal*), was utilised in ointments against skin disorders and virulent exudations.<sup>8</sup> The *Medical Method of the Lunar King* (*Sman dpyad zla ba'i rgyal po*), in chapter 97, offers minimal reference to mercury as *ngülchu* (*dngul chu*), which is amalgamated with gold, a substance that is 'like gold' (*gser dang 'dra*), 'mineral pitch exudates' (*brag zhun*), cinnabar, two kinds of 'malachite' (*lig pu tsa ba* and *pho lig pu*), and 'honey' (*sbrang rtsi*).<sup>9</sup> Another ancient source on mercury is *Biji's Yellow Covered Book* (*Bi ci'i pu ti kha ser*, also *Bi ji po ti kha ser*), which is ascribed to the eighth-century doctor Biji Tsempashilaha (Bi ci Tsan pa shi la ha). The first chapter contains a small section on the curative methods using

8 The Dunhuang manuscripts on Tibetan medicine do not mention mercury as such, but mercury sulphide or cinnabar. For example, *Pelliot Tibétain 1057* prescribes a remedy made of several herbs and roots, and a topical pomade of fine gold and cinnabar to cure 'freckles' (*smye ba*). See *Pelliot Tibétain 1057* 1/1–11 and 10/19–20. *Pelliot Tibétain 1057* is a Tibetan medical manuscript re-discovered at Dunhuang Mogao site and preserved at the Bibliothèque Nationale de France. The manuscript, without title and colophon, is written in *dbu can* script and consists of 13 folios (496 lines) describing 36 remedies for different diseases (see Lalou 1950). The scanned version of the manuscript can be consulted at the International Dunhuang Project (IDP), URL: <idp.bl.uk>, or at Gallica Bibliothèque Numérique, URL: <galliga.bnf.fr>.

9 *Sman dpyad zla ba'i rgyal po* 58v/2–59r/4.

mercury sulphide, here called *dachu* (*da chu*).<sup>10</sup> Detailed descriptions of detoxification methods and of specific external and internal applications of mercury are documented in several medical collections of the eleventh, twelfth, and thirteenth centuries, such as the *Hundred Thousand Clenched Hands* (*'Bum khu tshur*)<sup>11</sup> by Bharo Chakdum (Bha ro phyag rdum, eleventh century),<sup>12</sup> the *Eighteen Auxiliary Teachings* (*Cha lag bco rgyad*),<sup>13</sup> as well as the *Gyüshi*.

The eleventh chapter of the *Subsequent Tantra* (*Phyi ma'i rgyud*) of the *Gyüshi* prescribes mercury for two types of precious compounds: the 'hot' method (*tsha 'dul*) and 'cold' method (*grang 'dul*) of subduing<sup>14</sup> mercury to produce 'pills' (*ril bu*), 'decoctions' (*thang*), 'ash medicines' (*thal sman*), and 'medicinal butter' (*sman mar*).<sup>15</sup> The 'hot' method consists of adding mercury to previously triturated 'gold' (*gser*), 'silver' (*dingul*), 'copper' (*zangs*), and 'iron' (*lcags*). The melted compound is finally mixed with 'sulphur' (*mu zi*). A series of herbal substances, Tibetan beer, and cow's urine are mixed in until the compound becomes a molasses which is then formed into pills. These cure 'gout' (*dreg nad*), 'rheumatism' (*grum bu*), 'cancer' (*'bras*), purulent spots called *surya* (*sur ya*), 'leprosy' (*mdze*), 'channel disorders' (*rtsa nad*), 'hot tumours' (*tsha skran*), 'ascites' (*dmu 'or*), and dry out 'purulent secretion caused by excess of cold' (*grang nag*). In the case of the 'cold' method, the process is divided into three parts: (1) the methods to detoxify and prepare mercury, (2) compounding

- 
- 10 Mercury sulphide along with other substances can cure *chuser* (*chu ser*) and other kinds of 'putrefactions' (*rul ba*). See *Bi ci pu ti kha ser*, 26/16–27/11. The same term *dachu* returns as a synonym of *ngülchu* in the *Explanation of the Word's Meaning in Five Parts* (*Ming don brda sprod rnam lnga*), one of the first Tibetan medical dictionaries, which is ascribed to Vairocana. See *Cha lag bco brgyad* 388/17.
- 11 Chapter 44 of this text deals with a four-fold practice consisting of the elimination of external impurities of mercury, here called *zhü* (*zhud*), the use of 'antidotes' (*gnyen po'i rdzas*), the 'subduing methods' (*btul ba'i thabs*), and the 'separation of pure parts [of metals] from adventitious sediments' (*dangs snyig ma 'byed pa*). Chapter 16 describes the preparation of mercurial pills made of mercury, sulphur, *Terminalia chebula*, the meat of a female yak, *dri* (*'bri*), the urine of an eight year-old child, water or fermented barley beer used as a 'vehicle substance' (*stan rta*), and a series of different 'substitutes' (*kha bsgyur*), which are selected based on the disease to be cured. Chapter 74 focuses on the cure of *chu ser* by mercurial pills and purgative methods. *'Bum khu tshur* 59/13–61/23, 381/3.
- 12 This doctor lived around the eleventh century and could be identified with Jinamitra from Oḍḍiyāna. Martin 2007, pp. 315–17. On Bharo Chakdum, see also Jampa Trinlé 2000, pp. 121–3.
- 13 The tenth chapter of *Eighteen Auxiliary Teachings* describes two kinds of mercurial pills: those that 'cure [illness deriving from] heat' (*tsha sel*) and those that 'cure [illness deriving from] cold' (*grang sel*). *Cha lag bco brgyad* 560/17–561/6.
- 14 On 'subduing' mercury, see Dolma, this issue.
- 15 *Gyüshi* 50/2–54/2. See also Czaja, this issue.

mercury with other medicines that are selected on the basis of the disease to be cured, and (3) countermeasures to contrast the bad effects of unprocessed or wrongly processed mercury. Also in the same chapter, among other general remedies, a mercury-containing rejuvenating preparation or *chülen* (*bcud len*) is mentioned.<sup>16</sup>

This 'cold method' is identically described in the *terma* (*gter ma*) text *Great Vase of Amrita* ('*Chi med bdud rtsi bum pa*'), ascribed to Padmasambhava (eighth century), successively 'rediscovered' around the eleventh century by Dorbum Chökyi Drakpa (Rdor 'bum Chos kyi grags pa), and preserved in the *Treasury of Rediscovered Teachings* (*Rin chen gter mdzod*).<sup>17</sup>

To understand the origin and the standardisation of the procedures of medicinal mercury detoxification, it is important to analyse the relationships between Tibetan pharmacology and the branch of alchemical knowledge dealing with the transmutation of basic metals into gold (*gser 'gyur*). Historically, the developments of Tibetan practices of alchemical transmutation of metals into gold are clearly related to the Tibetan assimilation of Indian tantric alchemy.<sup>18</sup> One of the early sources on alchemical transmutation that arrived in Tibet from India was the *Kālacakra Tantra*. Introduced to Tibet in 1027 AD, it was systematised along with its commentary, the *Vimalaprabhā*, by the end of the eleventh century. The *Kālacakra Tantra* combines the 'six-fold yoga' (*yan lag drug gi rnal 'byor*) with the alchemical practice of the transmutation of metals to produce a potent mercurial remedy.<sup>19</sup>

A significant correlation between Tibetan practices of mercury detoxification and alchemy is particularly noticeable in the thirteenth century, when Tibetan literature was enriched by new translations from Sanskrit.

### Mercury in the *Tengyur*

Mercury features in various texts that were included when the Tibetan Buddhist Canon was compiled in the fourteenth century. The 'Translated Treatises' or *Tengyur*, apart from the *DGB* and the *GBB*, have preserved two further Indian alchemical treatises: the *Essence that Transforms into Gold* (*Gser 'gyur rtsi*), in Sanskrit *Dhātuvāda*, which was authored by an unknown master

16 *Gyüshi*, 53/3. The term *chülen* literally means 'extracting the essence'. On *chülen* in the *Gyüshi*, see Gerke 2012 (2013) and on *chülen* in contemporary Tibetan medicine, see Gerke 2012.

17 *Slob dpon pad 'byung gi sman yig gces btus* 89/10–93/8. *Rin chen gter mdzod*, vol. 46, 90r/1–93r/5.

18 See Samuel 2010.

19 See Fenner 1979, pp. 151–79.

called Nali, and *The Universal Lord's Elixir which, Dispelling all the Diseases, Promotes Physical Strength* (*Thams cad kyi dbang phyug gi bcud len nad thams cad 'joms shing lus kyi stobs rgyas par byed pa*).<sup>20</sup> I discuss these two texts in another paper.<sup>21</sup> Here, instead, I chose to analyse the *DGB* and *GBB*, because they include a more articulate and detailed explanation on processing mercury. The various Canon editions categorise the two treatises under different sections: some include them in the 'miscellaneous section' (*sna tshogs*), others in the 'arts and crafts' (*bzo rig*) section,<sup>22</sup> which in itself shows that, even though the two treatises refer to the medical use of mercury, they were not considered exclusively 'medical' in character. Their varied categorisation is rather indicative of their alchemical and metallurgical content. The *DGB* and *GBB* focus on 'external' alchemy, which, as will be clear from the following analysis, aims at obtaining a perfect and divine body through a mercurial elixir. This involves complex practices to detoxify mercury along with eight metals, numerous minerals, herbs, salts, urine, and other animal products, such as milk, ghee, animal gall bladder, and bones.

The *DGB* and the *GBB* were both translated from Sanskrit into Tibetan by Orgyenpa Rinchenpel, an eminent master of the Töd Drukpa Kagyü lineage.<sup>23</sup> As narrated in his hagiographies, Orgyenpa received the secret instructions on the internal and external alchemical methods to prepare mercury during his spiritual journey to Oḍḍiyāna (O rgyan yul),<sup>24</sup> which corresponds to the Upper Swat valley in present-day north Pakistan.<sup>25</sup> Similar to many root teachings of the Tibetan Buddhist Kagyü tradition, the origin of the *DGB* and the *GBB* can be traced back to the Indian *siddhas*.<sup>26</sup>

20 Tōh 4313, *Bstan 'gyur* (Sde dge), vol. 203 (*mdo 'grel, ngo*), ff. 17v/1–18r/2. This work describes how to purify mercury, obtain 'the white silver', and prepare mercury pills for medicinal and rejuvenating purposes.

21 Simioli (forthcoming).

22 The Derge *Tengyur* categorises the two treatises under the 'arts and crafts' section, whereas the *Comparative Edition* lists them under 'miscellanea'.

23 *Deb gter snqon po* 816/3–825/9. Kagyü (Bka' brgyud) means 'oral lineage' and refers to one of the six main schools of Tibetan Buddhism. The Drukpa Kagyü ('Brug pa bka' brgyud) school is one of its sub-schools that was founded by Tsangpa Gyare Yeshe Dorjé (Gtsang pa rgya ras Ye shes rdo rje, 1161–1211). One of its sub-sects is the Töd Drukpa Kagyü school, founded by Gotsampa Gonpo Dorjé (Rgod gtsam pa Mgon po rdo rje, 1189–1258). Orgyenpa Rinchenpel was a disciple of Gotsampa Gonpo Dorjé.

24 *Grub chen o rgyan pa'i rnam par thar pa byin brlabs kyi chu rgyun* 55v/4. See also Li 2011.

25 Li 2011, p. 126.

26 Here, this term refers to various groups of itinerant mystics who have lived in India since the fifth century. These were the pivotal figures in the development of both Hindu and Buddhist tantrism. See White 1996, pp. 1–14, 123–70.

According to their colophons, the two treatises were authored by Vyāḍipā, in Tibetan Bhalipa (*Bha li pa*), who is listed among the Indian medieval *rasasiddhas*, the masters of the secret art of alchemical transmutation.<sup>27</sup> The lack of historical evidence on the author himself and the authorship of the two works do not allow us to date these treatises, but place them within the corpus of Indian tantric alchemical texts. The absence of the Sanskrit originals of the *DGB* and the *GGB* precludes a comparative approach, denying us the opportunity to understand whether the Tibetan texts are simply a translation of missing Sanskrit sources or not. However, the inclusion of these treatises into the Canon mirrors the profound impact that Indian iatrochemistry, as a branch of the late Buddhist tantric knowledge, had in Tibet during those centuries. Similarly to what happened in India during the fourteenth century, when Ayurveda incorporated the methods of tantric alchemy,<sup>28</sup> these esoteric teachings brought by Orgyenpa from Swat, had a significant influence on the codification of Tibetan mercury-based pharmaceutical practices during the fourteenth and the fifteenth centuries. In fact, these instructions were transmitted within different Tibetan medical lineages such as Drangti (Brang ti) and Zur (Zur).<sup>29</sup> The remarkable process of integrating transmutational alchemy or 'gold making' (*gser gyur*, lit. 'transformed into gold') into Tibetan medical pharmacology reminds us of the contiguity and the interrelationship between alchemy and medicine that characterised different cultures for many centuries.

In the following, I analyse the two treatises in terms of actual practices and *materia alchemica*. I decided to deal with both treatises because when compared, the *DGB* and *GGB* present some interesting similarities and differences. I also discuss the link between 'gold making' and the 'alchemy of the mercurial elixir' (*dn̄gul chu'i bcud len grub pa*).

### The Practices and the *Materia Alchemica* in the *DGB* and the *GGB*

As indicated by the Sanskrit titles, the *DGB* and the *GGB* come under the textual category of *rasaśāstra* or Indian alchemical treatises which include sections

27 The historicity of Vyāḍipā, also called Vyāḍi or Vyālipā, cannot be traced with certainty. Only few literary sources exist, which consist of some hagiographies and lists of *rasasiddhas*. See the *Hagiographies of the Eighty-four Siddhas* (*Grub thob brgyad bcu rtsa bzhi'i rnam thar*), the fourteenth-century Tibetan version of the eleventh-century work *The Lives of the Eighty-four Siddhas* (*Caturaśītisiddha Pravṛtti*) preserved in various versions of the Canon. A short legend is narrated by Alberuni in his eleventh-century *History of India*. Sachau 1910, vol. I, p. 190. On *rasasiddhas*, see White 1996, pp. 80–6.

28 On the relationship between Ayurveda and tantric alchemy, see White 1996, pp. 51–6.

29 See Czaja, this issue. See also Yonten Gyatso 1991.

on iatrochemistry. Vyāḍipā's treatises stress the practical aspects of alchemy because the two texts consist of hands-on instructions while emphasising the philosophical and religious significance of the alchemical process. Indeed, these highly structured procedures are based on a series of implied metaphysical postulations, such as the theory of constitutional and structural homologies of the substances, and especially the links between the divine, human, and metal realms. These affinities determine the alchemical reintegration of finite entities into the absolute, which on a material level reflects the obtainment of the perfect metal.

The dedication at the beginning of the text introduces us to the tantric milieu of the treatises. The opening verses of the *GBB* allude to a *śaiva* framework as we can see from the dedication to Ísvara and Ísvarī. In the *DGB*, the verses are identical, but we have Buddha instead of Śiva. The prologues introduce the content of the two treatises, offering a series of aphorisms on the extraordinary properties of mercury, mica, and sulphur, which, according to the *śaiva* alchemical tradition, correspond to the divine sexual essences.<sup>30</sup> Just as Śiva/Buddha acts, manifesting himself through the infinite impure world, mercury, being the metallic form of the transcendent being, is essentially pure, but is combined with corrupted substances. According to the *DGB*:

It will be explained [how to separate] the supreme mercury, which is naturally pure, from the tainting alloys by means of the opus. [Mercury, once] joined, instils merits into the others. The moribund person overcomes the diseases; the expert practitioner who masters it will overcome hunger. Dried mercury transforms the practitioner into a *gandharva*.<sup>31</sup> By means of mica, the eight qualities will be obtained. When [mercury] is coagulated with sulphur, the six qualities will be obtained. When [mercury] is mixed with gold, you will fly through space without obstacles.<sup>32</sup>

And the *GBB* explains:

Concretely apply the operations aimed at blending the absolutely uncorrupted mercury. When the quintessence is perfectly joined, [it] will

<sup>30</sup> White 1996, p. 144.

<sup>31</sup> *Gandharva*, in Tibetan *khachö* (*mkha' spyod*), means 'celestial musician' and refers to a class of demigods who, according to Indian mythology, guard the divine nectar of immortality. See White 1996, pp. 10, 132, 331, 462.

<sup>32</sup> *DGB* (Sde dge) 11/3–5.



produce qualities. Swooned<sup>33</sup> [mercury] overcomes diseases, matured<sup>34</sup> [mercury] avoids poverty, and bonded [mercury] gives the power of flying through space. These are the three qualities of mercury. If mica is the medicine [which is amalgamated], eight are the qualities [that will be obtained]. Once sulphur is digested, six qualities [will be obtained]. When mercury is concretely bound with gold, nothing will hinder you from flying through space.<sup>35</sup>

The alchemical process corresponds to the restoration of the pristine pureness and unity that is guaranteed by the identification of mercury with the *quinta essentia* and by its union with the two female mineral counterparts (mica and sulphur). It can be assumed that the operations are aimed at obtaining an agent of perfection, which can transmute metals into silver or gold. As asserted in the *DGB*, the capacity of purified mercury to convert metals is a required prerequisite to obtain the universal medicine, and even the alchemical elixir that grants rejuvenation and physical immortality. The mercurial elixir bestows 'physical strength' (*stobs chen*), 'long life' (*yun ring gson*), 'prevents the signs of ageing such as white hair and wrinkles' (*skra dkar gnyer ma thams cad spong*), restores youth, and makes the alchemist live in the abode of the immortals, here represented by the sun, the moon, and the stars (*ny'i zla skar ma gnas par 'tsho*).<sup>36</sup> Being depicted as a realised practitioner, the alchemist is a connoisseur (*gser 'gyur ba'i mkhas pa*) who, by means of perfected mercury, has obtained physical and spiritual powers: he has achieved the mundane realisation of flying in the sky like a *gandharva* and the capacity to produce an elixir, which, by becoming a source of nutrition, allows him to avoid ordinary food, to overcome hunger, and to cure those diseases of ageing that lead to death.

According to the *DGB*, the elixir 'cures severe diseases, such as leprosy, etc.' (*mdze la sogs pa'i nad brgyad 'joms*). The use of alchemically prepared mercury to cure leprosy and the other eight kinds of unspecified diseases—most probably obstinate skin disorders that in Ayurveda are classified as *kuṣṭha*—

33 The Tibetan term *gyabwa* (*brgyal ba*) means to fall unconscious. It translates the Sanskrit verb *murch* or *mūr̥ch*, which means to swoon and to become solid or to be coagulated. See Das 1998, p. 342 and Monier-Williams 1960, p. 823. This phase consists of triturating mercury with herbal substances and acids, and fundamentally amalgamating mercury with sulphur in order to prepare medicines.

34 *GBB* (Snar thang) 3v/6.

35 *GBB* (Sde dge) 7r/5–6.

36 *DGB* (Sde dge) 6v/7–7r/1.

illustrates the transitions that were happening between the alchemical and the medical domains at the time when the texts were written.

The treatises continue to stress the importance of the amalgamation of mercury with mica and sulphur in order to render mercury thermo-stable and to catalyse it. The original and perfect state, which is determined by the union of opposite principles, is defined as embryonic. According to the *DGB*:

Having digested<sup>37</sup> mica, mercury is controlled; the doors of Kubera's golden treasure<sup>38</sup> will be disclosed. The immaculate-faced mica is bound with fire. Guided by sulphur, the water<sup>39</sup> comes into being within the golden womb. Once unified, nothing is more precious on earth.<sup>40</sup>

While the *GBB* states:

After having devoured<sup>41</sup> the vast space,<sup>42</sup> and having devoured the yellow sulphur, it becomes the same viscous substance of the golden womb; among the treasures existing on earth, it is the most precious.<sup>43</sup>

The alchemical process is conceived as dialectic consumption: mercury eats mica and sulphur, and other minerals will devour mercury until it, deprived of poisons, will absorb the metallic essences. The epithet of the 'corrupted body' (*lus ngan po*), which, refers to the deformed Lord of Wealth, Kubera, is not only

37 *Zhuwa* (*zhu ba*) means 'to melt' but also 'to digest'. This is the *jāraṇā saṃskāra* through which mercury is amalgamated with mica and sulphur in order to assimilate or 'digest' the two minerals. Thus, I prefer to translate *zhuwa* as 'digest'. On the *jāraṇā saṃskāra*, see Dash 1986, pp. 76–7.

38 The metaphor of Kubera's treasure appears in the *Rasadarpaṇa*, a lost alchemical work, which has been attributed to Revaṇa Siddha. Some excerpts of this treatise have been handed down to us by Ṭodarānaṇḍa (fifteenth century). See Dash and Kashyap 1994, p. 428; White 1996, p. 23.

39 Here, 'water' corresponds to the Sanskrit *ojas* or vital fluid, to which *rasa* and, in this case, mercury is homologised. This is what occidental alchemy defines as *aquina forma permanentis*. See Pereira 2000, p. 137.

40 *DGB* (Sde dge) 2r/3–5.

41 The word used in the treatises is *zawa* (*za ba*), which means 'food' but also 'the act of eating'. It could also be translated as a 'mouthful'.

42 The identification of mica with space is confirmed in the *DGB*, where it is stated that 'space is one of the names of mica' (*lhang tsher nam kha'i mung brjod*). Cfr. *DGB* (Sde dge) 4r/1. The same metaphor appears in the *Kālacakra Tantra*. Fenner 1979, p. 152. A Sanskrit synonym of *ābhṛaka* (mica) is *vyoma*, which means 'sky'. White 1996, pp. 210–12, 241, 459–60, 477.

43 *GBB* (Sde dge) 7v/1.

a metaphor, because it is used again in the *DGB*; to be precise, it is enumerated among the ‘substances used to process silver’.<sup>44</sup> It most probably refers to ‘lead’ (*zha nye*), which, according to the *DGB*, ‘naturally contains the watery substance’ (*rang bzhin yang shing khu ba can*), i.e. mercury, as well as tin. Tin is its white counterpart, which can be liquefied quickly and determines the transmutation into silver.<sup>45</sup> The ‘black serpent’ (*klu nag*), i.e. lead, contains the water (mercury) that is the secret matrix of the universe. At the same time, ‘water’ is the golden embryo, the elixir that is generated from the fiery union of mercury with mica and sulphur. The incipits continue to describe the union of mercury with seeds of tin, silver, gold, and copper, a union that leads to the obtainment of a pale yellow elixir or, as stated in the *GBB*, a ‘pink-coloured’ (*dmar skya mdog*) compound, which when exposed to fire is stable and possesses the characteristic of ‘matured space’ (*nam mkha’ smin pa*):<sup>46</sup>

Tin is thrust by mercury until they are amalgamated. During the half of the second moon, the lunar tin<sup>47</sup> is mixed with gold. Copper will be penetrated sixty-four times. Do not waste a drop of it. The pink-coloured [compound] bestows richness. Placed on fire, it becomes immovable; these are the qualities of matured space. Whatever substance is melted with mercury, silver or even gold, becoming one with it, is inexhaustible.<sup>48</sup>

The same operation is described more clearly in the *DGB*:

Tin once amalgamated is killed. The double amount of it is combined with silver; the double amount of mercury is mixed. In the same way, gold is amalgamated. Copper is pierced 64 times. This is the yellow pale

44 *DGB* (Sde dge) 5v/6.

45 *DGB* (Sde dge) 2v/4.

46 This refers to the method of purifying tin and synthesising gold and silver using tin. This alloy, because of mica, is able to stabilise mercury. Because tin is amalgamated with silver, the compound maintains its silvery colour. It is mixed with gold or copper in order to obtain gold, which as stated in the above verses can be characterised by a vast chromatic scale ranging from pale yellow to pink. See Deshpande’s article on the eighteenth chapter of *Rasopaniṣat*, a twelfth-century treatise that includes an entire chapter on the method to immobilise mercury with tin and obtaining gold (*vaṅgahātākā*) and the method to obtain tin that resembles the starry silver (*vaṅgatāra*). Deshpande 1992, pp. 121–8.

47 ‘Lunar tin’ refers to tin amalgamated with silver: literally, tin is amalgamated with the substance ‘having the aspect of the moon’ (*zla phyogs*). It could also refer to the substance being exposed to the moonlight.

48 *GBB* (Sde dge) 7r/6–7.

mercury. When [mercury] confronts fire and bubbles are taking shape, being immovable and stable, [it] is amalgamated with mica. When it becomes equal to gold and silver, [it] is employed for all the operations.<sup>49</sup>

On the microcosmic scale of the mineral world these operations reproduce a reassessment of the original pureness of the universe: metals and minerals correspond to the gross ‘five elements’ (*’byung ba lnga*)—earth, water, fire, air, and space—that constitute the entire universe (see Table 1). According to this pentagonal system, the element that is higher in the scale can emanate the successive element and reabsorb it, following a process of ‘dissolving impurities of the element’ (*’byung ba’i snyigs ma dengs*).<sup>50</sup> This is the reason why the process starts with black lead, which corresponds to the black earth and continues with tin, copper, silver, and gold, the essences of which will all be integrated into mercury. Anticipating the conclusive passage of the alchemical process, which results in the production of the elixir, the previous stanzas compare the compound to the ‘mature space’: this metaphor suggests the union of mercury with the eight metals and the two groups of minerals—in particular sulphur—and signifies the realisation of a perfect pure substance, which is considered the universal substratum of existence.<sup>51</sup>

TABLE 1 *The pentagonal system of the five elements and their corresponding metals*

|                 |       |       |        |        |       |
|-----------------|-------|-------|--------|--------|-------|
| <b>Elements</b> | Earth | Water | Fire   | Air    | Space |
| <b>Metals</b>   | Lead  | Tin   | Copper | Silver | Gold  |

49 *DGB* (Sde dge) 1r/7–2r/1–2.

50 The purification practice of the gross five elements that are transformed into lights is central to the *chülen* practices of breath and awareness, which are particularly relevant in many scriptures of the Tibetan Nyingmapa (Rnying ma pa) and Bön (Bon) traditions. For example, the Nyingmapa text called the *Penetration of the Sound* (*Sgra thal ’gyur*), handed down by Vimalamitra and collected by Lonchen Rabjam (Glong chen Rab byams, 1308–63), refers to this topic. See *Sgra thal ’gyur* (A ’dzom par ma), vol. 1, ff. 1r/1–103v. See also Walter 1992 on Jabir’s *chülen*.

51 The mercury sulphide compound is compared to the perfect ‘universal ground, the tint of which resembles the colour of the sky’ (*nam mkha’ mdog ’dra kun gzhi ma*) in several medical collections. See *Brang ti lha rje’i rim brgyud kyi man ngag gser bre chen mo* 148/2–4; *Man ngag bye ba ring bsrel pod chung rab ’byams gsal ba’i sgron me*, 785/4; Ridak 2003, p. 426.

The alchemical process is arranged in several phases as follows:

If it is not purified, it cannot be perfected. Without dyeing it in red, it will not transform the other substances into gold. Being dyed and purified, it will be perfected. It will perfect also the other innumerable substances.<sup>52</sup>

Mercury must be 'purged' (*sbyang ba*) of all the toxic components and has to be 'dyed in red' (*dmar por tso ba*) by cooking it with sulphur, 'vermillion' (*se 'du tsha*), and cinnabar, as well as plants of the 'red group' (*dmar po'i sde tshan*) that are listed later on in the *DGB*, in order to 'transmute the other substances [i.e. metals] into gold' (*rdzas rnams gser du byed pa*). The *GBB* refers to the transmutation of metals as 'penetration' (*'bigs par byed pa*), the translation of the Sanskrit *vedhana*. 'Penetration' means to achieve a concrete transformation of metals and not a superficial tinting. This is the *saṃskāra*<sup>53</sup> that according to Indian alchemy precedes the ingestion of mercury. According to the *GBB*, once mercury is 'mature' (*smin pa*) and pervaded by red components, it is deprived of adventitious 'impurities' (*snyig ma*). It is then 'solidified' (*rnyings pa*).<sup>54</sup> Copper 'benefits the maturation of mercury' (*dnagul chu'i smin pa la phen*),<sup>55</sup> because, as attested in the *DGB*, once purified, copper acts as a purifying agent tinging mercury bright red.<sup>56</sup> Before describing those operations to process mercury, the treatises focus on the preparation of eight metallic and eight mineral essences that mercury will absorb in order to become the perfect metal.

### Processing the Eight Metals and Obtaining Pure Silver

This section describes the 'eight metals' (*lcags brgyad*), their 'characteristics' (*mtshan ma*), the methods of their 'purification' (*sbyang ba*), their 'killing' (*bsad pa*),<sup>57</sup> the 'obtainment of their essences' (*bcud du byed pa*),<sup>58</sup> and their

52 *DGB* (Sde dge) 2r/4–5.

53 According to Indian alchemy, the *saṃskāras* are processing methods to perfect mercury.

54 *GBB* (Sde dge) 7v/2.

55 *GBB* (Sde dge) 7v/5.

56 *DGB* (Sde dge) 2v/4.

57 The word 'killing' here refers to the calcination of metals into ashes. Consequently, the alchemist can assimilate metals when they are taken in medical preparations. The process of 'killing' is a preliminary practice to obtain the metallic essences or seeds, which are to be absorbed by mercury.

58 The *GBB* refers to this phase as 'summoning' (*dgug pa*) their 'vital forces' (*snying thobs*); *GBB* (Sde dge) 8r/1–2.

'calcination' (*phyé mar bsreg pa*) by means of fire and various types of acid substance (*skyur po*). According to the *DGB*, the eight metals are 'supreme steel' (*mchog tu 'gyur ba rno lcags*) or, in case it is not available, 'steel' (*rno lcags*), as well as 'copper' (*zangs*), 'tin' (*gsha' tshe*), 'brass' (*ra gan*), 'lead' (*klu*, lit. 'snake'), 'purified copper' (*sbyang ba'i zangs*) or bronze, 'gold' (*gser*) and 'silver' (*ngul*). In the *GBB*, the metals are 'lustrous iron' (*'od ldan lcags*), 'steel' (*lcags rnon po*), 'brass' (*ra gan*), *zhoché* (*zho phyed*), 'tin' (*gsha' tshe*), 'copper' (*zangs*), 'Rāhu' (*sgra gcan*), 'gold' (*gser*), and 'the white' (*dkar po*). Undergoing a basic processing that is repeated seven times, metals are 'trituated' (*btags pa*) and processed with *batsa* (*ba tshwa*),<sup>59</sup> detoxified with five types of 'urine' (*dri chu*), then mixed with the powder of 'elephant's bones' (*glang po'i rus pa*), acid substances, and herbal extracts.

In detail, according to the *GBB*, the two types of iron (steel and iron) must be trituated in order to 'summon gold' (*gser ni dgug bcing*). They are purified with *batsa*, urine, and acid substances, and then calcined. Afterwards, they are mixed with the powder of 'monoliths of turquoise' (*mthing shing*), the powder of elephant bones, and goat's urine. Bronze undergoes the same process. Afterwards, bronze is boiled and macerated with acids. It is mixed with a little bit of lead in order to transmute it into copper. In the *DGB*, brass must be reduced into powder after being ground, roasted, and mixed with *batsa* and the five types of urine. Having repeated this process seven times, various types of vinegar must then be poured three times on the brass, which at that point will be purified. Bronze undergoes the same process. When lead is added, bronze will be transmuted into copper.<sup>60</sup> Both texts mention that gold is purified through being reduced to ash by adding types of vinegar, butter, and honey.<sup>61</sup>

59 *Batsa* is a type of salt identified as *humus nitrosus*. See Gawa Dorjé 1995, p. 89. A note on the identification of the *materia alchemica*, in particular plants: I am aware that it is problematic to find the correct botanical names, but I chose to identify them where possible, mainly using these sources: Dash 1994a and 1994b; Dawa 1999; Jampa Trinlé and Bod rang skyong ljongs sman rtsis khang (eds) 2006; Gawa Dorjé 1995; Karma Chöpel 1993; Sékhar Künga Tséring 1997; Trashy Serkhang 1997. Tibetan *materia medica* names appearing in Sanskritised form in the Tibetan text, are phoneticised here, followed by the Sanskrit term in parenthesis. Some of the minerals are only mentioned in their Sanskritised forms in the Tibetan texts; this explains the mix of Tibetan and Sanskrit terms given in these lists.

60 *DGB* (Sde dge) 3r/4–5.

61 *DGB* (Sde dge) 3v/1–2 and *GBB* (Sde dge), 8v/2–3.

The *DGB* and the *GBB* devote a long section to the procedure of obtaining pure silver. According to the *GBB*, silver is also called the ‘starry jasmine’ or *karma kunda* (*skar ma kun da*),<sup>62</sup> which when cut is white, oily, and characterised by the 64 signs of perfection. In order to obtain ‘pure silver’, the alchemist has to purify lead and tin. The reason for this is that tin and lead are considered two variants of the same metal and are distinguished as ‘white’ and ‘black’ snake spirits or *nāga* (*klu*). Lead has to be purified with ‘orpiment powder’ (*ba bla’i phye ma*) and aspersed with the red milky extract of *shrikenda* (*śrikhaṇḍa*).<sup>63</sup> Lead is dried in the sunlight and melted on fire until it is reduced to powder. This process, to be effective, is repeated seven times, and lead is aspersed with the juices of ‘the three fruits’.<sup>64</sup> Tin is purified in the same way. Subsequently, it is mixed with unprocessed *kunadi* (*kunaṭī*)<sup>65</sup> and the juice of the flower of *chang* (*chang*), and it is then gradually aspersed with the oil of *ōki lodrö* (*’od kyi blo sgros*)<sup>66</sup> and with the juice of *karandza* (*karañja*).<sup>67</sup> By adding a little bit of lead the ‘starry jasmine’ is obtained. Subsequently, it has to be burnt with urine seven times over fire.<sup>68</sup> The same process is described in the *DGB*, where it is mentioned as ‘the process to obtain the victorious [silver]’ (*rgyal ba byed pa*).<sup>69</sup>

62 According to the *DGB* and the *GBB*, the whitish *kunda* flower resembles the colour of silver; it is identified as *Jasminum multiflorum* by Dash 1994b, p. 440. This could be the Tibetan translation of *vaṅgatāra*. See note 46.

63 It is identified as *Toxicodendrum vernicifluum*. This lacquer tree is also called *sheshö* (*bse zho*). See Jampa Trinlé and Bod rang skyong ljongs sman rtsis khang (eds) 2006, p. 994 and Gawa Dorjé 1995, p. 158.

64 ‘The three fruits’ refer to the three myrobalans. This synonym appears in Tibetan medical sources early on; for example, in Vairocana’s medical dictionary. See *Cha lag bco brygad* 387/13.

65 The *DGB* confirms that *kunadi* corresponds to ‘realgar’ (*ldongs ros*), which in this case is unprocessed and aspersed with the extract of the *malati* (*mālatī*) flower. *DGB* (Sde dge) 5/7. According to Jampa Trinlé and Bod rang skyong ljongs sman rtsis khang (eds) 2006, p. 618, *mālatī* in Tibetan is *dzati* (*dza ti*), generally identified as nutmeg or *Myristica fragrans* Houtt. Gawa Dorjé 1995, p. 110.

66 Here, *ōki lodrö* refers to the Tibetan translation of the Sanskrit *jyotiṣmatī*, identified as *Celastrus paniculatus* by Dash 1994b, p. 237.

67 This refers to the *karañja* flower. Dash 1994b, p. 367.

68 *GBB* (Sde dge) 8r/6–7, 8v/1.

69 *DGB* (Sde dge) 3v/1. The term *gyelba* (*rgyal ba*) means victorious. It could correspond to the Sanskrit word *rajata*, meaning silver. See Monier-Williams 1960, p. 875.

### Processing the *Mahārasa* and *Uparasa*

The *materia alchemica* also includes the *mahārasa* (*bcud len*) and *uparasa* (*nyer bcud*), which the *GBB* calls ‘mercuries’ (*dnngul chu rnams*), and which are two groups of alchemical mineral agents (see Table 2). These two groups of minerals (or rocks that contain minerals) are involved in ‘purifying’ and ‘killing’ metals, as well as eliminating the poisonous components of mercury. Therefore, they are also called the ‘devourer elements’ (*za byed khams*). The *DGB* presents seven *mahārasa* and seven *uparasa*: the *mahārasa* are ‘chalcopyrite’ (*gser zil rdo*), ‘iron pyrite’ (*dri med rdo*), *thuthuka* (*tutthaka*) or ‘copper sulphate’, mercury, cinnabar, *masaka* (*mākṣika*)<sup>70</sup> or ‘copper pyrite’, and ‘the one which moves’ (*g.yo byed*)<sup>71</sup>; the *uparasa* are *kashika* (*kāśīsa*) or ‘iron-sulphate’,<sup>72</sup> yellow and white orpiment, realgar, sulphur, ‘acid rock’ (*skyyur po’i rdo*), ‘petals’ (*dab ma*),<sup>73</sup> and ‘hematite’ (*sbal rgyab rdo*).<sup>74</sup> Two additional minerals are listed in the *DGB*: the ‘red heart’ (*tsi ta dmar po*),<sup>75</sup> and a yellow substance called *kamkustra* (*kam kus tra*), which could be *kañkuṣṭha*.<sup>76</sup> The *DGB* also associates the use of mica and ‘zinc’ (*ti tsha*) with *kamkusri* (*kam ku sri*),<sup>77</sup> and specifies that white and yellow orpiment is used to process silver and gold. Moreover, chalcopyrite, which is the golden form of ‘copper pyrite’,<sup>78</sup> dries mercury along with steel.<sup>79</sup> The *GBB* lists six *mahārasa* and six *uparasa*: ‘sulphur’ (*mu zi*), ‘iron pyrite’ (*dri med*), *maksika* (*mākṣika*) or ‘copper pyrite’, ‘realgar’ (*kunaṭī*), *kashrika* (*kāśīsa*) or ‘iron sulphate’, and ‘cinnabar’ (*mtshal*) are the six *mahārasa*. The ‘orpiments’ (*ba bla rnams*),<sup>80</sup> the ‘supreme gold’ (*gser gyi*

70 This differs from the *GBB*, which gives *maksika* for *mākṣika*; see below.

71 This term is also a synonym for ‘wind’. In the *Kālacakra*, the *mahārasa capala* or bismuth is compared to the element ‘wind’ (*rlung*). See Fenner 1979, p. 153.

72 Dash 1986, p. 74.

73 It could refer to mica with its flake-like structure, in the texts called ‘petals’.

74 Gawa Dorjé 1995, p. 74.

75 Not identified. This could be menstrual blood or an unspecified mineral. *DGB* (Sde ge) 4r/2–3.

76 *DGB* (Sde dge) 4r/3. The identification of this mineral is controversial. However, many scholars refer to it as cassiterite or tinstone. See, for example, Ray 1991, pp. 134, 150.

77 Not identified.

78 *DGB* (Sde dge) 3v/6–7.

79 *DGB* (Sde dge) 6v/5.

80 According to the *GBB*, the orpiment has two variants: white and yellow, which are used to transmute mercury into silver and gold respectively. *GBB* (Sde dge) 7v/4.



*mchog*),<sup>81</sup> ‘mica’ (*lhang tsher*), *saubira* (*sauvīra*) or ‘antimony’, and *kamgushtra* (*kaṅkuṣṭha*) are the *uparasa*.<sup>82</sup>

TABLE 2 *The lists of mahārasa and uparasa and their identifications, according to three sources*<sup>83</sup>

| <i>mahārasa</i>                           | <i>DGB</i>   | <i>mahārasa</i>                        | <i>GBB</i>                                     | <i>Kālacakra Tantra</i>                                     |   |
|---|--|--|--|---|---|
|   | <i>uparasa</i>   |  | <i>uparasa</i>                                 | <i>mahārasa</i>   | <i>uparasa</i>  |
| chalcopyrite<br>( <i>gser zil rdo</i> )   | iron<br>sulphate<br>( <i>kāśīsa</i> )                                    | sulphur<br>( <i>mu zi</i> )            | yellow<br>orpiment<br>( <i>ba bla ser po</i> ) | copper pyrite<br>( <i>mākṣika</i> )<br>( <i>bsreg bya</i> ) | lapis lazuli<br>( <i>rājavarta</i> )<br>( <i>mthing</i> ) |
| iron pyrite<br>( <i>dri med rdo</i> )     | yellow<br>and white<br>orpiment<br>( <i>ba bla ser po dang dkar po</i> ) | iron<br>pyrite<br>( <i>dri med</i> )   | white<br>orpiment<br>( <i>ba bla dkar po</i> ) | iron pyrite<br>( <i>vimāla</i> )<br>( <i>bimāla</i> )       | mica<br>( <i>ābhraka</i> )<br>( <i>lhang tsher</i> )      |
| copper<br>sulphate<br>( <i>tutthaka</i> ) | realgar<br>( <i>ldongs ros</i> )   | copper<br>pyrite<br>( <i>mākṣika</i> ) | supreme<br>gold<br>( <i>gser gyi mchog</i> )   | cinnabar<br>( <i>dārada</i> )<br>( <i>mtshal</i> )          | ochre<br>( <i>gairika</i> )<br>( <i>btsag</i> )           |

81 According to the *GBB* (Snar thang) 4v/1, this is the golden ochre (*gser gyi btsag*).

82 When compared to the *Kālacakra Tantra* (see Table 2) we can note some correspondences with the above-mentioned lists of *mahārasa* and *uparasa*, either in number or constituents. The *Kālacakra Tantra* lists: ‘copper pyrite’ (*mākṣika*, *bsreg bya*), ‘iron pyrite’ (*vimāla*, *bimāla*), ‘cinnabar’ (*dārada*, *mtshal*), ‘hematite’ (*gairika*, *dnul rdo*) ‘copper sulphate’ (*sasyaka*, *zang rdo*), ‘bismuth’ (*capala*, *rdo khab len*), and ‘calamine’ (*ro can*) among the *mahārasa*; ‘lapis lazuli’ (*rājavarta*, *mthing*), ‘mica’ (*ābhraka*, *lhang tsher*), ‘ochre’ (*gairika*, *btsag*), ‘orpiment’ (*tālaka*, *ba bla*), ‘sulphur’ (*gandhaka*, *muzi*), ‘realgar’ (*manaḥśilā*, *ldong ros*) are listed among the *uparasa*. Fenner 1979, pp. 151–4.

83 The identifications from the *Kālacakra Tantra* are based on Fenner 1979, pp. 151–4. Identifications of substances mentioned in the *GBB* and *DGB* are from various sources. See footnote 52.

TABLE 2 (cont.)

| <i>mahārasa</i>   | <i>DGB</i>                                   |                                       | <i>GBB</i>   |   | <i>Kālacakra Tantra</i>                                 |                |
|---|--|---------------------------------------|--|---|---|----------------|
|   | <i>uparasa</i>                               |                                       | <i>mahārasa</i>  | <i>uparasa</i>  | <i>mahārasa</i>   | <i>uparasa</i> |
| mercury<br>( <i>dnḡul chu</i> )                                 | sulphur<br>( <i>mu zi</i> )                  | realgar<br>( <i>kunaṭī</i> )          | mica<br>( <i>lhang tsher</i> )                         | hematite<br>( <i>gairika</i> )<br>( <i>dnḡul rdo</i> )          | orpiment<br>( <i>tālaka</i> )<br>( <i>ba bla</i> )      |                |
| cinnabar<br>( <i>mtshal</i> )                                   | acid rock<br>( <i>skyr po'i rdo</i> )        | iron<br>sulphate<br>( <i>kāśīsa</i> ) | antimony<br>( <i>sauvīra</i> )                         | copper<br>sulphate<br>( <i>sasyaka</i> )<br>( <i>zang rdo</i> ) | sulphur<br>( <i>gandhaka</i> )<br>( <i>muzi</i> )       |                |
| copper pyrite<br>( <i>mākṣika</i> )                             | 'petals'<br>or mica (?)<br>( <i>dab ma</i> ) | cinnabar<br>( <i>mtshal</i> )         | tinstone or<br>cassiterite (?)<br>( <i>kankuṣṭha</i> ) | bismuth<br>( <i>capala</i> )<br>( <i>rdo khab len</i> )         | realgar<br>( <i>manaḥśilā</i> )<br>( <i>ldong ros</i> ) |                |
| 'the one which<br>moves'<br>( <i>g.yo byed</i> )<br>bismuth (?) | hematite<br>( <i>sbal rgyab rdo</i> )        |                                       |  | calamine<br>( <i>ro can</i> )                                   |   |                |

### Purification and Distillation of Mercury

The following processing techniques are based on the *DGB*; the *GBB* does not describe the purification of mercury but hinges on the preparation of metallic ashes. Therefore, the *GBB* will not be cited from this point onwards.

Purified mercury should be amalgamated with purified mica, which makes mercury capable of transmutation,<sup>84</sup> and subsequently with the essence of sulphur, chalcopyrite, cinnabar, and orpiment. Each of these must be calcined before being used in the main operations. Four kinds of mica are described: white mica is used for the processing of silver; among the three others—black, red, and yellow mica—the last one is considered superior. In the *DGB*, black and red mica play an important role in the transmutation of metals into gold.<sup>85</sup>

84 *DGB* (Sde dge) 4V/3.

85 *DGB* (Sde dge) 2V/1–3; 4V/3.

Purified with 'fish gallbladder' (*nya'i mkhris pa*), mica is reduced to petals and mixed with juices of *tankrulu* (*tan kru lu*).<sup>86</sup> Mica is then dried in the sunlight, washed, and mixed with the juice of *tiktik* (*tig tik*).<sup>87</sup> Mica is 'distilled' (*dag par byed pa*) in a vessel 'resembling an amulet box with a mouth' (*ga'u kha dang ldan*),<sup>88</sup> which is covered. Afterwards it is calcined and melted on a strong charcoal fire. The vessel remains sealed in order to calcine mica according to its iron nature.<sup>89</sup> The 'calcined mica' (*ābhrakasatva*) will be used to calcine other minerals. Golden pyrite or chalcopyrite is purified with *batsa* and vinegar, being triturated and reduced to ash in an iron vessel, which is covered and wrapped with cotton cloth. Afterwards, chalcopyrite is again processed like mica, using powdered acid substances; it is 'killed' with an 'iron stick' (*lcags kyi ber ga*) and is again macerated into vinegar.

Following the same method as in processing chalcopyrite, mercury is purified until it is reduced to globular lumps (*ri lu*). Afterwards, mercury is distilled. Here the *DGB* mentions the types of crucibles that are utilised to sublimate mercury. The apparatus for sublimation is known in Sanskrit as *pātana yantra* (*'khrul 'khor pa tang*); to be precise, in this case it is a *ūrdhva pātana yantra*, which operates with an upward directed evaporation.

Mercury, previously immersed in vinegar, is placed into an earthen pot that is closed with another superimposed one. Both are sealed by wrapping mud-smearred cloths around them. They are burnt with a fire underneath. Mercury will be condensed upwards on the (bottom) surface of the upper chamber, which is cooled by a cloth soaked in cold water. Finally, the 'remaining mercury will be dried' (*lhag ma'i dngul chu skam par 'gyur*) before collecting it from the crucible. According to the *DGB*, the alchemist is skilled in using the *pātana yantra*; he grinds the compound resulting from the sublimation described above and places it on a strata of chalcopyrite mixed with 'borax' (*tsha la*) and vinegar. All these substances are placed gradually inside an

86 In comparison, in the *DGB* (Snar thang) 380v/1, the term given is *tangtrulu* (*tang tru lu*), which could be the transcription of the Sanskrit word *tanḍulu* or *tanḍula*, which means raw rice. More likely, *tangtrulu* could correspond to the Sanskrit *tanḍulīya* or *Amaranthus spinosus* Linn, because the *DGB* (both Sde dge and Snar thang) refer to a medical root. Besides, the *tanḍulīya* is used to process purified and powdered mica (*dhānyābhraka*); see Dash and Kashyap 1994, p. 211.

87 *DGB* (Snar thang) 380v/3: *tig ta*, which is *Swertia chirayita* Buch-Ham. Gawa Dorjé 1995, p. 205.

88 This description refers to a round crucible made of two superimposed plates, without any orifice or mouth. Dash 1986, p. 212.

89 *DGB* (Sde dge) 4v/6–7 and 5r/1.

'amulet box without a mouth' (*ga'u kha med*). A fire is burnt on the strata of chalcopyrite so that a sublimate of mercury will be obtained underneath.<sup>90</sup>

The *DGB* describes the extraction of mercury from cinnabar and from orpiment. When mercury is extracted from cinnabar (triturated and mixed with acidic juice and *pa ta ka*),<sup>91</sup> it will penetrate metals with the aim to convert them into gold. In order to transform metals into silver, orpiment is used. Orpiment is mixed with fish gallbladder and borax, and is calcined into an iron vessel 'without mouth' until it is transformed into white pure silver. What follows is the core part of the treatise, describing the mercurial elixir through which the alchemist can realise 'physical accomplishments' (*lus dang don 'grub pa*) and 'spiritual and karmic accomplishments' (*chos dang las don 'grub pa*) by ingesting the supreme and 'immovable mercury' (*mi g.yo ba'i dngul chu*), 'which cannot be bestowed on ordinary persons' (*phal pa rnams la mi sbyin no*).

### Macerating and Cooking Mercury

At this point, mercury is triturated with 'brick powder' (*so phag phye ma*), 'black mustard seeds' (*ske tshe*), the three salts,<sup>92</sup> the 'fragrance of the roof' (*kham pa'i steng du ngad*),<sup>93</sup> and eleven unspecified substances, as well as brass. Besides, mercury must be macerated in a series of herb extracts. These plants, whose identification is controversial, could belong to a particular class of plants classified as 'celestial drugs' (*divyāsusaḍhi*) because of their intimate connection with divine sexual essences. According to the *DGB*, two groups of medicines are considered to be 'powerful medicines' (*stob chen sman rnams*) and are prescribed in 'the method to bind or fix mercury' (*dngul chu 'ching ba'i cho ga*).

The first group, known as the 'most precious medicines' (*mchog tu gces pa'i sman rnams*), includes: 'Brahma's stick' (*tshangs pa'i dbyug pa, brahmadanḍa*), 'Brahma's moon' (*tshangs pa'i zla ba, brahmacandra*), 'the snake-eyed mingchen' (*sbrul gi mig gi ming can*),<sup>94</sup> 'yellow solar eye' (*ser po ny'i mig*),

90 *DGB* (Sde dge) 5r/1–4.

91 This material is not identifiable.

92 Not specified. Maybe the three processed salts; see the list on the next page.

93 *Gr̥hadhūma* or *dhudhumāra*, which is soot. Dash 1986, p. 59.

94 It is also known as 'snake's eye'. There are two variants of the plant called *mingchen*, which are *Pulicaria insignis*. Gawa Dorjé 1995, p. 261. For the yellow variant, see Jampa Trinlé and Bod rang skyong ljongs sman rtsis khang (eds) 2006, pp. 631–2.

'cuckoo's root' (*khu byug rtsa ba*),<sup>95</sup> *mandhuparni* (*maṇḍūkapaṇī*),<sup>96</sup> 'filth petal' (*'dab ma sha lin tshi*),<sup>97</sup> 'powerful medicine' (*stobs po che'i sman*),<sup>98</sup> 'shy flower' (*me tog ngo tsa can*),<sup>99</sup> and 'lunar creeper' (*zla ba'i khri shing*),<sup>100</sup> which is 'a medicine that dries the water' (*chu skems par byed pa'i sman*) and is used in all the processing methods.

The second group are medicines that are used for the 'operation to transform into silver' (*dngrul gyi las rnams byed*). These include 'clotted-hair ghost with big petals' (*'byung po 'dab ma ral pa can*),<sup>101</sup> 'intellect tree of inferior quality' (*jo ti sma ti sma bo gcig*),<sup>102</sup> 'milk of *hatrakhubi*' (*ha tra khu bi'i o ma*),<sup>103</sup> 'camel' (*rnga mo*),<sup>104</sup> *tserma* (*tsher ma*),<sup>105</sup> 'bright peacock's crest' (*rma bya'i gtsug phud 'od ldan*),<sup>106</sup> 'red that expels' (*skrod byed dmar po*),<sup>107</sup> 'nāga's force' (*klu stobs*),<sup>108</sup> and 'evil body' (*lus ngan po*),<sup>109</sup> which is 'said to be the most important' (*mchog tu brjod*) among them. All these substances are distilled with vinegars and mixed with a mineral called *rakdo* (*rag rdo*), dried in the sun, and triturated. Mercury is macerated in a liquid substance obtained from the extracts of those medicines, mixed with vinegar, ghee, and various types of milk; it is finally dried on fire. This fermenting liquid, which seems to include herbs, vinegar, ghee, but also sulphur, lead, as well as other not precisely identified substances, has the double function of fixing but also drying mercury, which consequently loses its motility and cannot evaporate. In the *DGB*, the following substances are also prepared and distilled with vinegar according to

95 It has not been identified.

96 *Centella asiatica* Linn. Dash and Kashyap 1980, p. 326.

97 It has not been identified.

98 Notably, this substance has the same name as the entire group.

99 This could be *Mimosa pudica* Linn (*lajjālu*); see Dash and Kashyap 1980, pp. 58, 459.

100 This plant is often identified with the *Ephedra Gerardiana* Wall, which in Sanskrit is *somalāta*. See Flattery and Schwartz 1989, pp. 69–70.

101 This could be the Tibetan translation of *bhūtakesī*, which, according to Todarāṇḍana, corresponds to the blue variety of *Nirgundi*. Dash and Kashyap 1980, p. 467.

102 This is *Celastrus paniculatus* Willd. (*jotiṣmatī*); see Dash 1994b, pp. 237, 618.

103 It has not been identified.

104 According to Gawa Dorjé 1995, p. 254, this plant is *Thlaspi arvense* L. It could also refer to camel's milk, which is often used in these operations. See Dash 1986, p. 180.

105 This is *Meconopsis horridula* (*tsher sngon*). Gawa Dorjé 1995, pp. 268–9.

106 Peacock's crest is also a secondary name of sulphur. See Sékhar Künga Tséring 1997, p. 167 and Jampa Trinlé and Bod rang skyong ljongs sman rtsis khang (eds) 2006, p. 653.

107 It has not been identified.

108 It could be the *nāgabalā*, which corresponds to *Grewia populifolia* Vahl. Dash and Kashyap 1980, p. 46.

109 I proposed its identification with lead at the beginning of the paper.

'the method of acid' (*skyur po'i cho ga*): 'māni's petals' (*mA ni'i 'dab ma*), 'tree of the water goddess' (*chu lha'i shing*),<sup>110</sup> *nirkundri* (*nirguṇḍī*),<sup>111</sup> *maharasatri*,<sup>112</sup> *shatri* (*śatā* or *śatāvaharī*),<sup>113</sup> *ghanihari*,<sup>114</sup> 'Brahma's stick' (*tshangs pa'i dbyug pa, brahmadanḍa*), *dhadura* (*dhattūra*),<sup>115</sup> 'poison' (*dug*), *tsitraka* (*tsi tra ka*),<sup>116</sup> *cibik* (*lci 'bigs*), and *yungnak* (*yung nag*).

The above-mentioned plants and minerals are listed along with salts, types of urine, and herbs used to cook mercury, *mahārasa* and *uparasa*, following a standard pattern found in many Indian alchemical treatises. This pattern is characterised by certain categories that involve the entire *materia alchemica* of the *DGB*. All the following substances will be cooked with mercury:

- 'Subsidiary poisons' (*nye ba'i dug*): *langkali* (*lāṅgālī*), white *karbir*,<sup>117</sup> *nishikru* (*ni shi kru*), and 'the one which leads to madness' (*myos byed ba*);
- 'Five principal poisons' (*dug chen lnga*): *sathuba* (*śāktuka*),<sup>118</sup> *sringiba* (*śrīṅgika*),<sup>119</sup> *kalakupta* (*kālakūṭa*),<sup>120</sup> *serkya* (*ser skya*),<sup>121</sup> and 'the poison that resembles yellow honey' (*sbrang rtsi ser po lta ba'i dug*);<sup>122</sup>

110 According to Das 1998, p. 421 this is *Crataeva roxburghii*. This could be a synonym of *vāruṇa*, which is identified as *Crataeva nurvala* Buch.-Ham by Dash 1994b, p. 201.

111 According to Dash 1994b, p. 256, this is *Vitex negundo*.

112 The Sanskrit equivalent has not been identified.

113 See Monier-Williams 1960, p. 801, and also p. 1051, where we find *śatru* as *Asparagus racemosus* L. In my opinion, *shatri* could be *Asparagus racemosus* L., which according to Dash 1986, p. 56, who mentions *śatāvaharī*, is used to prepare a kind of vinegar for processing mercury.

114 The Sanskrit equivalent has not been identified.

115 According to Gawa Dorjé 1995, p. 216, this is *Datura stramonium* L.

116 According to Gawa Dorjé 1995, p. 149, this is the *Capsicum frutescens* L.

117 According to the Snar thang version of the Tengyur, this is *kabhira*. *DGB* (Snar thang) 382r/3. This could be the transcription of *karavīra* or *Nerium odorum*. Monier-Williams 1960, p. 291.

118 It has not been identified.

119 *Śrīṅgi*, *śrīṅgika*, or *kartakaśrīṅgi*. According to Dash and Kashyap 1980, p. 65, it corresponds to *Pistacia integerrima* Steud ex Brandis.

120 This is also called *hālahala*. The botanical name of this poisonous plant is *Aconitum ferox* and the Tibetan refers to 'black aconite' (*bong nga nag po*). Dawa 1999, p. 50.

121 According to Sékhar Künga Tséring 1997, p. 245, *serkya* is a secondary name of *agaru* (*a ga ru*), which is *Aquilaria sinensis*. Gawa Dorjé 1995, p. 164.

122 Gawa Dorjé 1995, p. 245, identifies it as *Aconitum kongboense* Lauener.

- **Salts** (*tsha*): ‘sea salt’ (*rgya mtsho’i tsha*), *sedhaba* (*saindhava*),<sup>123</sup> ‘sea salt’ (*rgyam tsha*),<sup>124</sup> ‘salt used to cook’ (*btso tsha*), ‘ammonium chloride’ (*rgya tsha*),<sup>125</sup> and ‘excrement’ (*dri chen*);<sup>126</sup>
- **‘The three that bring about change’** (*gyur byed rnam gsum*): ‘borax’ (*tsha la*),<sup>127</sup> *tsur* (*mtshur*),<sup>128</sup> and ‘nitrum’ (*ze tsha*);<sup>129</sup>
- **Other substances containing salts**: a type of ‘wood containing *batsa*’ (*ba tsha can gyi shing*), *palasha* (*palāśa*),<sup>130</sup> *apamarkahi tsala* (*a pa mar ka hi, tsha la*),<sup>131</sup> ‘the trunk of long pepper’ (*pi pi ling gi sdong bu*), and ‘the three that bring about change’ (*gyur byed gsum*);<sup>132</sup>
- **‘Three types of urine’** (*dri chu rnam gsum*): cow’s urine, elephant’s urine, and camel’s urine;
- **‘Red substances’** (*dmar po’i sde tshan*) used to ‘cook’ (*btso*) silver: ‘ginger’ (*sga*), *kabuka* (*ka sbu ka*),<sup>133</sup> *tsitraka*, ‘tumeric’ (*yung ba*),<sup>134</sup> *tsöd* (*btsod*),<sup>135</sup> ‘red sandalwood’ (*raktacandana*),<sup>136</sup> *patamka* (*pataṅga*),<sup>137</sup> *kusumbha* (*kusumbhalā*),<sup>138</sup> and ‘silver petal’ (*’dab ma’i dngul*);

123 Rock salt. See Dash 1986, p. 154.

124 *Sallucidum*. Gawa Dorjé 1995, p. 87.

125 Also, *Sal ammoniacum*. Gawa Dorjé 1995, p. 86.

126 *Ibid.*, p. 156.

127 *Ibid.*, p. 92. Pasang Yonten 1998, p. 203.

128 This is a secondary name of *Friboferitum* (*nag tshur ser thur*), a green-red salt also known as *kala namak*. Gawa Dorjé 1995, pp. 88–9.

129 *Ibid.*, p. 94.

130 *Butea monosperma*. *Ibid.*, p. 146.

131 Probably this word stands for the Sanskrit *apāmārga* or *Achyranthes aspera* Linn. Dash 1986, p. 179. See also Dash and Kashyap 1982, p. 260.

132 In the *DGB* there is no technical term for this group of substances, but all of them contain salts. Dash classifies some of these under the category of alkalies (*kṣāra*). Dash 1986, p. 179.

133 This could be *kakubha* or *Terminalia arjuna*. See Monier-Williams 1960, p. 241. According to Dash 1986, p. 77, *kakubha* is used for dyeing mercury.

134 Identified as *Curcuma longa* by Gawa Dorjé 1995, p. 192.

135 This corresponds to *Rubia cordifolia* according to Gawa Dorjé 1995, p. 150.

136 This is the secondary name of *gurgum* (*gur gum*) or *Crocus sativus*, also called *dapma lüchen* (*’dab ma lus can*). See Jampa Trinlé and Bod rang skyong ljongs sman rtsis khang (eds) 2006, p. 388. It is also identified as *Pterocarpus santalinus* (*raktacandana*), red sandal, or *raktasāra* by Monier-Williams 1960, pp. 861–2.

137 According to Dash 1994b, p. 556, this could be the ‘grasshopper’ (*bye ma* or *bye’u*). Sékhar Künga Tséring 1997, p. 177, identifies it as *gurgum*.

138 This is another name for *gurgum*. Sékhar Künga Tséring 1997, p. 30. See also Monier-Williams 1960, p. 298. According to Dash 1986, p. 181, this is *Carthamus tinctorius* Linn.

- ‘Three juices’ (*khu ba gsum*): the extract of *dzoti mati* (*dzo ti sma ti*), of *karañja*,<sup>139</sup> and of *atashi* (*ataṣī*).<sup>140</sup>

The *DGB* continues describing the ‘cooking phase’ of mercury with all the above-mentioned substances, in particular the ‘red group’ and the ‘three juices’. The red plants are the vegetal substitutes of menstrual blood, which represent the catalysing substances *par excellence*. They are used for cooking silver, while the three juices representing ‘semen’ (*khu ba*) are utilised to cook mercury. Being dried in the sunlight with the *bhesha* (*viṣa*)<sup>141</sup> plant and aspersed with the juice of lotus petals, mercury is cooked again being immersed in or, to be precise, being ‘suspended’ (*bar snang*) into a bath of ‘asafoetida’ (*shing kun*),<sup>142</sup> powdered shell, and the primary and secondary salts, vermilion (*sindūra*), urine, the group of the ‘most precious medicine’ (*mchog tu gces pa'i sman*), ‘rock salt’ (*saindhava*), and acid. The *DGB* continues describing the cooking process through the union of mercury with mica, vermilion, and cinnabar as follows:

On the petal of the *mandhuka* (*maṇḍūka*),<sup>143</sup> the viscous juice is poured and cooked. This is the device of the burning fire that dispels the impurities. According to the device of the curing goose,<sup>144</sup> mica must be poured. Add vermilion and cinnabar, pour them into the copper vessel; this is the device without orifices. According to the extremely gentle device, day after day, add the pale yellow poison and agar.<sup>145</sup>

As seen before, mercury has to be amalgamated with mica in order to penetrate and absorb metals. The *DGB* refers to the union of mercury with the flakes-releasing black mica, which is called *maṇḍūka* or ‘frog’, alluding to sexual intercourse, a union that is established through a strong fire. In the second case, yellow mica is compared to the goose because of its association with the

139 *Pongamia pinnata*. Dash 1994b, p. 367.

140 It could be *Linum usitatissimum*, a synonym of *umā*, which is enumerated among the oily substances (*taila*) used to process mercury. See Dash 1986, p. 181.

141 *Bhesha* could be the transcription of *viṣa* or aconite. See Dash 1986, pp. 82, 168.

142 This is *Ferula asafoetida*. See Gawa Dorjé 1995, p. 156 and Sékhar Künga Tséring 1997, p. 235.

143 In the *DGB*, it is spelled *madhuka*. *DGB* (Sde dge) 6v/1.

144 In the Snar thang edition of the *Tengyur*, the term ‘mature’ (*smin pa*) is used, see *DGB* (Snar thang) 382v/3. The Sde dge edition mentions the term ‘doctor’ (*sman pa*) instead, which seems to be a copying error, see *DGB* (Sde dge) 6v/2.

145 *DGB* (Sde dge) 6v/1–3.



element space and breath. Mercury itself, being volatile, is associated with this ethereal bird.<sup>146</sup> However, at this stage of the process, mercury is ‘mature’, possessing a stable space-like nature as described in the incipits. Vermillion and cinnabar, which are generally associated with divine menstrual blood, catalyse mercury. Besides, mercury must be gradually treated with acid and *agar*.

### Making Gold and the Mercurial Elixir

Having assimilated mica and having been treated with catalysing substances, mercury assimilates the metallic essences. According to the text, mercury is exsiccated, becoming black like a crow. Most probably, it refers to its union with sulphur and acidic substances. At this point, the alchemist should add the metals that ‘devour’ mercury. In the end, mercury is white and can absorb all the metallic essences. Here, the word ‘white’ can be interpreted in different ways: it could indicate that at this point of the process liquid mercury, which is silvery white, is added, but it could also indicate that mercury, being white, can take on the colours and nature of other metals. It could be the ‘mature space’, as the *DGB* describes:

Once exsiccated as the pernicious crow<sup>147</sup> [by adding] the medicine[s] used for the practice of dehydration that has been described before, mercury is been transformed sixteen times.<sup>148</sup> Add the tamed metals. They all devour mercury. In the end, add white mercury; they all become one.<sup>149</sup>

Being amalgamated with the lesser six metals, mercury is aspersed with the ‘precious seed’ (*rin chen sa bon*). It refers most probably to the essences of gold and silver. According to the incipits, when mercury absorbs silver and gold, it acquires not only their colour but also their nature:

The six metals are amalgamated. Chalcopyrite completes the operation. It completes the supreme operation. Pour the precious seed. This

146 See White 1996, pp. 209–13.

147 *DGB* (Snar thang) 382v/4: *bdug pa*, which means ‘to burn incense’. According to the *Vimalaprabhā* (Sde dge), vol. 102, 79v/7, the ‘black agarwood’ (*a ga ru nag po*) used for preparing incense is called ‘crow’ (*bya rog*).

148 Here mercury is associated with the moon, and the number 16 refers to the symbolism of the ‘lunar digits’ (*kāla*). For details on this symbolism, see White 1996, pp. 36–45.

149 *DGB* (Sde dge) 6v/3–4.

transforms half of [mercury] into gold. Added twice, [mercury] becomes white. Again, add two parts of silver to the killed iron, and mercury is perfected. Dried as gold, it realises all purposes.<sup>150</sup>

Here mercury is dried until it assumes the appearance of gold (*gser 'gyur ltar bskam par gyur ba*); this alchemical gold can realise all purposes (*kun kyi don rnam 'grub par 'gyur*). This passage resembles the last part of the *GBB*, where the starry jasmine is dried on fire until it is completely purified.

The 'perfected mercury' (*dnngul chu grub pa*) is utilised to 'penetrate' (*'phigs par byed pa*) metals innumerable times until it 'will become the elixir' (*bcud kyi len 'grub par byed*). At this point, the alchemist can ingest mercury in order to cure diseases such as leprosy, prolong his lifespan, and obtain youth.

### Conclusions

In the two Tibetan treatises on iatrochemistry from the *Tengyur* that were discussed in this article, the connection between alchemy and medicine conforms to the syncretic model of the categories of knowledge found in the Indian Buddhist tantric system, according to which philosophy, empirical sciences, and magico-religious healing methods are interrelated.<sup>151</sup> In these two treatises, alchemy is closely interlinked with medicine, because alchemically prepared mercury not only rejuvenates the alchemist and prolongs his lifespan, but also cures mundane physical diseases.

The two treatises provide a very long and detailed description of the methods to process mercury along with other metals, minerals, and plants. Although the medical and the alchemical uses of mercury are mentioned in Tibetan literature predating these two treatises, to my knowledge, these are the earliest and most detailed descriptions on complex mercury processing techniques aiming at making an elixir for both rejuvenating and therapeutic purposes. These techniques were further developed into the processing of detoxified mercury sulphide ash, known as *tsotel* (*btso thal*), which became prominent in later Tibetan pharmacology texts during the fourteenth to nineteenth centuries in Tibet, comprising the base material for 'precious pills' (*rin chen ril bu*), popular to this day.<sup>152</sup> The *GGB* and *DGB* contributed to the

150 *DGB* (Sde dge) 6v/5–6.

151 Wallace 2009, pp. 277–300.

152 See Gerke, this issue.

consolidation of these Tibetan pharmacological traditions and its subsequent refined remedies.<sup>153</sup>

Orgyenpa not only translated the *GBB* and *DGB* but also transmitted his own teachings on mercury that are preserved in numerous medical collections.<sup>154</sup> Orgyenpa principally classified mercury processing into three phases: (1) the 'elimination of oxides' (*g.ya' phyi dang g.ya' khu 'don*), (2) the 'cooking to eliminate perforating substances' (*lce 'bigs btso bkru*), and (3) the 'confrontation and transformation' (*drag dang phral nas gzugs su bsgryur ba*) achieved by mixing mercury with sulphur and other metals and minerals.<sup>155</sup> Combined, these three phases comprise the famous 'great purification of mercury' (*btso bkru chen mo*), the making of *tsotel*.

Similarly, though not as clearly structured, in the *DGB* and the *GBB* all operations are arranged into three phases: preliminary purification, cooking, and the successive union of mercury with metallic essences. Nevertheless, it is clear that the *DGB* largely conforms to the 18 canonical *samskāras* of Indian alchemy. Further research could analyse how exactly the three phases in the *DGB* and *GBB* compare to the three phases in Orgyenpa's instructions, and also to processing techniques in the *Subsequent Tantra* of the *Gyūshi*, where the 'elimination of oxides' is already described; the latter could have been one important source for Orgyenpa's three-folded process. Such analyses could throw some light on the influence that the techniques mentioned in the *DGB* and the *GBB* had on later mercury processing practices, especially the making of *tsotel*. Even if we do not know anything about the actual use of the *DGB* and the *GBB* at the time of their entry into the Tibetan literature corpus, it might be possible to detect their influence on later Tibetan mercury-based pharmaceutical practices through a comparative analysis of the three-phase descriptions of mercury processing in the canonical, earlier, and later Tibetan medical texts.

The entire mercury processing is not just a metaphor concealing exclusively a religious or spiritual practice, but the texts concretely describe iatrochemical operations while emphasising both the worldly and spiritual attainments and powers achieved by the elixir. The *DGB* describes how to obtain the 'starry jasmine silver' from lead and tin as well as the 'alchemical gold', which is processed mercury. It has absorbed metal and mineral essences and is able to perfect not only other metals but also the human body. Thus, both the treatises refer to the obtainment of some form of physical perfection or immortality as

153 See Czaja, this issue.

154 Some are mentioned by Czaja, this issue.

155 See 'Brong rtse be'u bum dkar mo man ngag gi bang mdzod 257/1–304/14; Brang ti lha rje'i rim brgyud kyi man ngag gser bre chen mo, 145/8–148/14.

a result of ingesting the mercurial elixir. However, this elixir can be achieved and consumed only by those who can master it because of their own spiritual capacities. The *DGB* alludes to this kind of spiritual perfection, but does not describe any specific spiritual practice related to it. Apart from the spiritual aims, the specific kind of alchemy portrayed by the *GBB* and *DGB* has clearly a temporal medical aim: the curing of diseases.

One may ask the question how the two treatises link up with the standard Tibetan classification of 'external' and 'internal' alchemical practices, where the preparation of elixirs pertains to 'external alchemy' (*phy'i bcud len*), which is considered to assist the alchemist in the meditative, yogic, and sexual practices of the 'internal alchemy' (*nang gi bcud len*). This distinction reflects the developments of alchemy in diverse Indian tantric traditions, including various yogic, meditational, and transmutational practices ascribed to different groups of medieval *siddhas*.<sup>156</sup> In the Buddhist tantric context, this distinction assumes a hierarchical significance. The *Kālacakra Tantra* embodies the epistemological paradigms and the methods of Indian Buddhist tantric medicine and alchemy at their apogee, where the use of mercury and metals is prescribed for those who have not yet mastered the supreme erotico-mystical practices (breath control and semen retention) of 'internal alchemy' and aim at physical rejuvenation and longevity through 'external alchemy'. This aim is also linked to the making of gold, which is, however, considered an inferior achievement.<sup>157</sup>

Based on my current research of the texts, I think that the *GBB* and *DGB* interweave both 'external' and 'internal' alchemical methods, even though the texts give prominence to 'external' methods emphasising practical techniques in the preparation of the elixir, especially in the *GBB*, which is mainly devoted to the preparation of metallic essences (*snying stobs*) resulting from purification and calcination of the eight metals. It is, of course, possible that the instructions on the internal methods were kept secret, being taught orally and exclusively to selected practitioners; we do not know. However, it is clear that spiritual practices performed by the alchemist play out especially in the *DGB*, where the production of an elixir is linked to the gold-making process as a kind of *rasāyana* that can be consumed and substitutes ordinary food in order to obtain a perfected body, untouchable by diseases, ageing, and death. It is noteworthy that this kind of elixir, as asserted by the *DGB*, 'cannot be bestowed on ordinary persons' (*phal pa rnams la mi sbyin no*), implicating that only the

156 White 1996 and Samuel 2010.

157 *Kālacakra Tantra*, Tōh 375 *Bka' gyur* (Lha sa), vol. 79 (*rgyud, ka*), ff. 73r/6–73v/7, and *Vimalaprabhā*, Tōh 114, *Bka' gyur* (Sde dge par phud), vol. 102 (*rgyud, srī*), ff. 78v/3–79v/5.

expert tantric practitioner, who has obtained certain realisations, can assume it in order to perfect his body. In this way, it does not differ significantly from the methodology presented in the *Kālacakra Tantra*. However, in the *DGB* the spiritual level of the practice remains in the background. I think that their emphasis on 'external' alchemy, i.e. pharmacological techniques and therapeutic applications, played a role in both treatises being included into the 'arts and crafts section' and the 'miscellaneous section' of the Tibetan Buddhist Canon.

## Bibliography

### Primary Sources

*Bi cī'pu ti kha ser*

Biji Tsempashilaha (Bi ci Tsan pa shi la ha), *Bi cī'pu ti kha ser*, Lha sa: Bod ljongs mi dmangs dpe skrun khang, 2005.

*Brang ti lha rje'i rim brgyud kyi man ngag gser bre chen mo*

Penden Gyeltsen (Dpal ldan rgyal mtshan), *Brang ti lha rje'i rim brgyud kyi man ngag gser bre chen mo*, Lha sa: Bod ljongs mi dmangs dpe skrun khang, 2005.

*'Brong rtse be'u bum dkar mo man ngag gi bang mdzod*

Latsün Rinchen Gyatso (Lha btsun Rin chen rgya mtsho), *'Brong rtse be'u bum dkar mo man ngag gi bang mdzod*, Pe cin: Mi rigs dpe skrun khang, 2005; MS TBRC W1PD2.<sup>158</sup>

*'Bum khu tshur*

Bharo Chakdum (Bha ro phyag rdum), *'Bum khu tshur*, Pe cin: Mi rigs dpe skrun khang, 2006; MS TBRC W1PD5.

*Cha lag bco brgyad*

Yutok Yönten Gönpo (G.yu thog Yon tan mgon po), *Cha lag bco brgyad*, Pe cin: Mi rigs dpe skrun khang, 2005; MS TBRC W1GS11.

*Deb gter sngon po*

Gö lo Shon Nupel ('Gos lo Gzhon nu dpal), *Deb gter sngon po*, Cheng du: Si kron mi rigs dpe skrun khang, 1984.

---

158 This number refers to the digitised manuscripts at the Tibetan Buddhist Research Centre. URL: <[www.tbrc.org](http://www.tbrc.org)>.

*DGB* (Pe cin) *Dngul chu grub pa'i bstan bcos*

Balipa (Bha li pa), Orgyenpa Rinchenpel (O rgyan pa rin chen dpal) and Sri Narendabadra (transl.), *Rasasiddhiśāstra* (*Dngul chu grub pa'i bstan bcos*) in *Bstan 'gyur* (Pe cin), Pe cin: Krung go'i bod rig pa'i dpe skrun khang 1994–2008; MS TBRC W1PD95844.

*DGB* (Sde dge) *Dngul chu grub pa'i bstan bcos*

Balipa (Bha li pa), Orgyenpa Rinchenpel (O rgyan pa Rin chen dpal) and Sri Narendabadra (transl.), *Rasasiddhiśāstra* (*Dngul chu grub pa'i bstan bcos*), in *Bstan'gyur* (Sde dge blocks), Delhi: Delhi Karmapae Chodhey, Gyalwae Sungrab Partun Khang, 1982–5; MS TBRC W23703.

*DGB* (Snar thang) *Dngul chu grub pa'i bstan bcos*

Balipa (Bha li pa), Orgyenpa Rinchenpel (O rgyan pa Rin chen dpal) and Sri Narendabadra (transl.), *Rasasiddhiśāstra* (*Dngul chu grub pa'i bstan bcos*), in *Bstan'gyur* (Snar thang), Snar Thang: Snar thang par khang 1800(?) Block Print; MS TBRC W22704.

*Dhātuvāda* (*Gser gyur gyi rtsi*)

Lopön Nali (Slop dpon Na li), *Dhātuvāda* (*Gser gyur gyi rtsi*), in *Bka' gyur* (Sde dge blocks), Delhi: Delhi Karmapae Chodhey, Gyalwae Sungrab Partun Khang, 1982–5; MS TBRC W23703.

*GBB* (Pe cin) *Gser 'gyur bstan bcos bsdus pa*

Balipa (Bha li pa), Orgyenpa Rinchenpel (O rgyan pa rin chen dpal) (transl.), *Rasaśastroḍḍhṛti* (*Gser 'gyur bstan bcos bsdus pa*), in *Bstan 'gyur* (Pe cin), Pe cin: Krung go'i bod rig pa'i dpe skrun khang 1994–2008; MS TBRC W1PD95844.

*GBB* (Sde dge) *Gser 'gyur bstan bcos bsdus pa*

Balipa (Bha li pa), Orgyenpa Rinchenpel (O rgyan par in chen dpal) (transl.), *Rasaśastroḍḍhṛti* (*Gser 'gyur bstan bcos bsdus pa*), in *Bstan 'gyur* (Sde dge blocks), Delhi: Delhi Karmapae Chodhey, Gyalwae Sungrab Partun Khang 1982–5; MS TBRC W23703.

*GBB* (Snar thang) *Gser 'gyur bstan bcos bsdus pa*

Balipa (Bha li pa), Orgyenpa Rinchenpel (O rgyan par in chen dpal) (transl.), *Rasaśastroḍḍhṛti* (*Gser 'gyur bstan bcos bsdus pa*), in *Bstan 'gyur* (Snar thang) Snar thang: Snar thang par khang 1880(?) Block Print; MS TBRC W22704.

*Grub chen o rgyan pa'i nram par thar pa byin brlabs kyi chu rgyun*

Sönäm Özer (Bsod nams 'od zer) and Dawa Sengé (Zla ba seng+ge), *Grub chen o rgyan pa'i nram par thar pa byin brlabs kyi chu rgyun*, Gantok: Sherab Gyaltzen Lama 1976; MS TBRC W23940.

*Gyüshi (Rgyud bzhi)*

Yutok Yönten Gönpö (G.yu thog Yon tan mgon po), *Bdud rtsi snying po yan lag brgyad pa gsang ba man ngag gi rgyud. A Reproduction of a Set of Prints from the 1888 Lha-sa Lcags-po-ri Blocks*, Leh: T. S. Tashigangpa, 1978.

*Kālacakra Tantra*

*Paramādibuddhoddṛtaśrīkālacakranāmatantrarāja (Mchog gi dang po'i sangs rgyas las byung ba rgyud kyi rgyal po dpal dus kyi 'khor lo)*, in *Bka' 'gyur* (Lha sa), Lha sa: Zhol bka' 'gyur par khang, 1934; MS TBRC W26071.

*Man ngag bye ba ring bsrel pod chung rab 'byams gsal ba'i sgron me*

Zurkharba Nyamnyi Dorjé (Zur mkhar ba Mnyam nyid rdo rje), *Man ngag bye ba ring bsrel pod chung rab 'byams gsal ba'i sgron me*, Lan kru'u: Kan su'u mi rigs dpe skrun khang, 1993.

*Rin chen gter mdzod*

Jamgön Kongtrül Lodrö Thaye ('Jam mgon kong sprul blo gros mtha' yas) and Jamyang Khyentse Wangpo ('Jam dbyangs mkhyen brtse'i dbang po), *Rin chen gter mdzod*, Pa ro: Stod lung mtshur phu'i par khang, 1980.

*Sgra thal 'gyur*

Vimalamitra (Bi ma la mi tra), *Rin po che 'byung par byed pa sgra thal 'gyur chen po'i rgyud*, in *Rnying ma'i rgyud bcu bdun* (A'dzom phar ma), Dkar mdzed bod rigs rang skyong khul, Dpal yul rdzong: A'dzom chos gar, 2000 (?); MS TBRC W1KG11703.

*Slob dpon pad 'byung gi sman yig gces btus*

Lopön Péma Jungné (Slob dpon Pad ma 'byung nas), *Slob dpon pad 'byung gi sman yig gces btus*, Pe cin: Mi rigs dpe skrun khang, 2005.

*Sman dpyad zla ba'i rgyal po*

Nāgārjuna (?), Hashang Ma hā ya na and Vairocana (Bai ro tsa na) (transl.), *Sman dpyad zla ba'i rgyal po*, Leh: T. Y. Tashigang, 1989; MS TBRC 29577.

*Thams cad kyi dbang phyug gi bcud len nad thams cad 'joms shing lus kyi stobs rgyas par byed pa*

Orgyenpa Rinchenpel (O rgyan pa Rin chen dpal) and Sivadasa (transl.), *Thams cad kyi dbang phyug gi bcud len nad thams cad 'joms shing lus kyi stobs rgyas par byed pa, Bstan 'gyur* (Sde dge blocks), Delhi: Delhi Karmapae Chodhey, Gyalwae Sungrab Partun Khang, 1982–5; MS TBRC 23703.

*Vimalaprabhā*

*Vimalaprabhānāmamūlatantrānusārinidvādaśasahaśrikālaghukālacakratantrarājaṭ ḱkā* (*Bsdus pa'i rgyud kyi rgyal po dus kyi 'khor lo'i 'grel bshad rtsa ba'i rgyud kyi rjes su 'jug pa stong phrag bcu gnyis pa dri ma med pa'i 'od*), *Bka' 'gyur* (Sde ge par phud), Delhi: Delhi Karmapae Chodhey, Gyalwae Sungrab Partun Khang, 1976–9; MS TBRC W22084.

### Secondary Sources

Czaja, O. Winter 2005/Spring 2006, 'Zurkharwa Lodro Gyalpo (1509–79) on the Controversy of the Indian Origin of the rGyud bzhi', *The Tibet Journal*, 30(4) and 31(1): 131–52.

Das, C. 1998 [1902], *A Tibetan-English Dictionary*, Delhi: Book Faith India.

Dash, V. B. 1986, *Alchemy and Metallic Medicine in Ayurveda*, New Delhi: Concept Publishing Company.

———. 1994a, *Pharmacopeia of Tibetan Medicine*, New Delhi: Sri Satguru Publications.

———. 1994b, *Materia Medica of Tibetan Medicine, with Illustrations*, New Delhi: Sri Satguru Publications.

Dash, V. B. and V. L. Kashyap 1980, *Materia Medica of Āyurveda based on Āyurveda Saukhyam of Ṭoḍarānanda*, New Delhi: Concept Publishing Company.

———. 1982, *Diagnosis and Treatment of Diseases in Āyurveda based on Āyurveda Saukhyam of Ṭoḍarānanda*, New Delhi: Concept Publishing Company.

———. 1994, *Iatro-Chemistry of Āyurveda Rasaśāstra based on Āyurveda Saukhyam of Ṭoḍarānanda*, vol. 2, New Delhi: Concept Publishing Company.

Dawa, Dr. 1999, *A Clear Mirror of Tibetan Medical Plants*, Rome: Tibet Domani.

Deshpande, V. 1992, 'Vaṅgastambhanaśodhanaṃ: A Chapter on Metallurgy of Tin in Sanskrit Alchemical Text *Rasopaniṣad*', *Indian Journal of History of Science*, 27(2): 121–8.

Fenner, E. T. 1979, 'Rasāyan Siddhi: Medicine and Alchemy in the Buddhist Tantras', PhD thesis, University of Wisconsin.

Flattery, D. S. and M. Schwartz 1989, *Haoma and Harmaline: The Botanical Identity of the Indo-Iranian Sacred Hallucinogen 'Soma' and its Legacy in Religion, Language, and Middle Eastern Folklore*, Berkeley: University of California Press.



- Gawa Dorjé (Dga' ba rdo rje) 1995, *'Khrungs dpe dri med shel gyi me long*, Pe cin: Mi rigs dpe skrun khang.
- Gerke, B. 2012, "Treating Essence with Essence: Re-inventing *bcud len* as Vitalising Dietary Supplements in Contemporary Tibetan Medicine", in G. Samuel and V. Lo (eds), *Asian Medicine: Tradition and Modernity*, 7(1): 196–224.
- . 2012 (2013), "Treating the Aged" and "Maintaining Health": Locating *bcud len* Practices in the Four Medical Tantras', *The Journal of the International Association of Buddhist Studies*, 35: 329–62.
- Jampa Trinlé (Byams pa 'phrin las) 2000, *Gans ljongs gso rig bstan pa'i nyin byed rim byon gyi rnam thar phyogs bsgrigs*, Pe cin: Mi rigs dpe skrun khang.
- Jampa Trinlé (Byams pa 'phrin las) and Bod rang skyong ljongs sman rtsis khang (eds) 2006, *Bod lugs gso rig tshig mdzod chen mo*, Pe cin: Mi rigs dpe skrun khang.
- Karma Chöpel (Skar ma chos 'phel) 1993, *Bdud rtsi sman gyi 'khrungs dpe legs bshad nor bu'i phreng mdzes*, Lha sa: Bod ljongs mi dmangs dpe skrun khang.
- Karmay, Samten G. 1998, 'The Four Tibetan Medical Treatises and their Critics', in S. G. Karmay (ed.), *The Arrow and the Spindle. Studies in History, Myths, Rituals and Beliefs in Tibet*, Kathmandu: Mandala Book Point, 228–37.
- Lalou, M. 1950, *Inventaire des Manuscrits Tibétains de Touen-houang Conservés à la Bibliothèque Nationale (Fonds Pelliot Tibétain)*, vol. 2, nos. 850–1282, 46, Paris: Bibliothèque Nationale.
- Li, B. W. L. 2011, 'A Critical Study of the Life of the 13th-century Tibetan Monk U rgyan pa Rin chen dpal based on his Biographies', PhD thesis, submitted at Wolfson College, Tibetan and Himalayan Studies, Faculty of Oriental Studies, University of Oxford.
- Martin, D. 2007, 'An Early Tibetan History of Indian Medicine', in M. Schrempf (ed.), *Soundings in Tibetan Medicine. Anthropological and Historical Perspectives. Proceedings of the 10th Seminar of the International Association for Tibetan Studies (IATS) Oxford 2003*, Leiden, Boston: Brill, 307–25.
- Monier-Williams, M. 1960, *A Sanskrit-English Dictionary, Etymologically and Philologically Arranged, with Special Reference to Cognate Indo-European Languages, New Edition, Greatly Enlarged and Improved, with the Collaboration of E. Leumann, C. Cappeller and other Scholars*, Oxford: Oxford University Press.
- Namkhai Norbu 1995, *Drung, De'u and Bön: Narrations, Symbolic Languages and the Bön Tradition in Ancient Tibet*, Dharamsala: Library of Tibetan of Works and Archives.
- Pasang Yonten Arya 1998, *Dictionary of Tibetan Materia Medica*, Delhi: Motilal Banarsidass.
- Pereira, M. 2000, 'Heavens on Earth: From the Tabula Smaragdina to the Alchemical Fifth Essence', *Early Science and Medicine*, 5(2): 131–44.

- Ray, M. 1991, 'Minerals and Gems in Indian Alchemy', *Indian Journal of History of Science*, 26(2): 133–54.
- Ray, P. (ed.) 1956, *History of Chemistry in Ancient and Medieval India: Incorporating the History of Hindu Chemistry by Acharya Prafulla Chandra Ray*, Calcutta: Indian Chemical Society.
- Ridak, Dawa 2003, *Bod kyi gso ba rig pa las sman rdzas sbyod bzos ba'i lag len gsang sgo 'byed pa'i lde mig*, New Delhi: Rig Drag Publication.
- Sachau E. C. 1910, *Alberuni's India. An Account of the Religion, Philosophy, Literature, Chronology, Geography, Astronomy, Customs, Laws and Astrology of India about 1030 AD*, vol. I, London: Kegan Paul, Trench, Trübner & Co. Ltd.
- Samuel, G. 2010, 'A Short History of Indo-Tibetan Alchemy', in S. Craig, M. Cuomo, F. Garrett, and M. Schrempf (eds), *Studies of Medical Pluralism in Tibetan History and Society (Proceedings of the 11th Seminar of the International Association for Tibetan Studies, Bonn 2006)*, Andiast, Switzerland: International Institute for Tibetan and Buddhist Studies GmbH, 221–33.
- Sékhar Künga Tséring (Bse mkhar Kun dga' tshe ring) 1997 *Sman ming gi mdzod*, Lan kru'u: Kan su'u mi rigs dpe skrun khang.
- Simioli, C. (forthcoming), 'L'Elisir Mercuriale Nella Tradizione Medico-Alchemica Tibetana', *Annali dell'Università degli Studi di Napoli L'Orientale* (AION).
- Trashis Serkhang (Bkra shis gser khang) 1997, *Bdud rtsi sman gyi rnam bshad blo gsar dga' ston*, Lan kru'u: Kan su'u mi rigs dpe skrun khang.
- Wallace V. A. 2009, 'Medicine and Astrology in the Healing Arts of the *Kālacakratāntra*', in E. A. Arnold (ed.), *As Long as Space Endures: Essays on the Kālacakra Tantra in Honor of H. H. The Dalai Lama*, Ithaca NY: Snow Lion Publications, 277–300.
- Walter, M. 1992, 'Jābir the Buddhist Yogi, Part One', *Journal of Indian Philosophy*, 20: 425–38.
- White, D. G. 1996, *The Alchemical Body: Siddha Tradition in Medieval India*, Chicago: University of Chicago Press.
- Yoeli-Tlalim, R. 2010, 'On Urine Analysis and Tibetan Medicine's Connections with the West', in S. Craig, M. Cuomo, F. Garrett, M. Schrempf (eds), *Studies of Medical Pluralism in Tibetan History and Society (Proceedings of the 11th Seminar of the International Association for Tibetan Studies, Bonn 2006)*, Andiast, Switzerland: International Institute for Tibetan and Buddhist Studies GmbH, 195–211.
- . 2011, 'Islam and Tibet: Cultural Interactions—An Introduction', in A. Akosay, C. Burnett, R. Yoeli-Tlalim (eds), *Islam and Tibet: Interactions along the Musk Routes*, Farnham: Ashgate Publishing Ltd., 1–16.
- . 2012, 'Revisiting Galen in Tibet', *Medical History*, 56(3): 355–65.
- Yonten Gyatso 1991, 'The Secrets of the Black Pills Formulation', *Tibetan Medicine* 13, 38–55.