The alchemy of herbal medicine: spagyric tinctures, elixirs and the vegetable stone

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Abstract: Spagyric tinctures and elixirs represent a traditional herbal manufacturing dosage form that has strong links to alchemy, which is believed by many historians to be the progenitor of modern chemistry. The first to publish extensively on the topic of spagyrics was Phillipus Aureolus Theophrastus von Hohenheim (Paracelsus), who presented the idea of reincorporating the calcined herbal marc back into the herbal tincture. This paper seeks to discuss the evolution of spagyrics and its close links to alchemy, also touching briefly on foundational alchemical concepts to provide a basis of understanding for spagyric development. It will also highlight certain key manufacturing steps that are required in the making of the spagyric tincture, spagyric elixir and the highly prized Lapis vegetabilis (vegetable stone).

Introduction

Herbal medicine has a long history of use dating back approximately 60,000 years (Leroi-Gourhan 1975, Lietava 1992), with actual written evidence documented as far back as the Sumerians (ca. 5400BCE) and Akkadians (ca. 2270-2083BCE) of ancient Mesopotamia (Sinclair & Hechtman 2011, Estes 1989). During this evolving timeframe, multifarious posological formats of herb delivery have been utilised, from raw crude herb taken as a powder or burnt and inhaled, to highly sophisticated standardised extract pro extracts, oxymels, syrups and liquid extracts. Amidst this development, the concept of spagyrics was conceived, which represents an almost forgotten herbal manufacturing method that medieval period writings suggest was first expounded by Paracelsus (1493-1541CE) at a time in history preceding the scientific revolution (1550-1700CE).

To understand the historical development of herbal spagyric tinctures and elixirs, one must first explore some fundamental philosophies of the ancient science of alchemy. Alchemy has been practised in numerous and diverse cultures throughout history, with examples of its practice being found in Indian, Greek, Chinese and Arabic literature (Holmyard 1990). It began its slow infiltration into Europe via the occupation of the Iberian Peninsula by the Islamic Moors, and the various alchemical treatises were translated into languages other than Latin, Arabic and Greek.

Alchemy has numerous definitions that encompass various viewpoints depending on the individual academic authority. From a modern perspective, alchemy has been defined as a “medieval forerunner of chemistry, concerned with the transmutation of matter; in particular, with attempts to convert base metals into gold…” (Oxford 2013) or “a medieval chemical science and speculative philosophy aiming to achieve the transmutation of the base metals into gold, the discovery of a universal cure for disease and the discovery of a means of indefinitely prolonging life” (Merriam-Webster 2013).

Conversely, the definitions as described from actual practising alchemists are quite different. Alchemy is defined by Frater Albertus (1974) as ‘the raising of vibrations...a transmutation’. In the words of Paracelsus, alchemy “… is to carry to its end something that has not yet been completed’ (Jacobi 1979) and is a method for ‘discerning between the true and the false’ (Paracelsus & Waite 1894). Jabir ibn Hayyan (721-815CE), known as Geber in the West, states that ‘this Science treats of the imperfect bodies of minerals, and teacheth how to perfect them’ (Russell 1994). What both ancient and modern interpretations allude to is a single universal substance which can perfect matter, taking something that is vulgar and purifying and perfecting it into something rarified and special. Alchemists called this alchemical substance lapis philosophorum, more commonly known as the philosopher’s stone. However, the application of this knowledge is where modern and alchemical interpretations divide. Modern authorities suggest alchemy simply being used on matter in its diverse crude physical forms; whereas alchemists agree that this can also be taken to refer to the perfection of the human being, therefore also representing a metaphysical or spiritual process toward enlightenment (Eliade 1962, Roob 2009).

The use of the term ‘science’ in defining alchemy is of great importance, as it posits the use of an evidence-based scientific method that the ancients were utilising centuries before the publication of On the Revolutions of the Heavenly Spheres by Nickolaus Copernicus in 1543, which is cited as being the beginning of what we now call the Scientific Revolution. Modern evidence gives support to this with the testing of medical interventions for efficacy by Avicenna in the 11th century, as discussed in The Canon of Medicine (Brater & Daly 2000, Daly & Brater 2000), long before the proposed birth of comparable
randomised clinical trials in 1747 by James Lind (Jallion 2007). If science is defined as ‘the intellectual and practical activity encompassing the systematic study of the structure and behaviour of the physical and natural world through observation and experiment’ (Oxford 2013), such a definition either narrows the gap between what we call ‘traditional’ and ‘scientific’ evidence, or blurs the lines which divide them.

Etymology

There currently exist two major theories as to the etymology of the word alchemy. Goddard (1999) posits that the Arabic definite article ‘Al’ was combined with the word ‘Khem/Chem’, an ancient name for Egypt which literally translates as ‘black earth’ or ‘black land’. This reference was to the black fertile soil of the Nile delta, which made Egypt a trading and agricultural juggernaut at the time. In contrast, the Oxford dictionary (2013) postulates that the Greek terms ‘Khemia’ or ‘Chumeia’ (χυμεία) has links to ancient pharmaceutical practices and the ‘art of transmuting metals’. Whilst these theories posit on the etymology of the term ‘alchemy’, they do not prove that either of these cultures can lay claim to its genesis.

History of alchemy

Of particular interest are the many learned people that have studied alchemy throughout the ages, many of whom laid the foundation for the modern sciences as we currently know them. A short list of key alchemical practitioners is highlighted below in Table 1.

Worthy of note here is Paracelsus, considered a father of modern toxicology; Robert Boyle, considered the father of modern chemistry, inventor of Boyle’s Law and author of the Skeptical Chymist; Hennig Brandt who discovered phosphorus, and Sir Isaac Newton, who wrote extensively on the topic of alchemy. This fascination with alchemy led the economist J.M. Keynes, who held the largest privately owned collection of Newton’s ‘Chymical’ writings, to say that Newton ‘was not the first of the Age of Reason. He was the last of the magicians’ (Royal Society 1946).

The Circulations

In alchemy, there exist two major arms of practice: The Circulatum majus (Greater Circulation: Alchemy) and the Circulatum minus (Lesser Circulation: Spagyrics). The Greater Circulation was focused primarily on the use of minerals and metals and was fundamentally concerned with the manufacture of the Lapis philosophorum and other medicinal and transformative substances; whereas the Lesser Circulation was based upon the exclusive use of plants and animal products for therapeutic benefit in health. It was believed by many alchemists that the Circulatum minus was a precursor or primer to work in the more dangerous kingdom of minerals and metals; therefore, until mastery of this had been achieved (which was set out as producing a lapis vegetabilis or vegetable stone), the mineral kingdom was closed. Our modern understanding of toxicology specifically associated with minerals and metals such as antimony, lead and mercury, gives credence to this understanding, and it is well known that many naïve and ill-prepared alchemists met an untimely demise due to dabbling in the Great Work (another name for alchemy).

Both alchemy and spagyrics relied heavily on symbolism and allegory as a way of both expressing complex procedures and philosophies and also of protecting these procedures and philosophies from those considered unworthy of the knowledge. Alchemists went to great lengths to protect this arcane wisdom, which is largely why many worked in solitude and in secret. An example of this is a postulated theory behind the

<table>
<thead>
<tr>
<th>Wei Boyang (ca.142CE)</th>
<th>Paracelsus (1493–1541)</th>
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<tbody>
<tr>
<td>Maria Prophetissa (ca.300CE)</td>
<td>Basilius Valentinus (ca. 15th century)</td>
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<tr>
<td>Zosimos of Panopolis (ca. 300CE)</td>
<td>Dr John Dee (ca. 1527–1609)</td>
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<tr>
<td>Jabir ibn Hayyan “Geber” (721–815CE)</td>
<td>Robert Boyle (1627–1691)</td>
</tr>
<tr>
<td>Muhammad ibn Zakariya Razi (864–930CE)</td>
<td>Hennig Brandt (ca. 1630–1710)</td>
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<tr>
<td>Abu Abdallah ibn Sina “Avicenna” (980–1037CE)</td>
<td>Sir Isaac Newton (ca. 1642–1727)</td>
</tr>
<tr>
<td>Roger Bacon (ca. 1214–1294CE)</td>
<td>Fulcanelli (ca. 20th century)</td>
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etymology of the word ‘gibberish’ (meaning meaningless or unintelligible speech or writing) which is attributed to the alchemist Geber, and referred to the almost indecipherable technical jargon he used in concealing the Great Work in his writings.

The Tria Prima – the three essentials

In alchemy, the concept of the duality of opposites is a very important philosophical underpinning, and gives rise to the concept of the Two Principles. Examples of this duality include terms used in alchemical literature describing the ‘Sun and the Moon’ or the ‘King and the Queen’, and it is a similar duality that is observed in other ancient paradigms such as the symbol of the Tao (Yin / Yang) in traditional Taoist philosophy. The idea of the Two Principles was based originally upon Aristotelian concepts in trying to explain the formation of metals and their transitions from an elemental perspective (Cotnoir 2006). The Sufi alchemist Jabir ibn Hayyan (Geber) developed further upon this concept and identified that it was a matter of balancing the two forces within the metals (the sulphur and the mercury) to transmute it to its most purified and highest state (Cotnoir 2006).

Over six centuries later, Paracelsus contributed further to this idea of Geber’s by stating that the ‘salt’, or body, was needed to be added to the Two Principle theory to bring solidity and stability. This gave birth to the Tria Prima, which has been the dominant thought in spagyrics since its inception and is the major differentiation between the two alchemical circulations.

The author wishes to make it very clear that whenever you see the terms “sulphur”, “mercury” or “salt” in this article, it is never suggesting the modern chemical meaning or structure (e.g. brimstone, quicksilver or common table salt [NaCl]); it is only talking about their specific ‘spagyric’ or ‘alchemical’ meanings which are expanded upon below. These terms have both metaphysical and physical meanings that are sometimes used interchangeably and can represent a trap for the uninitiated.

The Tria Prima suggests that all herbal substances can be broken down into three basic components – sulphur, mercury and salt. These essentials represent both metaphysical aspects within the herb and more practical phytochemical aspects of the plant material. Please see Figure 2 below for a basic review of this information.

In modern herbal medicine, the sulphur and mercury of the plant is obtained from judicious use of a balanced menstruum to extract the ‘soul’ and ‘spirit’, however, the marc is discarded and viewed as having little therapeutic benefit. Spagyrlic tinctures and elixirs re-incorporate the marc back into the herbal product in the form of an ash to assist in ‘fixing’ the more ethereal and volatile components.

Spagyrics

The term spagyrics comes from the Greek spao meaning ‘to tear apart’ or ‘draw out’ and ageiro meaning ‘to gather, to bind or to join’ (Junius 1979, Cotnoir 2006). It was first coined by Paracelsus and represents the key alchemical premise of solve et coagula – ‘separate and recombine’. This concept of separating and purifying a substance and then bringing the purified parts back into combination into a new highly energised and potentised form suggests that the alchemists did not believe that Nature was perfect, but needed assistance to raise it to a new level of exaltation.

According to a spokeswoman for the Therapeutic Goods Administration, spagyrlic tinctures have been included in the code tables of the Australian Register of Therapeutic Goods (ARTG) in association with herbal ingredients since July 2002 (Personal communication 2013), yet many naturopaths and herbalists are unaware of their existence as a potential herbal dosage form. This could be due to both a lack of education in this particular field of manufacturing in the tertiary academic setting, and an almost non-existent presence within the herbal marketplace. The requirement of specialist equipment, manufacturing expertise and the fact that it is a time consuming method could also be drivers for lack of interest.

<table>
<thead>
<tr>
<th>Sulphur – Soul – Masculine principle</th>
<th>Mercury – Spirit – Female principle</th>
<th>Salt – Body</th>
</tr>
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<tbody>
<tr>
<td>• In spagyrics – volatile principles / oils of the plant</td>
<td>• In spagyrics – a liquor / spirit or tincture of the plant</td>
<td>• That which is solid, a vehicle, that which fixes, an alkali / salt</td>
</tr>
<tr>
<td>• That which is active, formative, aggressive</td>
<td>• That which is passive, ethereal, vitalistic</td>
<td></td>
</tr>
<tr>
<td>• Consciousness</td>
<td>• Life (vital) force - Prana</td>
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Figure 2: Metaphysical & physical aspects of the Tria Prima, taken from Junius 1979; Cotnoir 2006; Albertus 1974.
The spagyric tincture

Qabalah and astrology feature prominently in alchemical and spagyric practice. In short, Qabalah is considered to be a system of esoteric knowledge and practices that stemmed from the Jewish tradition. Over the centuries this practice has evolved to include associations with alchemy, divination, hermeticism and other non-conventional practices that veered away from traditional Judaic philosophy. Qabalah is centred on the philosophy of the Etz Chayyim, or Tree of Life, which is believed to be symbolic of the spiritual evolution of man and the essence of divinity and creation. Fortune (2000) describes the Tree of Life as “representing the cosmos in its entirety and the soul of man as related thereto”, which provides credence to the idea that the alchemical arts were not merely a materialistic pursuit, but a spiritual one also.

Astrology, which is defined as the study of the celestial movements and positions of the planets and stars and how they can have a “supposed influence on events and on the behaviour of people” (Merriam-Webster 2013) was also an important pillar on which alchemical and spagyric belief was built. Not only could this be applied to the individual being treated from a constitutional perspective, but it could also highlight specific times that are considered auspicious for manufacturing. For example, each weekday represents a ruling planet to which certain herbs or metals correspond (see Figure 3). Therefore, if a spagyric of German chamomile was desired, one would start the process of manufacturing on a Sunday. Furthermore, specific hours within the day would also be adhered to. As each 24-hour period can be broken into planetary rule, so the correct day and hour would be observed to start the specific project. Lunar cycles are also important, with waxing and waning moons causing different outcomes to the spagyric product, and new and full moons being seen as more advantageous and propitious. Such use of astrology is not unknown in herbal medicine, with noted herbalists such as Culpeper utilising this extensively in his publications.

Three major steps are required in the manufacturing of the herbal spagyric tincture, including separation, purification and cohabitation.

1. Separation

Separation involves capturing the sulphur and mercury of the plant with a menstruum of water and alcohol. The alcohol used where possible should be spiritus vini, more commonly known as rectified spirit of wine. Alchemists believed that the ethanol obtained from grapes has a higher energetic level and contains more vital force than that derived from grains. The herb is then ground to a suitable size (commination) with a mortar and pestle; however, machinery to reduce the herb to a smaller particle size may be needed for the tougher morphological parts of certain plants, such as the bark or roots. The appropriate menstruum for the herb is selected based on chemistry; however, many traditional alchemists such as Frater Albertus utilised a 66% ethanol to 33% (2/3:1/3) water ratio regardless of the herb being used. Other authors state that a 50:50 ratio is best (Cotnoir 2006).

The herb is then incorporated with the menstruum in a sealed glass vessel, wrapped in aluminium foil or kept in a dark place and digested for a philosophical month (40 days), being agitated several times daily. The term digestion denotes the gentle application of heat, with a temperature generally not exceeding 40°C so as to
avoid damaging the heat sensitive constituents. Ancient alchemists believed it should be no hotter than was needed to hatch a chicken egg (approximately 37.5°C). Digestion can take place in a gentle sand bath, which represents an excellent apparatus for low heat applications. After the appropriate duration, the tincture was strained, pressed and set aside in a sealed glass vessel, but the marc was not discarded.

2. Purification

The herbal marc is allowed to dry naturally, and then incinerated to ash in a crucible or other fire resistant vessel. This can be done in a muffle furnace or other high temperate athanor. This is a progressive process, as once all of the herbal material has been incinerated; it will still be largely dark grey to black in colour. The ash is now transferred to a mortar and pestle and ground incredibly fine. Certain Chinese alchemical literature discusses the grinding of the alchemical material for up to 6 months, taking it to a state of impalpable fineness, which modern science can now confirm is likely to have taken the particulate matter down to a nanoparticle size (less than a micron in diameter). This process is likely to greatly increase the surface area and reactivity so that reactions are more complete and occur faster. Pharmacokinetic parameters such as absorption may also occur faster with the material having higher bioavailability within the biological system. This may be the basis as to why spagyric tinctures are considered more potent than other equivalent preparations, albeit this is only anecdotal evidence with no quantitative analytical evidence to substantiate it. Once ground finely, the ash is returned to a crucible and fired once again to higher and higher temperatures, with continued grinding in between firings as needed, until it takes on a white colour, showing the highest level of purification. All of the dross and detritus has been burned away once the white ash has been obtained, leaving the purified salts of the herb. Once this has been achieved, the salts are set aside in a glass jar.

3. Cohobation

The sulphur and mercury (tincture) is now combined with the salts (ash) in glass vessels known as ‘pelicans’ and allowed to cohobate. The process of cohobation, also known as circulation, is said to allow the ‘elevation’ and ‘expansion’ of the tincture, making it more powerful. The process is conducted again for a philosophical month and is digested in a sand bath. Daily agitation is not essential as the gentle application of heat ‘circulates’ or moves the fine particulate ash throughout the tincture. Once this process is complete, it is poured into a storage bottle and labelled, ready for use. The average dose of a spagyric tincture would be similar to other modern day tinctures based on the herb’s pharmacology; however, alchemists and spagyrists consume these tinctures quite differently. The manufacture of the ‘Planetary 7’, that is, 7 different herbal spagyric tinctures, each coinciding with a corresponding day of the week, is a tradition which is seen as an initiatory practice of the Lesser Circulation. For example, on Monday upon rising, 5 mL of a tincture of cleavers would be consumed, followed by 5 mL of hawthorn tincture on the Tuesday, and so on in a process that would continue for an entire year. This process was thought to bring balance to the body and its various organ systems, maintaining health and vigour.

The spagyric elixir

The next level of plant mastery was the spagyric elixir. This process was seen as the next level of elevation in the vegetable kingdom, producing a more powerful and purified substance. Manufacturing the elixir involves the separation of the plant matter into its three distinct *Tria Prima*, unlike the spagyric tincture that incorporated the sulphur and mercury together (essential oil and tincture) with the inclusion of the salts.

1. Separation

Herbs of high volatile oil content are excellent for elixirs, particularly rosemary and fennel. Using fennel as an example, the whole plant (fresh, not dried) is allowed to grow until it goes to seed. The seed is then harvested and gently dried. After being bruised with a mortar and pestle, it is placed in a distillation apparatus and the oils are separated. Once all of the oils have come over in the condenser and been collected in the separating funnel, they are isolated and stored in an amber glass bottle and saved for the cohobation phase.

2. Fermentation

The fennel stalks and leaves are now cut finely and placed within a large glass (15-20 L) demi-john or fermentation vessel. Water is added along with brewing yeast (such as *Saccharomyces cerevisiae*) and a small amount of sugar to give a more stable fermentation. The vessel is sealed with an airlock and kept at a constant temperature of around 25-27°C using heating mats if required. After 24-48 hours, the fermentation process will commence and alcohol is made from the herbal material. Once the fermentation process has stopped, the mixture is distilled at 78°C (being careful to discard anything that came over before this temperature). The process is completed 7 times to produce approximately 90% pure alcohol. In spagyrics, the signature of the plant is believed to be ‘imprinted’ into the alcohol, which after being purified is set aside and labelled.

3. Purification

The marc from the fermentation (stalks and leaves) and the seeds from the distillation are dried and then incinerated and calcined into a fine white ash in exactly the same process as was outlined for the spagyric tincture. The three essentials (volatile oil, alcohol and salts) are then recombined in equal proportions into a glass bottle and labelled. Alternatively, this can then undergo a
further process of cohabation if desired. Dosage of the spagyric elixir is drop dose only (literally 1-2 drops of elixir) due to the toxicity profile of the purified essential oils and should certainly not be consumed in the amounts outlined for the spagyric tincture.

The *lapis vegetabilis* (vegetable stone)

The vegetable stone represents the first historical evidence of what in modern pharmacology is known as a soft extract. The vegetable stone was perceived as the pinnacle of achievement in the *Circulatum minus* and represents one of the strongest forms of medicine in the spagyric realm. The *lapis vegetabilis* is notoriously time consuming and laborious to manufacture, with a time frame spanning from 10 – 18 months to complete, although numerous ‘short-cuts’ have been proposed by more modern practitioners. Traditionally, large amounts of all three essentials are placed into a specialised flask which is then hermetically sealed and deposited in a sand bath at 40°C. As the salts (purified ash) take up the sulphur and mercury (essential oil and alcohol) it starts to congeal and thicken, at which time more sulphur and mercury may be added in small amounts. This process of ‘feeding’ the stone can take months until eventually it cannot take anymore in and the process has been completed.

Conclusion

Herbal medicine, as well as modern sciences like chemistry, can claim a direct lineage to alchemical and spagyric practices. Whilst no direct scientific evidence exists within the literature regarding spagyric tinctures, elixirs or the vegetable stone, this should not necessarily discount their relevance as a traditional dosage form.

The author would strongly advise caution before attempting the manufacture of any of these dosage forms without first seeking appropriate training in the requisite use of laboratory glassware, spagyric manufacturing methods and safety in handling of the various chemicals and solvents. State and federal laws for owning such glassware, chemicals and stills are also in effect nationwide and should be respected. A recommended reading list has been included for those who wish to learn more about these dosage forms.

In finishing, of particular relevance in this paper was the alchemical concept of the duality of opposites, a topic quite pertinent in the herbal and naturopathic profession at present. This duality represents a philosophical one as our profession continues to evolve its expanding evidence base, and a schism appears to be growing between our more traditionally trained practitioners and those that embrace a more modern and scientific approach.

The profession is currently going through its own transmutation of sorts, our own evolutionary change, and the question that remains to be answered is what will come of it? Tradition and science are not chalk and cheese, but rather simply represent differing ends of the same spectrum we call ‘evidence’. You cannot have one without the other. Each one drives the other, enriches the other, teaches the other and even supports the other. Science is knowledge, but tradition represents wisdom – both important attributes in either practitioner or paradigm. The profession cannot forget or disregard our traditional evidence or we may risk losing our own identify in a near frenzied push for acceptance by a modern medical model that developed out of our own tradition. Conversely, we cannot cling to certain traditional beliefs that have been proven incorrect by science.

Based on our evidence, what does it mean to be a herbalist or naturopath in this day and age? How far removed are we from our traditional roots? How much tradition should we cling to? Should scientific advances in herbal medicine theory and usage supersede our traditional evidence on a hierarchical scale of importance for us as practitioners, or for the teaching of current students, who are our profession of the future?

Whilst our continued growth and evolution as a profession is assured, it is now time to set in motion this discussion so we may thoughtfully and diligently consider the importance of where we have come from, and where we are going...

Recommended Readings


Reference List


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