And I cannot end without referencing a few of the classic interpretative studies: Peter Vorzimmer's (1970) *Charles Darwin, the years of controversy: the 'Origin of species' and its critics, 1859-82*, Dov Ospovat's (1981) *The development of Darwin's theory: natural history, natural theology, and natural selection*, Robert Young's (1985) *Darwin's metaphor: nature's place in Victorian culture*, Peter Bowler's (1988) *The non-Darwinian Revolution: reinterpreting a historical myth*, and Ernst Mayr's (1991) *One long argument: Charles Darwin and the genesis of modern evolutionary thought*.

And two very important collections of essays: *The comparative reception of Darwinism*, edited by Thomas Glick (1974), and *The Darwinian Heritage*, edited by David Kohn (1985).

The thread that could not be broken

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INTRODUCTION

It is more usual to start an article on herbal medicine with its ancient lore and learning. I however, am going to start with Ireland in recent times and show that this traditional system of medicine is a thread that refuses to be broken and will in the present time enjoy a new dawn, invigorated and robust, if we have the confidence and courage to reclaim it.

Any of the myriad illnesses that we are heirs to, respond to the healing powers of the plants that grow in our fields, bogs and meadows, be it the nettle or dandelion, whitethorn or elderberry. Many patients ask me from where did this knowledge come and they are incredulous when I tell them that it is their own traditional medicine. It is the knotted, tangled, almost broken thread of a system that cared well for Irish society until its displacement and dislodgement in the political turmoil of our history. It is ironic, that today an Irish health service will cover the cost of conventional medicine but not the cost of treating people with the medicine of their forebears.

The traditional medical systems of China (TCM) and India (Ayurveda) are gaining new prominence and once again we are in danger of ringing the death knell on our own. This is not because it is not there but because it seems to have become obscured, made invisible by exotic and mysterious systems from abroad. It sounds more sophisticated to speak of *Ginseng* and *Astragalus,* than oats and nettle. We are facing the old danger that familiarity breeds contempt. The distressing part of this disregard of our rich herbal tradition is that we also lose the spin off in research, manufacturing and industry.

In 1933, Prof. J. O'Reilly of the Chemistry department in University College Cork (UCC) wrote an article in *Studies* advising the new government that there were three indigenous industries that could be

developed for the betterment of the economy. These were the development of peatlands, forestry, and the growing of herbs and essential oil extraction. The first of these three developed into Bord na Móna, the second into Coillte and unfortunately the third, never even saw the light of day. If Prof. O'Reilly was so prescient about the first two, perhaps he should be listened to regarding the third...even if it is 80 plus years later.

In a small town called Aboca in Italy a gentleman began to grow and process herbs 25 years ago. Today that company – Aboca- harvests organically grown herbs from 1600 acres, employs hundreds of people and has a turnover of many millions per annum. It is also a Mecca for tourists and has an active research and development department. It has expanded into the USA and is optimistic about the future.

Would that we had listened to Prof. O'Reilly and his colleagues?

Perhaps we can try to comfort ourselves with the idea that this knowledge is dead and that we are not familiar with the old cures, but this does not hold true. I grew up with the adage *'whiskey for the heart and brandy for the stomach'*. A student recently informed me that he heard that a glass of whiskey was the 'old' cure for some one having a heart attack. This resonated with my own experience as my father was directed by his GP to have a glass of whiskey at 11 every morning for his angina. If that cure was currently adopted, perhaps it would help the spiralling drugs bill of the government and the profits of Midleton, Paddy and Power?

I am not suggesting that we adopt such folk aphorisms without investigation. The above maxim regarding whiskey and brandy caused me to research the effects of whiskey on the chemical, constituent profile of hawthorn (*Crataegus oxycantha*) for my MSc. dissertation. In the process, I discovered that whiskey, through its effects on the GABA receptors in the brain, induces anxiolytic, sedative and anaesthetic activity (Koda et al, 2003). Does not this explain its popularity as a nightcap?

Many of us remember the local bonesetter and regrettably this tradition does not seem to be as widespread in the first decade of the twenty-first century as it was in the latter half of the twentieth. This was living medicine. It may not have passed the double blind, placebo controlled trial gold standard of the pharmaceutical industry but it served many a person well and has now been replaced by the chiropractor and

osteopath. Instead of taking the basic skill and techniques of the bonesetter, respecting this knowledge and building on it, we chose instead to view it as something from our poverty-stricken past for which we had no need once we moved up in the world. Instead of viewing the bonesetters and those with specific 'cures' as the guardians of the repository of our medical knowledge, we chose instead to marginalize them and see their skills as somehow uneducated, uninformed, or even worse, something magical. It is as if we treat with contempt all knowledge that does not emanate from the schoolroom or laboratory, not realizing that the empirical is the very basis of innovative and sound science. Dr. M.F. Moloney (1919) stresses in the preface of his book *Luibh-Sheanchus* that the annals of medicine in Ireland are largely that of the Anglo-Celtic school with scant regard for our own comprehensive ethno botany. He stresses the importance of collaboration between the Ethno Botany of the Celts and modern pharmacology so as to revisit the knowledge of the Irish physicians long ago. He would be heartened to know that 86 years from the publication of his book, The Irish Institute of Medical Herbalists developed with Cork Institute of Technology the only B.Sc in Herbal Science in this country. After four years of study, these graduates have a further 2 years of study to attain their M.Sc and it is only then that The Irish Institute of Medical Herbalists considers that they have achieved the competencies required, to be able to minister to patients and treat their illnesses, as the *Liaig* of the 17th century did. The student today might groan at 6 years of study but the Irish herbal physician of the 15th century and before, was trained for many, many years in highly regulated medical schools. These schools were regulated by the hereditary physician families. They established and regulated the medical schools; developed the curriculum, oversaw the practical training of the *liaig* and ensured that the best of European learning was grafted on to indigenous knowledge through translation of manuscripts used in the great schools of Montpelier and Salerno (Nic Dhonnchadha, 2000)

EFFORTS AT REVIVAL

The first half of the twentieth century saw a great interest in revitalizing the folk herbal traditions and developing them. The North Infirmary hospital in Cork was situated in an area called the apothecaries' gardens and the sick travelled there from great distances to seek medicinal herbs. During World War 1, collections of herbs were organized in vari-

ous centres in the south of Ireland and from there they were sent to th London market in Mincing Lane (Reilly, 1933). The wooden storag buildings and drying sheds where the herbs were sorted remained i UCC up to the 1950s. Christina Quinlan who was a lecturer in Botan in UCC in 1919, published a small booklet

explaining how to identify, collect and deal with the common plant used in medicine. The preface of this booklet states:

> *'This booklet is issued by the Commissioners of National Education in consultation with the Herb Association, with the object of stimulating throughout Ireland, and especially amongst managers, teachers and pupils of national schools, an interest in wild plants not only as an important branch of the science of botany, but as a means of promoting the establishment of an Irish industry of considerable value at all times...'*

Prof O'Reilly (Studies, 1933) reports that the essential oils yielded from semi-technical plantings of lavender, peppermint and chamomile were of very high standard. The results of this research were reported on in the *Economic Proceedings of the Royal Dublin Society,* Vol. II, XVI, 1926; XVII, XXVIII, XIX, 1927; XXV, 1929 and by the *Perfumery and Essential Record* Vol. XV11, 12,469, 1926.

Jude (Tadg Foley, 1933) also stressed the importance of our native herbs for the development of industry and Shawn Sheehan (1938) translated the *Gaulterus De Dosibus* into Irish as he considered the time had come in Ireland for this knowledge. The *Gaulterus* is a pharmaceutical tract by Gaulterus Agilon (*fl. c.* 1250) entitled *De Dosibus Medicinarum* and provides a concise introduction to the basic principles and operations of medieval pharmacy. This knowledge would be necessary if professional pharmacists and physicians were to fully understand what herbs to use and how to dispense them.

FOLKLORE COMMISSION

In the first half of the twentieth century we can see that there was concerted effort on the part of professional scientists to build a research base and industry on local knowledge and availability of herbs. This nascent research came to an abrupt halt with the discovery and commercialization of penicillin in the 1940's. This wonder drug meant that the fledgling industry died a death before it was even born. What was now

left was the local knowledge and the herbs, but no interest in identifying or developing this knowledge as a basis for medicine, research and industry. We can be eternally grateful for the work of the Irish Folklore Commission (IFC) in 1937-38 as it was of paramount importance in recording so many folk remedies. It instigated the collection of folklore throughout the National Schools of the 26 counties. This undertaking had the support of the Dept of Education and the Irish National Teachers organization (INTO) and was a resounding success resulting in more then 4500 note books returned to the Commission. A booklet *Irish folklore and tradition* was compiled by Seán Ó Súilleabháin, the IFC's archivist, and issued to the principal teacher of each primary school. It contained instructions as to how the scheme was to be carried out so there was clarity for teachers and simpler guidelines for children.

FOLK CURES

These notebooks can still be studied and are available on microfiche in the county libraries. It is the gems of knowledge contained therein that give proof to the assertion that they are the gleanings of a much more learned tradition. A child from Dunmanway in 1938 mentions the use of cobwebs to stop bleeding. I have heard anecdotal reports from patients that this has been used until very recently, to staunch bleeding when dehorning cattle as well as for cuts and scrapes. Charles Stuart Parnell crushed his hand in machinery at his Arklow quarries and an old servant dressed the injured fingers with cobwebs from the cellar walls (O'Shea, 1914). This knowledge about cobwebs can be traced back to a medical manuscript that was transcribed from Latin into Irish by an Irish *Liaig,* T.Ó Cuinn in 1415. This manuscript is a compilation in Irish of various Latin works that were in general use by medical people in the middle- ages. The principal source of the knowledge therein is the *Circa Instans* and this has been dated to shortly after 1070 (Murphy, 1991). The Tadhg Ó Cuinn manuscript has this to say about cobwebs:

> ***Tele rania:*** *i.e. the spider's web; cold and dry; it has the retentive virtue; it stops the bleeding of wounds, and it heals as we have said.'*

Cobwebs were among one of Galen's (129 -200 AD) favourite wound dressings and they were also used in wound care in ancient Egypt (Roberts and Walters, 1997). It is quite extraordinary that this gem of

wisdom survived the vicissitudes of Irish history to appear in a notebook in Doire na Cathrach, Dunmanway in the 1930s, where the Principal was Risteárd Mac Gearailt. This school also reports on the use of brooklime (Ipofilia) with directions to mix it with buttermilk and oatmeal as a boiled poultice. The T.Ó Cuinn manuscript mentions that a warm plaster of brooklime serves well against poisoning and pain. Even though the T.Ó Cuinn manuscript is a compilation in Irish of various Latin works there are 22 herbs mentioned therein for which no Latin source has been found. It is most probable that these herbs relate to a purely Irish tradition (Murphy, 1991).

Succisa pratensis (caisearban bec; devil's bit) has a child saying in 1938 that *'the main root of it would cure anything.'* When one reads the entry by T.Ó Cuinn in 1415, (Murphy, 1991) one can see why the folklore commission notebook from Doire na Cathrach, reports it in this abbreviated manner as the original is both long and complex. It is attributed with the power to heal a scabby head, rash, alopecia, haemorrhoids (plus mustard, garlic and wine), external piles, tenesmus, cold rheum in old people, boils known as anthrax, deafness (poultice), pain in the sides and kidneys, dry cough, ripening boils and finally, as a 'drawer' of poison. The entry in the folklore commission notebook, recording that it *'would cure anything'* as an abbreviated version of the foregoing list is therefore quite understandable. Without access to the written accounts of the different methods of preparing this herb for each of the above illnesses, the knowledge of the use of this herb was, given the historical situation, probably transmitted orally. The complexity of its therapeutic effects and its method of use is gradually diminished over the generations to an herb, the main root of which would cure anything. K'eogh (1735) describes it as hot and dry in nature. This is not as exact as Ó Cuinn, (1415) who tells us that *'it is hot and dry in the second degree'*. K'eogh also reduces its method of preparation to a decoction and ointment whereas Ó Cuinn uses poultices, juice, ointment, decoction, as well as adding other ingredients with it. Keogh says it is good against *'coughs, abscesses and sore throats* and *it is good against scabby and itchy skin if it is made into an ointment'* These three entries ranging from 1415 to 1938 show the diminution in knowledge over 500 years but also the tenacity of the core of the information to survive.

Not all entries seem to agree with the O'Cuinn manuscript. The entry by Maire Ní Neill, Shanway, Ballineen, which she received from Mrs.

Kate O'Donoghue (age 73) on the 1/12/1938 tells us that Hawkweed (Pilosella officinarum) was used in the treatment of whooping cough.

> *'Hawkweed boiled in water for a few minutes, strained and the liquid sweetened with sugar and taken when the cough was severe.'*

However the entry in the T. Ó Cuinn manuscript uses it as a 'drawing' herb as well as for the relief of pressure on the brain.

> *'Avicenna says to pound this herb and put it on the thorn which is desired to extract from an organ, and it will draw it powerfully. If a head purge be made of it, it will clear the brain of its contamination and if it be given to epileptics, it will relieve them greatly.'*

One could argue that whooping cough does put severe pressure on the brain due to the intensity of the coughing and Hippocrates recommends purging for epilepsy as he considers it a build up of phlegm in the brain (Hippocrates, 400BCE). K'eogh (1735) says *Pilosella officinarum* is *"good against the spitting of blood, all kinds of flow, cough, ulcers of the lungs, mouth and eyes and shingles"*. Potter's Encylopaedia (1907) mentions it as a drawing herb and also for whooping cough. Today, we know that *Pilosella officinarum* is excellent for whooping cough and also for brucellosis. The plant is also diuretic (Bishop, & Davy, 1994).

Bríd Ní Mathúna from Meall Uí Coráin, Bréan Tráigh (folklore notebooks), tells us that the fairy thimble is a cure for the heart. The T. O'Cuinn manuscript of 1415 tells us that the flower of the fox glove *(Digitalis)* can be used for tightness of the chest but that it should be boiled in wine. The Irish name for it is *Lus na mBan Sídhe* (Maloney 1919). A Dr Green in the 19th century received information from a local source in Co. Clare about the use of Hawthorn fruit for 'dropsy' (Kingston, 2007). He built a very successful practice on this information but kept the knowledge to himself. After his death, his daughter revealed his 'cure' and research on hawthorn since then, has shown it to be effective for cardiac failure in many circumstances (Furey & Tassel 2008).

WELLS, CHARMS AND INCANTATIONS:

The folk cures mentioned also include wells, charms and incantations.

This is a part of the Irish Herbal Physician (*Liaig*) legendary tradition. At the second battle of Moytura (Gray, 1983) the mortally wounded warriors were placed in a well named *Slaine*. This battle is recorded in the legendary history of Ireland and according to the *Lebor Gabála* the fall of Troy also occurred about this time. Four legendary physicians, Dian Cecht, his two sons Octriuil and Miach, and his daughter Airmed, surrounded the well. They chanted spells and incantations over the water and each warrior emerged healed and rejuvenated, ready for the next day's battle. In the Folklore notebooks for the Drimoleague area there are repeated references to a *Tobair na Súil* for eye complaints. P.J Mc Holley, from Creagh national school tells of a well in the townland of Highfield. This was reputed to cure deafness if one gathered ten stones, walked around the well ten times, throwing a stone into well each time. When the ten trips around the well were completed, one was to wash ones' ears with a rag and hang it on a bush near the well. Herbal baths, which were highly valued by the ancients, are not completely forgotten today. Dioscorides (1st century A.D..) and Galen (circa 130—200 A.D.) recommended aromatic baths for urological and genital disorders, as well as for tumours, wounds, colds, bad mood, and fatigue (Salmela, 1995).

Modern science proves that bathing can relieve muscle tension, dilate blood vessels, and slow the heart rate. Herbs can contribute to these benefits. Bathing with infusions of fragrant herbs used traditionally to treat many diseases, may eliminate physical and mental tiredness, and is beneficial for the skin and hair (Alakbarov, 2003).

The importance of sound in treatment is echoed in the Ayurvedic (Indian) tradition where the use of incantation while treating a patient is still widespread (Paul, A. personal communication, 2008). Ibrahim et al (2007) in their research on the treatment of mental illness among the The Gwandara people of Sabo Wuse in Niger State in Nigeria mention that incantation is an integral part of its treatment and though we may be unsure how this method works *"the fact still remains that most of the patients get relief."*

The knowledge contained in the Folklore Commission notebooks was widespread among the people. Child after child in parish after parish repeat similar 'cures' and this information was acquired in the home.

SPECIFIC CURES

There are specific cures in some families. This could be a cure for shingles, brucellosis, sprains etc. This knowledge is transmitted through the generations and is not passed outside the family. As recently as 2007, I was given a pot of ointment from 'some one who knew some one' for the treatment of intractable shingles. The person who received it said it was the only thing that 'worked' and it is testimony to the riches contained in our herbal tradition. The knowledge of each cure is specific to a person within the family and passed on through the generations. An entry in the folklore notebooks mentions that

> *"John Milliard, The Rock, Drimoleague, was supposed to be able to compound a mixture for curing sore eyes. Unfortunately, the cure seems to have died with him."*

The following entry came from Máire De Búrca, Creagh National School (Folklore notebooks):

> *"There was a man lived in Baile-macranach, Crioch, Co. Corcaighe named Seán De Búrca and he had a charm for liver complaints".*

The tragedy is that so much of this information is obliterated with death, as the knowledge is never transmitted outside the family. If there is no immediate heir, the knowledge dies. Also, with increasing urbanization, many Irish people have no time for such 'cures', preferring modern biomedical treatment instead. This shift to urbanization may also mean that the guardians and holders of such 'cures' do not see their significance in the Irish herbal tradition. These specific cures seem to be characterized by complexity as distinct from the 'simples' in general use and mentioned in the folklore notebooks. Compound cures are characterized by an increased number of herbs and possibly a complex method of preparation. They would therefore have not spread generally among the community. Also, they would be specific to a serious illness rather than to an everyday indisposition.

EFFECT OF ENGLISH COLONIZATION

I propose that it is possible to deduce how this transmission of specific cures came about. The profession of the *Liaig* was destroyed with the success of the English colonization. Many of those in the upper echelons of the *Liaig* profession went abroad with the rest of the Irish aristocracy and were stripped of their lands at home. One example of their new

social situation may be seen in the career of Owen O'Shiel of the famous O'Shiel medical family. He went to Paris in 1604, three years after the battle of Kinsale. He studied medicine there but considered it *"somewhat lax at and favourable in the conferring of graduation"*. He went to Louvain where he stayed for three years and from there to Padua where he received the degree of Doctor. He returned to Flanders and was appointed chirurgeon doctor to the army of Albert and Isabella, joint sovereigns of the Low Countries. He became chief of the medical faculty in the Royal Hospital of Malines and he worked there until 1620. In that year he returned to Ireland and settled in Dublin. He achieved fame as a Doctor and was surgeon-in-chief of the Leinster forces under Preston. By 1646 he had transferred his services to Owen Roe O'Neill and was found among the slain between Letterkenny and Schearsaullis (Maloney, 1919). This career is very different to that of his forebears in Ballyshiel who would have had a separate seat assigned to them at the royal banqueting table as well as having equal rank with the Aireach Ard (landowner). This would have entitled him to 20 retainers, 10 of whom paid him tribute. The *Liaig* enjoyed high legal status – being one of the Gaelic learned orders- in society, and were supported by the hereditary tenure of lands that were granted to them by the Chieftains in exchange for medical services. This was to ensure that they

> *"...might be preserved from being disturbed by the cares and anxieties of life, and enabled to devote himself to the study and work of his profession"* (cited by Burroghs Wellcome, 1909)

Other émigrés who fared better were Niall O Clacán (died1655) from Donegal who trained in medicine in the old Gaelic tradition. He became Professor of Medicine at Toulouse and Bologna. He was also physician to Louis XIII of France and published a 13-volume medical work called *Cursus Medicus*. The University of Bologna, where he taught, holds several Irish manuscripts (Beresford Ellis, 1999). Brian Connor, who trained as a physician in Co. Kerry became physician to King Sobieski of Poland circa 1618. William O'Meara became physician to Napoleon (Sheehan, A. Personal communication, 2009).

The *Liaig* of lower rank who stayed - or could not leave- suffered also. Previously, they enjoyed the same privileges as workers in precious metals and smiths but in the maelstrom of 17th-century politics they would

have lost everything. This would have included the *luibh gort* or local herb garden. The Gaelic laws required that the *luibh gort* supply the medicine for the local people. The *luibh gort* was gone with the new political order. As their political situation deteriorated, their knowledge would have been passed among the people and would have changed from a learned corpus to one that was in general use. That this local knowledge of herbs was still widespread in 1726 can be seen in Threlkeld's *Synopsis Stirpium Hibernicarum* in which he speaks of sheaves of sea wormwood being brought from the coasts of Meath and Louth and of women selling wood sage, betony, and kidney vetch in Dublin. The *Liaig* who would previously have earned his living from treating people had no job by the time the new ownership of the land was in place. Under the penal laws, no Irish person could practice a profession or receive an education. This in effect meant that the *Liaig* was not allowed practice his craft. It does not take long in perilous times for written knowledge to disappear when reading and writing are forbidden. There is no way that the extensive knowledge of the father can be transmitted in total to his children, so the only option is to transmit as much as possible of it orally and disseminate it among the people. The complex herbal compounds needed for the more difficult diseases were probably passed from father to son or daughter and the duty to care for the ill was fulfilled in as much as it was possible to do so in those dangerous times. It was the very opposite to what J.B. Van Helmont (1577-1644) wrote in his *Confessio Authoris* about medical care in the old Gaelic society:

> *"For I remember the Chieftains of Ireland used each to give a piece of land to a healer who lived with them; not one who came back trained from the universities but one who could really make sick people well. Each such healer has a book crammed with specific remedies bequeathed to him by his forefathers. Accordingly, he who inherits the book inherits also the piece of land. The book describes the symptoms and ailments and the country remedies used for each, and the people of Ireland are cured more successfully when ill, and have generally far better health then the people of Italy."*

The loss of land, the loss of legal status and protection, the gradual loss of reading and writing, meant the *complex remedies* contained in such family tomes were lost. I am not speaking here of the corpus of

medical manuscripts written in the period from 1400 to 1700 which were for the most part translations of Latin texts into Irish for the benefit of students at the medical schools. I am instead speaking of the personal journals that Van Helmont speaks of in his *Confessio Authoris*. Individual *Liaig* would have inherited these from their forbears, with each generation adding their experiences to it. These books would have been an adjunct to their formal medical training which was quite extensive and prolonged. To reach the status of *Ollamh*, which was the highest level of training, involved many stages and there was considerable stress on memory work. It was only after passing the final stage that a person would attain the title of *ollamh* which was the highest degree. Seven years was the minimum time required in study, and to reach the higher levels required much longer. The final examination entailed submission of the student's work to an *ollamh* who was externally appointed and who had to report to the king on the suitability of the candidate for the award. This report also included the student's general character and whether he was an upright member of the community. Not until all parts of the report were favourable would the king grant the award of *ollamh* to the student. One could infer from this that the examining *ollamh* was more than careful in his recommendations as it would reflect back on his judgment later on if the new graduate turned out to be careless and dishonourable. Each qualified *liaig* kept four students or graduates to whom he taught his methods and they accompanied him on house visits. They in turn paid him a fee and assisted him in his work. The Brehon laws are quite specific as to the obligations of each:

> *Instruction without reservation, and correction without harshness, are due from the master to the pupil, and to feed and clothe him during the time he is at his learning."*

The obligations of the apprentice lasted for a lifetime as the same law continues:

> *"To help him against poverty, and to support him in old age [if necessary], these are due from the pupil to the tutor."*

CUPPING

Cupping was one of the therapies practiced by Irish *Liaig* and it was practised using an instrument called a *gipne*. This is explained in *Cormac's glossary* as the leech's 'cupping horn'. A case is recorded in the Acallamh where a leech named Bebhinn had the venom drawn from an old unhealed wound on Cailte's leg by means of 2 fedans /tubes and by this method was the leg healed. The fedans that she used were those of Binn, the daughter of Nudarn who was also a doctor (Joyce, 1903). An entry for the Drimoleague area in the folklore notebooks mentions the following for the extraction of a thorn:

> *"Thorns were extracted in the following way – a bottle was filled with boiling water and then emptied – and so the bottle was filled with warm air – the neck of the bottle was then held over the thorn and pressed down on it. As the air within the bottle cooled and contracted the thorn was drawn out by suction (John O'Leary)."*

The capacity of the knowledge to survive, albeit in a very reduced form, also points to its effectiveness in the treatment of illnesses. It is an incredibly ancient therapy used in all traditional medical systems. The Ebers Papyrus (1550 B.C) from ancient Egypt, states that wet cupping removes foreign matter from the body. Hippocrates and Galen supported its use and it remains an important therapy in Unani medicine today. Charles Kennedy (surgeon) wrote in 1826:

> *"The art of cupping has been so well-known, and the benefits arising from it so long experienced, that it is quite unnecessary to bring forward testimonials in favor of what has received not only the approbation of modern times, but also the sanction of remotest antiquity"* (Osborn, 2008).

SWEAT HOUSES

The ease with which the present generation has adopted the sauna and spa may be due to the fact that sweat houses were part of the treatment for rheumatism. They were known as tigh 'n alluis [allus = sweat] and were still being used up to the 1930s. They were mainly found in the north west of Ireland with Leitrim having 97 sweathouses and at least 19 in Co. Cavan. There are two in Co. Cork and one in Co. Wicklow (Harte, 2008). They were built entirely of stone and were 5–7 feet long inside with a very low door through which to creep. They were situated away from habitation and near a pool of water of approx 4–5 feet deep.

A great fire of turf was kindled inside until the house became heated li an oven. The embers and ashes were swept out and then water w splashed on the stones and this produced a thick warm vapour. A pers wrapped himself in a blanket, crept in, sat on some sods and then t door was closed up. He remained there until he was sweating free After that he plunged into the pool outside after which he was rubb briskly until he was warm again. Next he was encouraged to medita (*dercad*) so as to help achieve a state of peace (*sitcha/in*).The patie may have had several baths over a period of days after which he w generally cured. This method was frequently used for rheumatis (Joyce 1903). Anthony Weir (1989) disputes this use however and su gests that they may have been used for inducing a state of expanded co sciousness by the ingestion of *Psilocybe Semilanceata.*

MEDICAL FAMILIES

The pinnacle of care, education and professionalism lay within th hereditary medical families. The chief medical families are named i Table 1.

TABLE ONE: Physician families

Munster

Ó Callanáin (Callanan),
Ó hÍceadha (Hickey)
Ó Leighin (Lane),
Ó Nialláin (Nealon),
Ó Troighthigh (Troy);

Leinster

Mac Caisín (Cashin),
Ó Bolgaidhe (Bolger),
Ó Conchubhair (O'Connor),
Ó Cuileamhain (Culhoun, Cullen);

Connaught

Mac an Leagha (Mac Kinley)
Mac Beatha (Mac Veigh),
Ó Ceandubháin (Canavan),
Ó Cearnaigh (Kearney),
Ó Fearghusa (Fergus),
Ó (or Mac) Maoil Tuile (Tully, or Flood),

Ulster

Mac (or Ó) Duinnshléibhe (Donleavy),
Ó Caiside (Cassidy),
Ó Siadhail (Shields).

Ó hÍceadha (Hickey) and Ó Leighin (Lane) mean literally healer and leech respectively. How many people with the above names today, realize that they are descendants of the great Irish hereditary medical families? There was a well known bonesetter by the name of Lane in the Newmarket area of Co. Cork in the latter half of the twentieth century and it would be an interesting genealogical study to investigate if that family is descended from the old Irish medical family of the same name who resided in the Blarney area. These families were involved in the transmission of medical knowledge over many generations and Van Helmont's statement, illustrates how effective they were in their stewardship. The kings and great Irish families had herbal physicians attached to them (Table two). This was the most sought-after position as it was well paid in land, status and remuneration. A tract of land of up to 500 acres was not uncommon and this was held free of all rent and tribute. In the case of the O'Shiels, their hereditary estate near the village of Ferbane, is still known as Ballyshiel. As already seen with Owen O'Shiel, many of the *Liaig* left Ireland to train in the European model after the Battle of Kinsale. The *O'Cassidy* family was another famous medical family. The *Annals of Ireland* mention the deaths of five of the *O'Cassidy family,* namely, Finghin (d. 1322); Gilla na nAingel (d. 1335); Tadhg (d. 1450); Feonis (d. 1504) and Feidhlimidh (d. 1520) and notes that they were *ollamh leighis*. An Giolla Glas Ó Caiside is identified with the authorship of a medical manuscript between 1515 and 1527 which is now in the library (along with many more) of Corpus Christi College, Oxford (1517).

Physicians of a lower rank would have lost their profession in the new political order also. The following table lists some hereditary physicians and the families to whom they were attached.

TABLE TWO: Some hereditary physicians/liaig and the families to whom they were attached.

PHYSICIAN /LIAIG	TO
O'Callanan	MacCarthys of Desmond
O'Cassidy	Maguires of Fermanagh

O'Lee	O'Flahertys of Connaught
O'Hickey	O'Briens of Thomand
	O'Kennedys of Ormond
	Macnemaras of Clare
O'Meara	Butlers of Ormond
O'Shiel	MacMahons of Oriel
	MacCoghlans of Delvin
O'Troightig	O'Sullivan Beara

MEDICAL SCHOOLS

About a mile west of Culahill Castle, the medical school of Aghmacart developed under the patronage of the Mac Giollapadraig dynasty. King James I instituted a plantation of the area of Upper Ossory in 1626 and the political turmoil affecting the Fitzpatric family at this time may account for the fact that though the school was well established by 1500, it is not heard of after 1611. This is similar to the other medical schools, some of which were flourishing in the early years of the 17th century but all of them had ceased by the 1650s (Ní Dhonnnchadha, personal communication, 2009). This school reflects the hereditary nature of the medical families but in a broad extended sense. The physicians involved in this school were the Ó Conchubhair family.The weary work of transcribing Latin texts into Irish can be seen in Risteard Ó Conchubhair's comment as he finished the task of transcribing Bernard of Gordon's (1258-c. 1320) *Liber Prognosticorum.*

> *Finis. I am Richard, son of Muircheartach, son of Tadhg... O Conchubhair, who by permission of God wrote this* Prognostica *of Bernardus, in the school of my kinsman and master, Donnchadh Og Ó Conchubhair, namely the chief Master of Medicine of Mac Giollapadraig. And Achadh Mic Airt is my place of writing. And out of the book of Fearghus Mac Bheathadh it was transcribed. Today is April the first 1590. Jesus. Maria.* (Nic Dhonnchadha, 2006).

There is a lot of information in this quotation. The *Finis* is written with almost a sense of relief and we know exactly who he is *"son of Muircheartach, son of Tadhg..."*We learn that the chief *Master of Medicine* is none other then his kinsman *Donnchadh Og Ó Conchubhair,* that the work was undertaken in the medical school of Aghmacart. We

also learn that the owner of the book from which he transcribed belonged to *Fearghus Mac Bheathadh* and that the transcription was finished on April 1st 1590.

When he had completed the transcription of another text on October 30th 1590 in Pollardstown, Co. Kildare he also describes Donnchadh Og as

> *'chief physician of Ossary and the best of the doctors of Ireland in his own time- and that without leaving Ireland to study'.*

This brief account of some of the work done in Aghmacart tells us that medical schools were patronized by the chieftains, that the *ollamh liaig* were interested in obtaining the latest knowledge from the continent; that new knowledge was passed generously to colleagues and finally that obtaining one's medical education solely in Ireland was no bar to advancement to the most sought-after position, namely that of physician to the Chief. When transcribing European texts, the Irish scholar did not do so unquestioningly but interweaved knowledge from many sources so as to blend them flawlessly into a new text for the betterment of their students.

TREATMENT AND MAINTENANCE

The *Bróinbherg* or *House of Sorrow* is associated with the Red Branch Knights and consequently outside of recorded history. The Brehon Laws however, give the legal requirements for the local hospital, maintenance and treatment. These hospitals were secular and were distinct from any hospital attached to monasteries. The latter were governed and managed by the monastic authorities. The secular hospitals were for the use of the people of the area and were called *foras tuaithe* or 'House of the territory'. Water, cleanliness and ventilation were the three main requirements for the *foras tuaithe* and it had to have four doors open, one to the north, to the south, to the east and to the west *'so that the invalid may be seen from every side*. Water was to be in the form of a stream running through the middle of the floor. The care of the sick could also be carried out in private houses but water, cleanliness and ventilation were still a requirement. The treatment of a sick man could not be carried out in the house of the man who injured him, in a place where the sick man was revolted by its dirty condition or in a place

where the sick man felt further injury may be done to him. Other place prohibited were places

> *'Where sea or waterfall or cliff dazzles or where there are wont to be pigs or the bleating of sheep in spring...'* (Binchy 1938)

People who could afford to pay for treatment were expected to pay but if unable to do so there was a levy put on the district to cover the cost. If the person's illness/injury was caused by another, then that person was liable for all the costs of treatment and maintenance. The *Bretha Crólige* (Binchy, 1938), a law tract which has been placed in the first half of the eighth century gives detailed requirements about the obligations regarding maintenance of the sick and compensation in the event of injury. The cost of maintenance and fees due to the *liaig* is also carefully laid down. Some people were not allowed to be brought away on sick maintenance i.e. a young girl before the age of consent and an old man over the age of eighty eight. In these instances food and treatment had to be brought to their place of abode. The text also tells us that there are three errors in nursing; the error of leaving the victim without food, the error of leaving him without the *liaig*, and the error of leaving him without a substitute. The problems associated with the latter, namely loss of income, is also mentioned in this tract:

> *'There are seven sick maintenances most difficult to support in Irish law [in the territory]: maintenance of a king, maintenance of a hospitaller, maintenance of a poet , maintenance of an artificer, maintenance of a smith, maintenance of a wise man, maintenance of an embroideress. For it is necessary [to get] somebody to undertake their duties in their stead so that the earnings of each of them may not be lacking in his house'.*

Boys between the ages of fourteen and twenty were accompanied by their mother and she also stayed with her child if she was still breast-feeding.

Every patient was to be fed according to the directions of the *liaig* and the basic fare was two properly baked loaves of bread every day plus different condiments depending on the rank of the patient. Unlimited celery was given to patients of every social rank due to its healing properties and garlic was also recommended. Honey is approved of in one part of the text and forbidden in another section. Fish or flesh cured with sea

salt and horse salt were generally forbidden but not to the noble grades who were allowed it every day from New Year's Eve to the beginning of Lent and then twice a week during the summer. Fresh meat was to be given to every one but how often is not clarified. Boys and girls between the ages of seven and ten were entitled to the fare they would receive while in fosterage. The *Bretha Crólige* gives the legal requirements of treatment but not the details of the therapeutic regime. It is highly unlikely that garlic was given to everyone without question as garlic would be injurious to those of choleric temperament (O'Cuin, 1415). There were also many leper hospitals but these were generally connected with the monasteries and such institutions until they were suppressed under Henry VIII.

It can be seen that in recorded time, Ireland had a professional class that practiced and transmitted the knowledge of herbal medicine effectively and successfully. The success of Irish *liaig* in Europe in the 17th century testifies to their skill and expertise.

By delving back in to the mythological era and beyond recorded history, we see that the skill and prowess if the *Liaig* is no less diminished.

EARLY INHABITANTS OF IRELAND

The *Lebor Gabála Érenn* (LGE) is an important record of the folkloric history of Ireland including its medicine. It was compiled and edited by an anonymous scholar in the 11th century. It traces the lineage of the Gaels from Egypt to Scythia, to Spain and finally Ireland (Macalister, 1938).

MEDICINE IN THE MYTHOLOGICAL PERIOD

Mach Mong Ruadh, the daughter of Aed Ruadh is credited with establishing the first hospital in Ulster (Keating, 1632). It was called Broin Bhearg (House of Sorrow) and was used by the Red Branch Knights. It also served as a royal residence until its destruction in AD 322. (Wilde).

Among the Tuatha Dé Danann was a physician called Dian Cecht (Joyce, 1903) which means God of Health (Cormac's *Glossary*). He had seven children, among them Miach and Airmed who were also herbal physicians and surgeons. He had a grandson called Lugh who was the crowning glory of the Gaelic pantheon. Lugh had a magic spear that so thirsted for blood that outside of battle it was kept at rest by steeping its head in a sleeping draught of pounded poppy leaves. The Irish name for

P. somniferum, the common opium poppy is codalian, from codal or ca meaning sleep (Cameron, J).

Even today, the major alkaloid of the opium poppy is the narcotic an gesic, morphine which is of such benefit to those in severe pain.

Herb baths were used for healing the warriors' injuries at the end battle and these baths were never attacked.

The milk of hornless cows was also used to neutralize the poison wounds received by the army of the king of Leinster and the soldie were healed of the poison as soon as they entered the baths (Keatin 1632).

NUADA'S ARM

In the story of Nuada's arm we see a sense of humour as well as gre skill. At the end of the battle of Moytura, the King, Nuada, lost his ar and with such a blemish he could not retain the office of King. Dia Cecht made a prosthesis of silver to replace Nuada's hand. This was skillfully made that all the joints moved and it was as supple as a re hand. However it was not enough to maintain the kingship and a ne king was invited to rule over them.

The new king became a dictator and all the subjects suffered. At thi point in the saga Dian Cecht's son, Miach and his daughter Airmid cam to visit the deposed king, Nuada. There was a porter at the entrance wh had only one eye. He asked the visitors who they were and they replie *"We are good doctors"*. He immediately challenged their skill by suggest ing they give him a new eye. They suggested that they could take one o the eyes of his cat who was sitting nearby and give it to him instead. He was delighted with this suggestion and they duly did what they had promised. Unfortunately for the porter the eye retained its cat like nature and tended to stay awake at night and sleep during the day. The porter duly reported this medical success to Nuada who commanded that they be brought to him. On entering, they heard the king groaning and noticed that the wrist had festered where the silver prosthesis joined the arm. Miach asked where the old hand was and was told it had been buried a long time ago. But he dug it up, and placed it to Nuada's stump; he uttered an incantation over it, saying: *"Sinew to sinew, and nerve to nerve be joined!"* and he healed it in nine days and nights. The first three days he carried it against his side, and it became covered with skin. The second three days he carried it against his chest. The third

three days he would cast white wisps of black bulrushes after they had been blackened in a fire (Gray 1983). The interesting part of this story is that he moved from tissue regeneration to nerve regeneration and it also shows an understanding of skin grafting. The use of incantation is not usually used today and it seems to be a therapeutic skill that has been lost other than in domestic life where one soothes a fractious child with sound.

ABILITY AND JEALOUSY OF DIAN CECHT

Dian Cecht was jealous of this superior surgery and struck his son's head with a sword. The blow was superficial and only cut the flesh. Miach healed it easily. Dian Cecht struck again and this time cut through to the bone. Again his son healed it and this so enraged Dian Cecht that he struck his son with a sword for the third time. This time the blow penetrated the membrane of the brain but again his son was able to heal it. Unfortunately for Miach, Dian Cecht assaulted him for the fourth time and succeeded in cutting out his brain. This time he died.

Dian Cecht buried his son and subsequently 365 herbs grew up through the grave corresponding to the number of his joints and sinews. His sister Airmed uprooted these herbs according to their properties and spread them out on her cloak. Dian Cecht mixed up the herbs so no one now knows their proper healing qualities (Meyer).

Even in this legend of Miach healing himself we can see his superior skill compared to DianCecht. In reply to a question from Lug asking him *"what power do you wield"* Dian Cecht replies

> *"Any man who will be wounded there, unless his head is cut off, or the membrane of his brain or his spinal cord is severed, I will make him perfectly whole in the battle on the next day."* (Gray).

However when Dian Cecht strikes Miach the latter was able to heal himself when the blow penetrated the membrane of the brain. In his reply to Lug, Dian Cecht acknowledges that he could not heal someone if the *"membrane of his brain or his spinal cord is severed"*.

Dian Cecht was known late into Christian times and his charms invoked at least until the 8th century. In modern folklore Dian Cecht's porridge is a cure for colds, sore throat, phlegm, and worms; it is made

of hazel nuts, dandelion, woodsorrel, chickweed, and oatmeal (O.U.P. 2004).

In the tales of the Red Branch Knights, medical treatment was the order of the day during battle and all the *liaig* were under the direction of Fingin Faithliaig who was the herbal physician to King Concobar. Each man carried a bag of medicaments slung from his waist and at the end of each day's battle they ministered to the wounded. This bag of medicaments was known as a *lés* and Joyce (1903) remarks that a *liaig* attempting to cure without his *lés* was like the companions of St Columba after his death...helpless.

DIFFERENT SKILLS

Chanted spells and incantations were used in the therapeutic regime and music was used also. Dagda's harp could play different kinds of music, sleep music, joyful music and sorrowful music. It was not within an individual's power to resist the effects of this music (Gray, 1983).

The use of sound to diagnose can be seen in the following story about the illness and treatment of Teige of Mackein, a Munster Prince, (Keating, 1632).

> Teige and the warrior Luigad- Laga were injured in battle and were carried to Tara to be cured. The leeches were induced to poison the wounds of both men but this was to be done slowly so that no suspicion should fall on the King of Meath. Small reptiles, portions of poisoned arrows and an ear of barley were secretly placed in the wounds of the 2 men. At the same time the leeches continued to treat the men as the poison was to work slowly. Luigad had an argument with the king and got so exceedingly angry that his wounds burst open and the poison was ejected. We are not told if he then left the hospital but that he recovered.
>
> Teige remained sick for a year until his own leech, Fineen, arrived from Munster with 3 of his most celebrated disciples. When they heard the groans of the wounded man, Fineen asked them what was the groan they heard. The first replied
> *'a groan from a barb'.*
> Fineen asked the question again and the second replied
> *'A groan from a living reptile'*
> Fineen asked the question a third time and the third disciple replied
> *'A groan from a poisoned dart.'*
>
> Thus the men from Munster discerned what was the real problem with Teige.
> They cured him by heating the coulter of a plough until it was red hot and applying it to the wounds
> *'made a dart at the wound of Teige and forth came the offending bodies'.*

Other skills practised can be deduced from the instruments they used. Among these were a horn called a gibne, tweezers, and a surgical probe (fraig). Suturing was done successfully as can be seen in the story of Conchobha Mac Nessa's head wound being sutured with gold thread.

As already mentioned, incantation and spells were used as well as astrological observations and 'healing stones' (Beresford Ellis).

The successful use of trefining by the herbal physician can be seen in the story of Cennfaelad. This unfortunate man had his skull fractured during the battle of Magh Rath in 637AD. He was taken to the medical school of Tomregan where the injured portion of the skull and a portion of the brain (brain of forgetfulness), was removed. He recovered so well that he became known as Kenfaila the Learned and is credited with founding the bardic college at Derryloran in Co. Tyrone (Joyce, 1903).

TODAY

It can be seen from the above overview of the recorded and mythological eras that the Herbal Physician or Liaig not only healed the sick and injured but that he also spent long years in learning his craft. The unqualified physician was deemed to be unlawful and had to tell the presenting patient that he was unqualified (Binchy 1939). There were sophisticated legal mechanisms in place to compensate those who were injured by another as well as social and legal instruments to facilitate the treatment and care of the community. The great tragedy was that the hereditary nature of this knowledge meant that the complexity of its therapeutic regime was not disseminated widely and disappeared almost to the point of obscurity in the 17th century. In that political upheaval individual families kept the complexity and skills alive as can be seen today in families with specific cures or skills, acquired by inher-

itance.

We have now the chance to reclaim our diminished tradition. For the first time since 1650, Irish men and women can train as a Liaig (Herbal physician) in the old manner. The 4-year Herbal science degree in Cork Institute of Technology takes the best of what is available from the old manuscripts and grafts it on to the best of knowledge from current scientific research so as to give the graduates a thorough understanding not only of the history behind the Irish tradition but also the science underpinning it. Building on this undergraduate knowledge with an externally validated M.Sc training in clinical herbal medicine is where the new graduate learns not only the skills of the past but also the best of modern clinical competencies.

This long and necessary training is an acknowledgement and thanks to our forefathers who developed such a highly trained and skilled profession in this country for the benefit of their patients and society. It is also an acknowledgement to Profs O'Reilly, M. Maloney, T. Foley and S. Sheehan who laboured so hard in the first half of the twentieth century to bring this illustrious Gaelic profession into its full continuum of activity so that the knowledge emanating from it, may benefit research, horticulture, manufacturing and medicine.

REFERENCES

Alakbarov, Farid. Aromatic Herbal Baths of the Ancients. *HerbalGram*. 2003; 57:40-49. American Botanical Council.

Beresford Ellis, P.B. 1999. *An Phoblacht*. 'Untilled Fields of Irish History'. 30/09/1999

Beresford Ellis, 2003 *The Celts*. Constable & Robinson, London.

Binchy, D A. 1938. Sick Maintenance in Irish Law. *Ériu* 12: 78 -134

Bishop, G. F.; A. J. Davy (March 1994). "*Hieracium Pilosella* L. (Pilosella Officinarum) *Journal of Ecology* 82 (1): 195–210.

Burroghs Wellcome 1909. *Medicine in Ancient Erin*. British Medical Association, Belfast.

Cameron, J. *Names of plants (Scottish and Irish):* Available at www.archive.org/details/gaelicnamesofpla00came

Collins, A.F. 1947 *collection of Crude Drugs'* C.J. Fallon ltd. Dublin

Cormac's Glossary: available at www.archive.org/about/about.php

De Burca, ed. 2000 *Annals of Ireland by the Four Masters*. De Burca, third edition 2000, Dublin.

Fleetwood, J. 1983. *The History of Medicine in Ireland*. The Skellig Press, Dublin.

Franchimont P, Juchmes I, Lecomite J. Hydrotherapy: Mechanisms and indications. *Pharmacol Ther* 1983; 20:79-93.

Furey A, Tassell M, Towards a systematic scientific approach in the assessment of efficacy of an herbal preparation: Hawthorn(*Crataegus spp.*), Eur. J. Heart Fail.(2008) doi: 10.1016/j.ejheart.2008. 10.003

Gray, E. Editor and translator.1983. *Cath Maige Tuired: Second Battle of Mag Tuired,* Irish Texts Society, Dublin

Harte, A. 2008. *Journal of the Kerry Archeological and Historical Society*. "A Sweathouse at Caherlehillian, Co. Kerry". Series 2 volume 8. p. 114.

Hippocrates, 400 BCE Adams, F. Trans. *On the Sacred Disease* Available at www.shaktitechnology.com/hippocrat.htm

Ibrahim, J.A. Muazzam, I. Jegede, I.A. Kunle, O. F. Okogun, J. I. Ethno- medicinal Plants and Methods used by Gwandara Tribe of Sabo Wuse in Niger state, Nigeria to Treat Mental Illness. *African Journal of Traditional, Complimentary and Alternative Medicines, Vol.4, No. 2, 2007, pg. 211-218*

Joyce, P.J: 1903. *A Social History of Ancient Ireland*. Longmans, Green & Co. London.

Jude/ Foley, T. 1933. *Medicinal and Perfumery Plants and Herbs of Ireland*. Gill & Son, Dublin

Khalid Hussain Janbaz. Anwar-ul Hassan Gilani 1995. *Journal of Ethnopharmacology*. Evaluation of the protective potential of *Artemisia maritima* extract on acetaminophen- and CCl_4-induced liver damage. Vol 47 Issue 1 43-47.

Keating, G. circa 1632 *The History of Ireland* English translation available at www.ucc.ie/celt/publisher/100054/

Keogh, J. 1735. *An Irish Herbal*. Ed. Michael Scott. 1986 Aquarian Press, Northamptonshire.

Kingston, R. 2007 *A phytochemical analysis of selected constituents of Crataegus flos. and fruct. to determine whether ethanol, whiskey and brandy solvents affect the chemical constituent profile of the herbal preparations*. M.Sc thesis, Scottish School of Herbal Medicine.

Koda H, Hossain SJ, Kiso Y, Aoshima H. 2003. Ageing of Whiskey increases the the potentiation of GABA (A) receptor response. *J. Agric Food chem.* AU27; 51 (18); 5238-44

Lawless J. 1995. An Illustrated Encyclopedia of Essential Oils: The Complete Guide to the Use of Oils in Aromatherapy and Herbalism. Element Books, Boston.

Macalister, R.A.S. ed.and trans. *Lebor Gabála Érenn* 'The Book of the Taking of Ireland',part 1. Irish Texts Society, Dublin, 1938.

Maloney, M. 1919. *Luibh-sheanchus. Irish Ethno-Botany and the evolution of Medicine in Ireland.* Gill & Son Ltd. Dublin.

Merlin. M.D. Archaeological Evidence for the Tradition of Psychoactive Plant Use in the Old World. *Economic Botany* 2003. 57(3):295-323

Meyer, Kuno. De Arreis, ("Na Arrada") *Revue Celtica* xv. Dublin.

Murphy, M. 1991 *An Irish Materia Medica.*(trans.) Dublin Institute of Advanced Studies.

Nic Dhonnchadha, A. 2006. The Medical School of Aghmacart, Queen's County. *Ossary, Laois and Leinster.* Vol.2. OLL, Ráth Oisín, Crosspatrick, Co. Kilkenny.

Nic Dhonnchadha, A. Medical Writing in Irish. *Irish journal of Medical Science.* Volume 169/3 (July-September 2000) 217-20

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O'Curry, E. 1971 edition. *On the Manners and Customs of the Ancient Irish.* Williams and Norgate

O'Reilly, J. 1933. *Studies.* Essential Oils and Medicinal Herbs. Vol. XX11, No 87. pages 373 – 388.

Osborn, DK. 2008. www.greekmedicine.net/therapies/Hijama_or_Cupping.html

O'Shea, K. 1914. *Charles Stewart Parnell, his Love Story and Political Life* Vol. II Cassell & Co, London.

Quinlan, C. 1919 *Common Plants used in Medicine* A. Thom & Co. Dublin.

Roberts, M.S. Walters, K.A. 1998. *Dermal Absorption and Toxicity Assessment*

Informa Health Care

Salmela DW. *The Sauna.* Minnetonka (MN): Otsa Press; 1995

Sheehan, A. 2009 Learned professions in Ireland in the 17th century.

Personal communication

Squire, C. 2003. *Celtic Myths and Legends*, Lomond Books, London.

Threlkeld, C. 1726. *Synopsis Stripium Hibernicarum.* 1998 edition. Boethius Press, Kilkenny.

Tibi, S. 2005. *The Medicinal Use of Opium in Ninth-Century Baghdad.* BRILL.

Weir, A. *Irish Sweat Houses and the Great Forgetting* www.irishmegaliths.org.uk/sweathouses2.htm

Wilde, W. *Notes on Ancient Ireland*

Wren, R.C. 1907 *Potters New Cyclopedia of Botanical Drugs and Preparations.* 1989 ed. C.W.Daniel Company.