

Paper to the Royal Botanic Gardens Kew.
October 1993

Good Afternoon Mr. Chairman, Ladies and Gentlemen.

It is a great honour to have been invited as a speaker to you today, it is the fulfilment of one of my greatest ambitions, made all the more exciting by being the first from my industry to do so.

As a hobby, and an obsession I would describe myself as a herbal archivist. That is to say, I collect information on natural plant material and then dissect it to see if there is any justification for the claims or reputation made on that plant. To date this is about 7-8,000 pages long, covers nearly 10,000 subspecies of plant, and includes medicinal properties, history, folklore, habitat, country of origin and most important the chemical composition.

I am not a botanist, nor a pharmacist, nor a pharmacognocist. I am a chemist who has had nearly a quarter of a century in the cosmetics industry as a cosmetic chemist, or to be posh I could say cosmetologist. I find this fits in quite well with work and it also gives me a good excuse for having a computer at home, and not having time to do the dishes.

I found a picture that best describes the way I feel some days, as I cart my data backwards and forwards. This plate comes from A Country Herbal by Lesley Gordon and is a travelling country apothecary depicted in an 18th century French print.

SLIDE ONE P.67

I am hoping that computerisation will reduce my load to something more manageable. In keeping with the creativity of technical people you will no doubt notice the use of the floppy disks as ear warmers.

SLIDE TWO Cover

But between you and me, things look like getting worse. And I could see me being told to pack my bags and to take my home made wine with me!

SLIDE THREE P.43

The use of flowers as emblems or florography, let's call it by the romantic name of the language of flowers, was fashionable in the Middle Ages. It was used at a time when the need for a chaperon meant that messages had to be passed secretly and discretely. I would like to start my lecture with a simple bouquet of a few flowers. These would include

Burdock for persistence - I shall not be discouraged. Cineraria for delight - I enjoy being in your company.

Nasturtium for affection - I prefer natural looks and charm.

and

Begonia - WARNING, we are being watched!

I believe that much of the published information is poorly researched and over copied. I further believe that we are in danger of losing much of our knowledge unless a conscientious effort is made to draw the information together and sort out the fact from the fiction.

I am absolutely convinced that the bounty of nature offers real benefit for cosmetics and toiletries, whilst offering an honest profit.

There are a number of manufacturers who make a dishonest profit by using levels and quality of plant extract that would have no beneficial or medicinal value whatsoever. This drive - for cash at any cost - will of course be killing the goose that is laying the golden egg, and destroy the justifiable faith that the consumer is placing in natural products.

Rudolf Fritz Weiss says that bibliographical proof is an acceptable means of satisfying the efficacy of a plant material, provided that such proof includes the positive and negative reports. My approach to natural materials is through exhaustive surveys of the literature and weighing up the pros and the cons.

The Alexandrian sage Jesus ben Sirach coined a phrase some two thousand years ago that roughly translated, reads:- "God created the plants that heal, and a sensible man will not despise them". I fully believe in that sentiment and will attempt, in the short time available to me, to make an optimistic case for the future.

Let us look at the reasons behind the future success of these natural materia medica, and what evidence exists.

There are three main criteria.

Firstly, the historical evidence - which I shall be discussing in a minute.

Secondly, the geographical and cultural evidence, which includes folklore and old wives' tales, and...

Thirdly, the modern scientific evidence for the value of herbs and extracts.

To see where it all began, let us go back in time to the dawn of Man. Picture the somewhat harsh environment where the women collected and foraged for wood and edible plant material, cared for the children and prepared the food. The men were the hunters and did the heavy work.

This I hasten to add is not male chauvinism, this was the reality! It can only be presumed that even in the earliest of ages of man, the knowledge of plant material extended beyond the edible and that some medicinal virtues must have been known.

Later, indeed much later, man began to domesticate his cattle and began the rudiments of farming.

The new society, more cooperative and efficient, brought about new needs for the people. The need to forecast the seasons and to know when to plant the crops, sowed the very seeds of early religion. With religion came the ceremonies and rituals, many of which depended on the use of plant material for their incense and for their offerings.

Herbalism must have worked, since the very lives of the herbalists would have depended on the success of their art. The dosage rates of plants such as Belladonna, Henbane, Hellebore, Aconite and Monkshood are critical. Too little and the remedy is ineffective, too great and a paying client is lost forever!

Neighbouring settlements traded in ideas and information, with more plants being added to the growing list of remedies and cures. Remember also, that their skill was not restricted to the purely medicinal areas of wounds, coughs and colds. They were also in great demand for aphrodisiacs and love philtres. It is also to be expected that they would have been asked for abortients and douches as drastic solutions to these potions.

With growing communities and the herding of people and animals would come disease. The day of the herbalist had arrived.

In these early days of plant medicine, the story would have been the same, whether in the land of the Incas, in an early dynasty of China or in the great pharaonic period of Egypt. The events of herbal development would have followed much the same path, albeit that they were many thousands of years and many thousands of miles apart.

The most dramatic event to occur was the advent of the written word, a time when spoken teaching could be supplemented and at the same time be transmitted over greater distances. It was an era when each of the great civilisations produced the very foundations on which modern medicine and cosmetics were to be built.

The Ebers papyrus is one of the earliest medical documents in existence. Even today we are trying to relate the hieroglyphics to the actual plant material.

It is an exercise that will occupy botanists, herbalists and archaeologists for many generations.

Don't think for a minute that the ancient Egyptians had discovered all the secrets, or that their definition of natural material was restricted to plants and flowers.

Let me give you an example (which I have taken from the Egyptian Herbal by Lise Manniche).

From a reference in the Ebers papyrus (1550 BC.) there was a hair tonic prepared from a red mineral, Myrtle (**Myrtus communis**), kohl, oil or fat; gazelle dung and hippopotamus fat.

Not the most appetising mixture I hear you say! However, myrtle has a most wonderful and powerful scent if extracted properly. It was used in the last century in a fragrant preparation known as Eau d'Agnes. In addition, Myrtle is a powerful extract for skin eruptions, eczema and sores and so would have been an ideal choice for an hair tonic.

Gazelle dung, though abhorrent to our culture, is rich in numerous enzymes and bacteria which could work in ways unknown to modern man. The smell would be no worse than, say, civet or musk, which were widely used in modern perfumery up until quite recently.

As to the hippopotamus fat, the cosmetic world was using spermaceti and whale oil in this decade.

All at once the formula doesn't look quite so silly any more.

But let us stay in this fertile land a little while longer.

The ancient Egyptians discovered that plants contained elements that today would be described as antimicrobial, antioxidant and preservative. They used this technology to excellent effect in their embalming, a secret that we have yet to completely unravel.

In their incense they discovered that blends of natural oils and plant material produced states of euphoria and could lift the mood. One blend in particular called Kyphi, was a blend of some sixteen materials and was burnt in the temples. It is a formula that has survived through to today, thanks to the writings of Pliny and Theophrastus.

Don't tell me that osmotherapy is new! Quite simply, we have forgotten how to use the most powerful sense that we were born with.

It was known that anointing the body with oils was both pleasurable and beneficial. Aromatherapy was known before the birth of Christ, and yet it has taken centuries for this ancient art to be rediscovered. It will take another decade before it achieves the wide recognition and acceptance that it deserves.

The ancient Egyptians did not get everything right. Their use of cadmium, arsenic, plumbic and mercuric salts to achieve colour in their cosmetics was a deadly mistake. However, their understanding of Henna as a hair dye and nail colorant was safe and very sound.

But we have stayed too long in the fertile and fragrant land along the Nile, it is time to move to another time and another culture.

Now I am sure that many of you are quite mystified by the plethora of weird and wonderful ingredients that go into your toiletries and cosmetics. So I wonder how many of you would like the Puppy Dog ointment concocted by an Englishman Gilbertus Anglicus, in the 15th. century. The recipe goes as follows:-

Take a very fat puppy dog and skin him; then take the juice of cucumber, rue and pellitory; berries of ivy and juniper; fat of vulture, fox and bear in equal parts; stuff the puppy therewith and boil him. Add wax to the grease that floats on the surface and make therefrom an ointment.

As recipes go, that is quite a complex mixture and we would have tremendous problems getting some of the raw materials, particularly the juniper berries which are only available for a relatively short season in the year.

Rue, pellitory and ivy are, of course, known skin irritants, and as a result, we would have to expect some potential customer complaints if we made this formula up today.

The major problem with this product would be the ingredient labelling for America, since I could find no listing in the CTFA Cosmetic Ingredient dictionary for Puppy fat.

Around about the 16th century there grew up the belief known as the Doctrine of Signatures. Basically, this meant that the plant itself gave some clue as to what it might treat medicinally, purely from its physical appearance.

Foremost among the defenders of the Doctrine of Signatures was Philipp Theophrastus Bombastus von Hohenheim (better known as Paracelsus), who said that we recognise the signatures instinctively: "The mind need not concern itself with the physical constitution of the plants and roots. It recognises their powers and virtues intuitively thanks to the signatures they carry".

This is probably best explained with a few examples.

Let us look at Heartsease or Wild Pansy, **Viola tricolor**. The lower leaves are heart shaped, and so the Doctrine stated that this plant should be good for the heart. In fact it is a heart tonic, and has been used in cases of heart failure. Incidentally, there is new and exciting data that shows that certain constituents of this plant have UV absorbing properties.

Self Heal or **Prunella vulgaris**, the corolla is shaped like a bill hook. It is also known as Carpenters' herb. This plant should be good for wounds caused by scythes or similar implements. It is in fact a vulnerary (or wound healer) and helps stop bleeding.

Celandine or **Chelidonium majus** has a bright yellow juice and so should be good for biliary conditions and jaundice. It is an antispasmodic, it reduces inflammation of the biliary ducts and has been used successfully for the treatment of jaundice.

Walnut or **Juglia regia** looks like a brain and so should be good for headaches or mental disturbances. It isn't!

Strawberry or **Fragaria vesca** has heart shaped leaves and so should be good for the heart. It isn't!

Eyebright or **Euphrasia officinale** has spots on the flowers that look like blood-shot eyes. It is, in reality, a superb plant for conjunctivitis, sore and inflamed eyes and makes an excellent eye wash.

Willow or **Salix alba** grows in damp places, because of this it was assigned under the Doctrine to be valuable for conditions caused by the damp, for example rheumatism. The willow bark was prescribed and worked. Modern technology investigating the reasons for the success found a glucoside called salicin from which salicylic acid or aspirin was derived. Other plants which have also been helpful in rheumatism have also been found to contain salicin (for example wintergreen, birch bark and members of the **spiraea** group)

The theory does not work all the time, but still has some merit, that I for one, am examining in some detail.

Well it wasn't too long before the Great Plague of London was to come along, and I am afraid to say, that the herbalists didn't do too well. The cause was unknown, but the effect was all too well understood. We all know the nursery rhyme:-

"Ring a ring a roses"

The first physical signs of plague were shown by the appearance of rose like rings of ulcerated skin.

"A pocket full of poses"

The floral get well message.

"Atishoo, atishoo"

The final stages of plague, which was congestion and flu' like symptoms.

"All fall down"

Which was death.

The very fact that we all know this childhood rhyme, is testament to the way in which information has been passed down from generation to generation.

Talking of the plague leads to a rather nice anecdote. It should be remembered that most of the major cities that had developed and grown faster than their antiquated (or in some cases non-existent) sewage systems had rat associated pestilence problems.

There were four thieves operating in the city of Toulouse (or Marseilles depending on which account you read). They had established quite a profitable little business which relied on the plague providing them with additional customs. As the plague claimed another victim for burial, so these ghouls would enter their homes and loot them.... and so the situation continued until the law caught up with them, found them guilty and sentenced them all to death.

No doubt the men had prepared to meet their maker, when the authorities had a sudden change of heart. The reason for this was quite obvious, they needed to know how these men had managed not only to survive the plague, but has actually courted danger in the very heart of it with apparent impunity.

Their recipe for their success, which has survived through to today, contained thyme, garlic, sage, lavender, rosemary and rue. It was the revelation of this formula that gave the men not only a reprieve from their death sentence, but also their pardons and freedom. Though all these materials are undoubted antiseptics and sterilants, I believe that these four rascals were lucky on many counts.

Such an event is often used as an argument against the success of herbalism, and yet, even when modern man knows the cause of disease, he is often unable to react quickly enough to prevent it from proliferating. We still have cholera epidemics today.

We have all come across one Old Wives' Tale or another in our time. The one that immediately comes to mind is.....

"Eat up your carrots, or you won't be able to see in the dark!"

I wonder how many of us had the frighteners put on us by our Mothers, in order that we might be coerced into eating the over generous portion of **Daucus carrota**.

Did they honestly think that we would be taken in by such archaic twaddle? If it was so jolly good,

why did Granny wear glasses? Answer me that!

And yet, it is absolutely true. Granny might have been wearing glasses to compensate for her weakened powers of focus, but in the dark she could have run rings around me. He who could hide a whole carrot under his knife and fork.

Her retina, with the benefit of the Vitamin A present in carrots, produced more visual purple. More visual purple and she had improved her night vision.

That is a proven scientific fact.

I have no doubt that she would have told my Mother that plastering her face in mashed up carrots would help her to keep her skin soft and free of blemishes.

As messy and unappealing as it must have been, countless generations did exactly that.

Again the benefit has proven scientific fact, and I have collected many reams of documentary proof.

I have studied in some length the benefits of Roman Chamomile and German Chamomile. It is well known that the **Anthemis nobilis** contains a very rich source of azulene and the **Matricaria recutita** a very rich source of bisabolol. It comes as no surprise to learn that both these materials have received considerable attention and been shown scientifically to have excellent skin healing effects.

The healing effect of comfrey **Symphitum officinale** has been known for generations, in fact since the time of the Crusaders. Apart from the bone setting qualities, it is also extremely good for helping the skin to heal. Again, analysis has shown that the herb contains one of the highest contents of any plant of allantoin and vitamin B12. Both of these materials have been clinically studied and proven to have beneficial skin effects.

The benefits of allantoin were discovered from the most unlikely of sources, and I hope you will be able to hang on to your lunches while I tell you why!

During the first World War it was noticed that the soldiers that went into the field hospital for the treatment of their wounds were more likely to contract gangrene than those that did not. They often suffered the unpleasant effect of flies laying eggs in the open wound, and then had the subsequent infestation of maggots. The maggots not only fed on the necrotic and putrifying tissue, but excreted as they went a solution that contained as a constituent, allantoin. Those wounds tended to heal better than those treated medically.

Subsequent studies on allantoin have proved it to be a powerful healing agent, which in turn backs up the use of comfrey as a healing agent.

Everyone knows that **Urtica urens** can give a nasty and irritating sting, this is due to the very small barbs that the leaves and stems have as a covering. The stinging nettle really is an evil little beast, and those barbs contain acetylcholine, a known skin irritant. I feel confident that if I asked anyone here this afternoon, what was the cure for this rash, that most would say, look for a Dock Leaf. Right answer!

The Dock leaf is a sorrel, specifically **Rumex obtusifolius**, and it is indicated (as with others of the sorrel family) for skin complaints, skin infections, skin irritation, eczema, acne, boils and swellings. So with a nettle rash, it is not a bad choice under the circumstances.

An Old Wives' Tale or a scientific fact, I put it to you that this is a proven scientific fact. We all know it works, and so do all of the references. Now try buying it from the local Chemist!

Which now leads me on to another extract, this time a seed oil.

Evening Primrose, not related in anyway to the Primrose or Cowslip of the *Primula* species, but **Oenothera biennis**, a plant introduced and naturalised in this country in the 17th. century, and which can be found growing wild by the roadside and in seaside areas. In fact it enjoys such rugged conditions that it has been planted on the sites of old gravel quarries as a cash crop.

This is a real success story, and shows how modern technology can prove something that everybody knew in the first place.

The consumer had been consuming the oil in capsules and applying it in creams for a number of years. It had developed quite a cult following, of people who liked the effects of this pretty flower and the oil that its seeds contained.

Now Evening Primrose had always been recognised for a number of benefits, and in the 70's it was recognised that one of the ingredients was GLA (gamma linolenic acid), I don't want to go into all the chemistry, so let's just say that it is a biologically very interesting material, that plays a part in the synthesis of prostaglandins.

It was thought that GLA had a very special effect on the skin, especially in cases of eczema and atopic dermatitis. It was only when they came to look for natural sources of GLA that they discovered that Evening Primrose seed oil contained one of the highest levels. Had they looked a little further they would have discovered that there are a number of plants which have even higher levels, such as Borage and Comfrey.

Anyway, to cut a long though fascinating story short, they tested Evening Primrose Oil in a clinical trial and discovered that indeed, the oil was good for cases of eczema. The product now has a Product License number, and is available by prescription. Incidentally it is also licensed for mastitis and atopic dermatitis. 500mg. will also help with a hangover, and daily might help certain cases of PMT (Premenstrual Tension).

But there are other discoveries in the pipe line.

There is a plant in ayurvedic medicine called Neem or Nimba, which is also known as Margosa or **Azadirachta indica**. This plant has been used in India since earliest times as a skin antiseptic. I have been collating the use of plants as antiseptics for some time.

It was, therefore, a very pleasant surprise, when I received some literature from a company, saying that they had discovered a preservative derived from a natural plant oil. Furthermore, that it would satisfy the British Pharmacopoeia challenge test criteria at levels that would not be unreasonable.

On further examination, it turns out that this preservative is none other than Nimba. Now this turns out to be a two edged bonus, not only would it be a new preservative, but it would also be a skin anti-inflammatory.

And there we learn yet another lesson from nature. The active ingredients that achieve a desired effect, often give serious side effects, when used alone. These might be irritation, allergy or skin sensitisation. It is so often the case, in the study of natural materials, that one discovers that nature includes an antidote or desensitiser within the mixture.

Don't get me wrong, I can give you countless examples of cases where nature includes phototoxic materials or irritants, such as bergapten in bergamot oil. Though having said that, I have recently been reading that trace amounts of 5-MOP can be beneficial in treating psoriasis without any risk of phototoxicity.

At the introduction to this talk, I mentioned that plants and medicinal extracts have similar properties attributed to them regardless of their geography or culture. Let us consider Fenugreek or **Trigonella foenum-graeceum**, which is also known as Greek Hayseed.

Generally speaking it is a healing agent, a weak aphrodisiac, a carminative and it also increases lactation in nursing mothers.

Now I'm not saying that all of the references claim all of these properties, indeed, most of them have a number of other uses as well. However, in the most part there is tremendous correlation.

In India it is known as Methi and in Sanskrit as Methika and it is considered carminative, aphrodisiac and healing. It is also considered to be good for hair loss.

In Java it is reported for use in hair tonics and to cure baldness.

In England (where it was introduced in the 16th century) it is known as Bird's Foot and Classical Greek Clover and is thought to be healing, carminative and lactative.

In Ireland it is used as an healing agent.

In Egypt it is known as Helba and throughout the Middle East it is believed to be carminative and healing.

In Europe (where it was introduced in the 9th. century) it is used as an aphrodisiac and healing agent.

In the Mediterranean (where it is a native plant) it is commonly known as Greek Hayseed and is used as a carminative and healing agent. It is also used in the synthesis of sex hormone preparations.

In China (where it was introduced in the 10th century) it is used for impotence and other male problems

In America,.... well I am sorry to say that our friends have let us down badly here - they use

fenugreek for flavouring imitation maple syrup!

But I hope you would agree that this is a very interesting piece of substantiation. It shows that it does not matter whether the plant was native to the area or whether the plant had been imported and established. The success of the plant must have been tried, tested and proven, or else the claims would not exist today.

I have stood here for 40 minutes to try and convince you all that the future must go forward naturally. There are some wonderful plants and materials that I have not had time to tell you about.

I know that there are many thousands of plants that have never been fully documented, and the people that know their secrets are either taking those secrets to the grave, or leaving their villages in order to follow western culture.

Anthropologists, Herbalists, Homoeopaths, Aromatherapists, Archaeologists, Pharmacognacists and Botanists, to name but a few, help to keep the natural world alive.

The tremendous increase in sales of herbals, plant books and books on natural cosmetics and alternative medicine, proves that the interest in naturals is there.

People like Dr. Malcom Stuart, Curator of the Cambridge Physic Garden is attempting, with similar minded people, to preserve the genetic stock of our medicinal plants. This facility has opened this year. He has also set up a team of consultants to further the aims of herbs and medicinal plants.

There are a number of ways in which my industry, can help preserve the future, and at the same time preserve a small part of the environment.

Firstly, insist on plant extracts of a medicinal quality.

Secondly, use levels of extract that will be of benefit to the skin, and not only to the pack copy.

Thirdly, seek out new extracts and so encourage exploration.

Through the simple economics of demand we can create supply. It is supply that creates profit, and I make no apologies for using the word profit. It is the profit that generates investment, which funds the research from which comes knowledge.

If my customer discovers that his faith in my product is nothing more than another advertising bandwagon, then there is no natural future.

I personally hope that there are a few more success stories like evening primrose oil to encourage more investigation into plant material.

Exciting developments in the process of evaluation include a postoperative treatment for mastectomy patients, where the need is for antipruritic, cicatrisation and peripheral blood flow increases.

We have a clinical trial at Great Ormond Street Hospital for Sick Children to evaluate natural preparations for eczema and dermatitis, where we are looking at a comparison with another study using Chinese plants.

A product aimed at treating veterinary mastitis.

A burn treatment gel designed to be antipruritic, moisturising and semi-occlusive, yet having a slow release of natural healing agents.

A lymphoedema product aimed at reducing cellular damage caused by failure of the lymph drainage system, to restore that drainage, break down fatty tissues and restore proper blood flow to the site.

You may have thought that I was going to talk about moisturisers, cleansers and night creams, lipsticks, rouge and eyeshadow. In a diverse way I have, if I know something has a medicinal effect, then I know that I can use those benefits in my beauty products.

I started my lecture with a bouquet from the language of flowers, and so I would finish in the same way but this time with a simple tribute of Wormwood and Blue Flax.

Wormwood, which stands for sorrowful parting - Even the best of friends must say farewell, and Blue Flax which says that I am touched by your kindness.

Mr Chairman, Ladies and Gentlemen, thank you for listening to me this afternoon.