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PRODUCT INNOVATION

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Madam Chairman, Ladies, Gentlemen and fellow Scientists.

INTRODUCTION

I am again very honoured to be speaking to such a learnéd assembly and I hope that I can be innovative when I speak for a fifth time at Conference.

But before I start, what exactly is meant by innovative?

DEFINITION

To innovate is defined as: Bring in novelties; make changes in.

THE RULES OF INTERPRETATION

Innovation can mean different things to different people. Let me give you an example.

Just suppose that we were going to develope a box.

The Customer sees a construction that looks like this...

AN ELABORATE RIBBONS AND BOWS CONSTRUCTION

The Supplier has a vision that looks like this....

ANOTHER ELABORATE CONSTRUCTION BUT TOTALLY DIFFERENT IN COLOUR AND DESIGN

The Packaging Technologist visualises.....

A SOLID REINFORCED TOTALLY SECURE AMMUNITION BOX

The Production Manager sees the design as.....

A STOUT CARDBOARD CUBE WITH NO DECORATION

Whereas the Accountant has a very novel view....

A PAPER BAG WITH A BOW ON IT

Yes, under the circumstances it is certainly reassuring to see the whole team moving forward as one body, sharing the same vision of the final product and hopeful of achieving a successful launch.

Our first rule, therefore, is to have a common goal, and this requires communication.

The second rule is to listen.

I am not interested in excuses, and I don't really care if you, as a supplier, think my idea to be a good one or not. My customer certainly doesn't give a fig what I think of his brightest concept. What he wants he must surely have, and I still believe in the old adage that the customer is always right.

The third rule is to try. Have a go, humour the customer, commit some resource, and maybe at the same time develop an expertise and market niche in the process.

The fourth rule is to be selective.

There is so much happening in the world of raw materials, that I realised some years ago, that it was impossible to see every single company representative that visited our company. We therefore have divided up innovation into several groups which have wide overlaps. My area is natural materials and their derivatives, and I have two chemists who overlap certain elements of this important area.

So having defined some simple rules for innovation, we must look at the forms that innovation might take. I will make it quite clear from the outset that I am not going to reveal my innermost secrets to this conference, but as David Frost might say "The clues are there!".

Now it might be said that some are born innovators, some achieve innovation and others have innovation thrust upon them.

BORN INNOVATORS

Let me take those three headings as a starting point. A born innovator is someone who looks at the existing technology, not necessarily in his own field, and adapts it to his own set of requirement criteria. In my opinion this is one of the hardest types of innovation possible.

Re-examination of raw materials.

Examples of this include the re-examination of classic raw materials.

For instance, we might have been using chamomile oil in our lotion for its healing and soothing properties, re-examination of the oil shows it to have a blue tint. Well it is blue if you are buying a good grade! Deeper questioning demands that one discovers what causes the blue colouration. It is azulene of course.

So what does azulene do? One consults the literature and finds that it is one of the healing components of chamomile, which also has anti-inflammatory and antiphlogistic action.

Innovation strikes! We will fortify the chamomile oil with azulene from the same natural source. Naturally, there is a price to pay - the extra healing lotion that we have created is now a delicate shade of blue. The F,D&C Blue No.1 which was originally contained in the product as colourant, now has to be removed, otherwise the product is excessively blue. I know I am only allowed to use colours permitted by law, and it is a really unfortunate event that my healing agent happens to be the same colour as my original product.

This has occured to me on many occasions, it happened when my product went a shade of pink with sandalwood, which I had put in there for its skin softening and soothing effect. It went lemon yellow when I used Golden seal for its skin cleansing properties. Indeed, indeed it seems to be happening all the time, and our synthetic colour usage is in a constant state of decline.

Other ingredients that we have been using for their various skin effects have other properties. Heartsease is used for its anti-inflammatory properties, and I regret that it also has some UV screening properties. It is not, of course, a permitted sunscreen and so I cannot incorporate it into my product for that purpose, however, the stability of those fading colour side-effects seems to have improved as the products benefits have increased.

Finally, we have been looking at making a number of our products slightly medicated, by the addition of some natural antiseptic oils. I know that I am not legally allowed to use any preservative that it is not listed or provisionally listed in the regulations, but my preservative loading does seem to have decreased as the natural antiseptic qualities of my products have increased.

ACHIEVED INNOVATION

The second category I mentioned was achieving innovation, which is definitely the hardest type, since it involves identifying a product need and then finding the raw materials that fulfill the requirements.

Natural perfume

For example natural perfumes. Ten years ago, in desperation we had to blend our own essential oils in order to produce a natural perfume. The perfumers said that it was too expensive, the blended oil would be unstable, the fragrance would not be sufficiently sophisticated, it would never sell, and so on and so forth. A classic example of we know best and must save you from yourself. The perfume houses on this occasion were hopelessly wrong, the market it seems can withstand both the cost and the unsophistication.

Natural Preservatives

Another area is in the field of natural preservation. We know that various plant oils and extracts exhibit antibacterial activity. There is already a grapefruit seed extract on the market which has some encouraging results as a preservative. The use of **Mimosa tenuiflora** has also had some success. The preservative para-hydroxy cinnamic acid has been isolated from Aloe vera is also quite interesting. However, there are many plant oils, such as thyme, marjoram, margosa and tea tree oil, which contain active principles that give preservative action, which have not been

isolated.

It would probably come as no surprise if I told you that there are at least two plant species that contain substantial levels of benzoic acid and others which contain benzyl alcohol (legally permitted preservatives). Why no one seems to have isolated these natural materials, is a bit of a mystery. I can only think it is a question of cost, since the initial offers have been dear.

We know that certain chelating agents can enhance preservative action, there are materials available from nature, which can replace the EDTA most of us use today. It is reasonably priced.

Ethnobotany

I may just have mentioned a few times over the years that much of my spare time is spent building a natural data base. I am currently studying the Ethnobotany of the Waimiri-Atroari tribe of the Brazilian rain forest, the ethnobotany of equatorial Africa and am deeply engrossed in Chinese Herbal medicine, Japanese medicinal plants and for good measure am looking at the herbalology of the North American Indians.

A most exciting acquisition has been the manuscript of William Gardener, a Britain who spent much of his life in China, and then devoted many of his later years translating a large number of the Chinese texts relating to indigenous species. Regretably William died a few years ago, but I am hoping to complete his ambition and publish his work early next year.

From all these studies, one finds that many of the plant materials have extraordinary claims for their benefits. It is technically and commercially right that we should obtain samples of these plants and make use of these properties.

Now try and convince someone that they are worthy of extraction. What an uphill struggle! You ask suppliers to obtain the material. The excuses begin to flow, you plead for a sample, often phoning up a dozen or more contacts, until eventually a sample is prepared. Within six months of launch, you find that the world and his mate are knocking at your door trying to sell the very extract that was never going to be obtainable. No, the "Let's wait and see Brigade" do not have my loyalty.

There are some 650,000 species of plant in the world, plenty enough to go around, and I could not let the moment pass without singing the praises of people like Dr. Alan Onions, who has done more than any other extract supplier to bring choice and variety to the industry, through the introduction of South American rainforest and Chinese medicinal plant materials. No "me-too" in amongst this lot. Nor, I hasten to add, are **all** the suppliers resting on their laurels, Mr. Lawson and Mr. Connock also have some new materials to offer, which look very interesting.

Given the availability of a plant, one can commit time and effort to researching its benefits. Even then, there is no guarantee that our marketing colleagues are going to like the name of Bloodroot, Butcher's Broom, Chickweed, or Bog Myrtle.

I don't particulary like the name Cabernet Sauvignon, but it does not stop it from being a very fine wine, nor to the point, does it stop me from drinking it. Thankfully, the plant name is beginning to take second place to the plant benefit.

So please do not come to me with the vin ordinaire, I will not be receptive. Set me the challenge of discovering the benefits of a remote Oriental or South American extract, and I shall be thrilled and committed.

Data base searches

Another area that I am working on involves the extensive use of the data base to select those materials that have very specific effects and combine them into a product range targeted at a specific treatment.

This is not only aimed at the every day cosmetic customer, and recently we have been looking at a range of products for those people who have undergone surgical intervention for a particularly distressing condition. This is a project in which I have a keen, almost humanitarian involvement.

There are three stages involved in the healing of this wound, which takes about two years to complete.

Firstly, there may have been radiation therapy, which causes extensive tissue damage and bruising. Our first product had to minimise the radiation damage, reduce swelling and be antiphlogistic. It also had to be anodyne, that is, it had to lessen pain at the operative site.

Secondly, there was a need to remove necrotic tissue, encourage increased skin cell proliferation and give an even granulation of the epithelium, without the formation of cheloids or lumpy scar tissue. This stage is often accompanied by intense itching and discomfort, which had to tackled with antipuritic materials.

Thirdly, there are those cases where the scar healing process has not been even, and the site needs intensive treatment to lessen the unsightly effects that have occured a year or more after the original operation. This is often accompanied by problems of poor skin colour, poor circulation and signs of lymphodoema. We therefore looked at materials that improved peripheral capillary blood circulation, materials that were effective cicatrising agents and materials that would encourage skin cell proliferation.

These products are not intended to replace the initial medication, they are intended to take over where the medical products finish. The site at the initial stage is healed, but it will be far from cosmetic. These products are designed to slowly maintain and improve the skin site.

I am often asked what are the effective level of extracts needed produce a result, I can confidently tell you that from our researches we believe the level to be in the region of 15-25% (which equates to 6-12% of fresh plant material). These three products contain in total, some 12-15 different herbal materials. I regret that the products are not at a stage where I can disclose their composition. However, I can tell you that the studies carried out in a number of teaching hospitals (involving some 650 samples) have been exceedingly encouraging, surpassing even my expectations.

Great Ormond Street

You are probably aware that the Great Ormond Street Hospital for Sick Children is engaged in a project to evaluate Chinese Herbal medicines, and are evaluating the beneficial effects of botanical or herbal products on wet and dry eczema conditions. We are involved indirectly in this work and have developed a range of suitable treatments based on European medicinal plants.

This is truly a source of innovation and this work will give results that can then be translated back into our skin care ranges. Also, these results will also enable me to validate some of the data that has been put into the computer.

INNOVATION THRUST UPON US

Then there is innovation that is forced upon us, again I will draw from the natural realm for my examples.

Anti-cellulite

I have seen extensive and excellent work done in the area of anti-cellulitis. We have been looking at lymphodoema, which is a closely related problem and involves the inadequate function of lymph drainage. This leads to congestion, accompanied by fatty deposits and water retention in the tissue, and results in the formation of nodes and irregularities in skin profile.

A number of solutions have been suggested by raw material suppliers, all of which have been entirely credible, but in particular there were three which came with clinical trial data to back up the claims.

One was a blend of **Ruscus aculeatus** (Butcher's Broom), **Paullinia cupana** (Guarana) and a **Citrus species** (Lemon), another was a naturally modified marine derivative on a silicon back bone, and another a blend of **Hedera helix** (Ivy) and **Fucus spp** (Seaweed extracts).

The question was, whether to stick with these suggestions or whether to build further on their technology? We decided that the delivered product did not go quite far enough. The need to soften up those fatty deposits during treatment seemed crucial, if we were to see rapid results, and so we considered the inclusion of certain fruit enzymes to be essential. The need to address the lymphatic circulation was of course the driving force of the product, but would the incorporation of a powerful botanical specific to improving the peripheral blood circulation also be of benefit? We felt that it would.

There is some good news and some bad news.

The good news is, that we have some early indications from various dermatologists, that the results are an improvement on the original trials conducted by the raw material supplier.

The bad news is that the product contains around 20% of active plant material and as a result the product falls outside the cost guidelines set for this product.

In real terms I have failed on this project, since I have not delivered to the terms of the brief. The next stage of innovation is to make it cost effective by evaluating alternative raw materials.

SEEKING INNOVATION

Seeking innovation is the fourth source of innovation, this is the innovation that comes when you borrow from somebody else's technology. In our own field this might be called lateral thinking, though I would prefer to think of it as learning something new or seeing technology from a different angle.

Aromatherapy

Delving deep into the precepts of Aromatherapy, one finds that certain oils are believed to have specific psychological action. For example Lavender is believed to be calming, Jasmine produces a state of increased awareness, and Chamomile produces a calming effect.

These oils have now been proven to penetrate into the blood stream and have an effect on the CNS or central nervous system. The oils that were said to be sedative, like lavender, do have sedative effects when the brain wave pattern is studied. Likewise Jasmine has an uplifting effect and heightens responses to stimulae. Chamomile was proved to increase a more positive and optimistic attitude.

The day when a foam bath can be truly relaxing or stimulating from a psychosomatic point of view has at last arrived. What surprises me is that the perfume houses have been so slow to pick up on this, perhaps they were too busy looking at psychological profiles, rather than the physiological effects.... However, to be fair, I do know that Quest have been active in this area.

Herbal medicines

Herbal medicine has always been a source of my inspiration, but these days I am looking very deeply at specific botanical materials that have been examined for their chemical constituents to treat very specific conditions, for example cancer, diabetes, herpes, etc. Though I am fascinated by this field, it is not my specific area. The reason to keep abreast of developments in these fields is to look for the unexpected side effects.

For example, talking to a botanical drug research company, we heard of a botanical extract sent over from Africa that was a week late in arriving for the clinical trial. It had been standing around in a warm hotel room in all that time. Yet, when the sample eventually arrived at the clinic, it was found to be virtually sterile. Normally, locally extracted plant material is microbiologically dirty, full of spore bearers and other undesirables. This material seemed to shun contamination. Have we found a natural preservative? I will have to let you let you know!

Recently, I had a visit from a Fellow of the Pharmaceutical Society, who had read some of my papers, and decided to pop in for a chat. We were discussing natural antiseptics, when he suddenly became very excited and said that he knew of a plant used in one of the Africa countries as a mouthwash ingredient. It also happened to turn the product a deep red. Nothing extraordinary about that I hear you say, however, if you had been working in the field of natural colours, you would know that natural reds, usually from the xanthocyanins are notoriously unstable and fade very quickly. Studies done on this material by that country's leading University, showed it to be acid and light stable. What a bonus - an antiseptic and a stable red dye - I can hardly wait for my sample!

Traditional textiles

I have almost given up trying to encourage the food colour producers to make natural dyes for me. So there I was, in the depths of despair, when I overheard someone at the Wimbourne St. Giles open day saying that they dyed and spun their own yarn, which they subsequently weaved into cloth using a traditional loom. She was a member of the Sarum Spinners Guild.

Being nosey, I asked how she obtained her dyes. It turned out that she bought them as dried plant material from a wholesaler, who imported them from around the world. She boiled these materials up to obtain the dyes, and used various mordants to achieve the yarn colour that she wanted. She also grew various traditional plants for her own use, where they were not commercially available.

Needless to say it is a lead that was followed up, and we are now up to our necks in various seeds, roots and barks from around the world. Kew Gardens have been extremely helpful in supplying missing data, as has a friend of mine who is the Curator of a Physic Garden and holder of many old European texts.

Another contact, an agronomist, is prepared to grow an experimental crop, should the trials prove successful, in order to harvest the appropriate parts, that can then be sent to a commercial extractor for evaluation and processing.

The commercial extractor needs to know the approximate yields, the toxicity and the demand for the finished producut. An analyst needs to analyse the plant in order to determine the chemical responsible for the colour.

Collaboration

So, I hope you can see that innovation may involve the drawing together of groups, each having the skills that the other lacks. If seeking innovation by lateral technology was difficult, then achieving collaboration between groups is, sadly, almost impossible.

In our own field. The Aromatherapist has the knowledge of massage and the effect of an essential oil on the body, the herbalist recognises the importance of the whole patient and seeks the cause as well as the cure, whilst recognising the plants that will give that cure, the pharmacognocist understands the chemical composition of the plant and the best means to extract it, the ethnobotanist knows the source of the plant and how the plant is used locally, the taxonomist can ensure that the plant mentioned in the text is the plant that is submitted for extraction. The pharmacologist recognises the need to obtain the maximum quantity of the drug from the plant. Chinese herbalists, homoeopathists, phytotherapists, dietitians, cosmetologists, dermatologists and a myriad of other related professions fit into this picture, each with a different perspective and each equally important to the discussion.

Let me give you another example, last year Dr. Linda Fellows gave a lecture in the SCS Autumn Symposium and I went to hear her lecture again at the British Herbal Medicines Association in order to hear the unabridged version. On both occasions the message was clear - from Archaeological evidence, we are now eating only 10% of the plant foods that we were eating as primitive man. Many of those foods contained trace toxins. Is our diet lacking these materials,

does the body's largest organ, namely the skin, require these trace elements? Can we apply them topically, or do they have to be ingested?

Is the rise in the number of dermatological skin conditions and the rise in the number of cases of asthma (a closely related symptom) down to the external effects of modern chemicals, pollution or the fact that trace elements are missing from our make up? Are we applying a modern condition to an older diagnosis? (i.e. "Oh, he's always been a wheezing and chesty baby", may now be "He's got to have one of them inhalers for his asthma")

In homoeopathy, many treatments are based on the use of trace toxins. Is there a new view of dermatological science to be taken, for example, though we know that the furocoumarin called bergapten (or 5-methoxypsoralen [5-MOP]) in bergamot oil is phototoxic, there is a building body of data to show that in **trace** quantities it is very beneficial, having valid use for the treatment of psoriasis.

How many other materials in small doses would be good for us, such as alkaloids, steroidal saponins, terpenoid saponins, sesquiterpenes, esters and the millions of other chemical entities found in botanical species.

The scenario is so complex, that no one professional body could answer all the questions. We need more collaboration, our own NASA team if you like.

You have to work at innovation.

NECESSITY IS THE MOTHER OF INVENTION

It has been said that necessity is the mother of invention. I often feel that this necessity produces many nonsenses.

THE INNOVATIVE USE OF WORDS

But before I close, let us look at some of the truly innovative ideas that have been thrust upon us by our Marketing colleagues.

There are many that involve the innovative use of English, such as "this smooth gel contains organic microspheres to gently cleanse your delicate skin of impurities". This is not innovative. These are polyethylene beads in a gel to scrape and scratch off your dead skin cells and hopefully remove some of the make up that was not properly removed and which has now become ingrained into the skin. Neither the polyethylene grains nor the gel is innovative, both have been around for years.

However, the use of luffah particles or suspended dessicated cocnut might have been considered more innovative.

The other type of verbage involves making fantastic claims that don't mean anything to anyone. In other words it fills up the space on the leaflet or pack without running the slightest risk of the Trading Standards Officer or anyone else being able to challenge you in court.

Typical examples:

"Restores the skin to a more youthful vigour".
"Protects the skin against the harmful effects of the environment"
"Air-conditioning for the skin"

And have you noticed how everything must have an SPF factor these days?

If we carry on in this way, it is only a matter of time before we start to notice an increasing allergy rate to the so-called "chemical sunscreens", because of the excessive and needless exposure to these materials.

I am just waiting for the appearance of an SPF 15 Night Cream!

In the words of the Marketing men, all this gobbledygook is a load of testicular macrospheres.

INNOVATIVE CAUSES

I know that I was supposed to talk on innovative materials, but there is one innovative cause which has really had its day. Who was the bright spark that dreamed up the phrase "not tested on animals". And before you come and blow my car up on its driveway - Peter Black and I don't!

What a joke this is proving to be. Look how our colleagues have dug us a hole and slowly buried us in it. It all started off with
"not tested on animals", then it was

"our finished product has not been tested on animals", then it was

"our finished product has not been tested on animals and uses raw materials tested before such and such a date". This then became...

"our finished product has not been tested on animals and uses raw materials that were tested before such and such a date, but may have been subsequently tested by the food or pharmaceutical industry.

Of course, there is still the demand for ecological testing, but neither the media, nor those obsessed with this type of claim have realised that fish are sacrificed in this test.

The most ridiculous fashion now, is to either change supplier, to buy through an agent or even to change the raw material name, in order to avoid any mention of testing dates.

So here is my last innovative money making idea.

How much would you pay not to have sodium lauryl ether sulphate, talc and water animal tested, and the results published in the Sun newspaper?

Mr. Chairman, Ladies and Gentlemen, thank you for listening. I will gladly take any questions that you might have, and no doubt I will still be able to correspond from my cell in Parkhurst Prison, following the charge of extortion.