Perfume Formulation

THE LAVENDER-FOUGERE-CHYPRE GROUP

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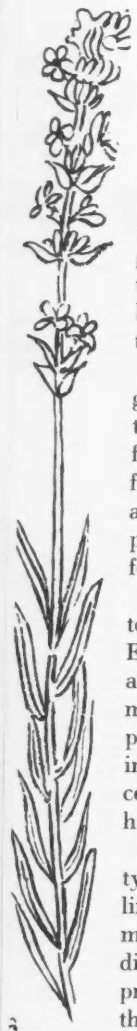

Lavender, fougere and chypre are classified together because of their interlocking fragrance relationship. No clear line of demarcation can be drawn between them. For convenience they will be referred to as the LFC group.

Theoretically, lavender is the "parent" of this group. By suitably modifying a lavender composition with bergamot and traces of oak moss, it is transformed into fougere. Then, by further modifying this fougere with heavy notes (vetyvert, sandalwood, etc.) and sweet powdery components (vanillin, heliotropine, coumarin, the artificial musks) it may be transformed into a chypre type.

Although this consecutive transformation appears to be simple, in actual practice it is quite complex. Each member of this LFC group can be subjected to almost unlimited variations within themselves, which makes for an almost infinite number of fragrance possibilities within the group. It is also of the greatest importance to the perfumer, since a very high percentage of the commercially successful fragrances have their origin in it.

In the subsequent discussion only the fundamental type formulas can be touched upon because of spatial limitations. The endless variations and elaborations must be developed by the artistic talent of the individual. Since *any* of the floral groups discussed in previous articles can be used to modify *any* of the three subdivisions of the LFC group, a tremendous range of artistic expression is available.

Rose, jasmin and lilac are the conventional florals used for modification in the LFC group, but the perfumer should not limit himself to them. The best advice for working in this LFC group is to experiment freely without prejudice or preconceived ideas.

LAVENDER

The lavender fragrance has a clear, refreshing, spicy-herby-camphoraceous effect. It resembles clover and new mown hay, and is used in the design of these compositions for that reason.

Four essential oils with a lavender fragrance are lavender absolute, lavender oil, lavendin oil, and lavender spike (aspic) oil.

Lavender absolute is a dark green, viscous oil, made by solvent extraction of selected lavender herbs. It possesses an exquisite lavender fragrance, sweet and fresh and more flowery than any of the other lavender products. The absolute is the most costly of the lavender materials and is used for the finest perfume effects.

Next in order of artistic importance is lavender oil, which constitutes the greatest bulk of the production of lavender products. It is obtained from the herb by steam distillation. The quality varies according to the district of origin and the technique of distillation. The desirability of lavender oil is rated by its ester (linalyl acetate) content; thus lavender 40/42 would be considered a high-grade oil. It is widely used in all kinds of fragrances, particularly colognes and soaps.

Third in line is lavendin oil, an essential oil distilled by steam from a lesser species of lavender herb. It is usually cheaper than lavender oil, but does not have as fine an odor, since it is more grassy and coarse. It is used considerably as a cheaper version of lavender oil in such products as soaps and cheap colognes, where fineness is not needed and cost is important.

The last of the major lavender products is the spike oil, steam distilled from a still lower species of a lavender-like herb. It has a very coarse, somewhat minty odor, and is largely used for cheap soap work.

Lavender concrete, an intermediate in the production of lavender absolute, is also available. The natural waxes contained in it contribute valuable fixation; concrete is used with lavender products only, as a fixative. The use of concrete is limited by the insolubility of these same waxes in alcohol. Only moderate quantities can be used in extract and cologne work, as there is a decided tendency for the waxes to cloud out of the alcoholic solutions even after the conventional freezing procedure.

The lavender products, with the exception of the absolute, can be subjected to acetylation with acetic anhydride. This procedure increases the ester content by acetylating the linalool present. The resultant effect has found some favor. Usually, however, this acetylation operation is used on the lower qualities in order to try and upgrade them.

Lavender products are very easily adulterated, since each one may be adulterated by those below it in quality and price. Then, at any point, any of these products may be further "trimmed" with cheap linalyl (or shiu) acetate, or even with terpinyl acetate, which is the very rock bottom for cheapness.

Faced with this complex opportunity for adulteration, the perfumer is strongly advised to shun any price bargins in lavender products and do business only with essential houses of established repute. Lavender adulterations are not easy to detect in the oil used, but show up later as a depreciation of the final product.

The fragrance of the lavender herb in its natural state is not attractive like other flowers; it is peculiarly musty and camphoraceous. When the layman smells the herb for the first time he usually describes it as "medicinal" or "hay-like."

Therefore there is no objectve in striving to achieve a high degree of accuracy in a lavender fragrance, as is the case with other flowers. Instead, the perfumer builds a sweet, fancy floral effect around a substantial quantity of a lavender product. Often considerable citrus notes are added to lighten the odor and give a cologne-like touch. The various "lavender" fragrances appearing on the market are out-an-out fantasies with only nominal resemblance to the true native lavender herb.

The lavender fragrance plays a highly important part in the creation of fantasy-type men's colognes, lotions, soaps, shaving creams and accessories. And, of course, it finds an extensive but more subtle use in colognes and fantasies for women.

Unfortunately, at present, lavender is beginning to suffer the fate of lilac and pine as a "solo" fragrance. Cheap lavender-like effects based on terpinyl acetate and various distillation residues of nominal cost are readily made, and are finding wide and increasing use as industrial "masks." Thus, the public's appreciation of the fine lavender fragrance is being debased by these shabby imitations, just as was the case with lilac and pine.

Following are the purpose classifications of the various lavender components.

Basics. Lavender absolute, concrete oil, lavendin oil, lavender spike oil.

Blenders. Linalyl acetate, linalyl propionate, linalyl isobutyrate, "Lignyl" acetate (Shulton Fine Chemicals), "Nopyl" acetate (Dow Chemical), linalool, geraniol, geranyl acetate, citronellyl acetate, citronellol, dimethyl octanol, dimethyl octanyl acetate, benzyl dimethyl carbinol, phenylethyl alcohol, hydratropyl alcohol, terpinyl acetate and propionate.

Adjuvants. Alpha ionone, methyl ionone, dimethyl ionone, citral, cyclocitral, hydroxycitronellal—methyl anthranilate Schiff's base, bergamot oil, lemon oil, mandarin oil, orange oil (sweet and bitter), clary sage, melisse oil, petitgrain, oak moss, ylang Bourbon, peppermint oil, patchouli, styrax oil, vetyvert oil, vetyvert acetate, coumarin, melilotin.

To this partial list of adjuvants may be added such compositions as rose, carnation, sweet pea, heliotrope, amber, tobacco, rose otto, hyacinth.

Fixatives. Lavender concrete, benzyl isoeugenol, vanillin, musk tincture natural, benzyl salicylate, musk ambrette, musk ketone, musk xylol.

Naturals. Neroli, orange flower absolute. Rose and jasmin absolutes are exquisite to use but, since lavenders are rarely made in a price range sufficient to perimt their use, they are not common.

The following is a fancy lavender-type bouquet which may be varied in almost endless ways.

	LAVENDER BLOSSOMS E.047
10	Ylang Bourbon
10	Oil peppermint Hotchkiss
15	Oil petitgrain South American
15	Dimethyl hydroquinone
15	Coumarin
25	Geranyl acetate
25	Phenylethyl alcohol
25	Cinnamic alcohol
25	Ethyl decylate
25	"Tepyl" acetate
25	Musk xylol
25	Oil geranium African
25	Isobornyl propionate
50	Bois de rose Brazilian
50	Citronellol
50	Lavender absolute
75	Linalyl acetate
75	Oil bergamot natural
35	Oil lemon Italian
200	Oil lavender 40/42
200	Benzyl salicylate
1,000	

In this composition the basic lavender effect is created with 16 and 20. The blending is accomplished with 6, 14 and 17. Cologne notes are provided with 3, 18 and 19. One and 10 give a jasmin adjuvance. Seven, 12, 9 and 15 produce the rose adjuvance. Sweetness and fixation come from 4, 5, 8 and 11. Additional freshness comes from 2 and 13. Final fixation is made with 21.

"Lavender Blossoms E.047" can be used for soaps, lotions and colognes, and also serves as a useful specialty-type base in the preparation of fancy fragrances. By substantially increasing the bergamot content and adding a small quantity of oak moss, it may be shifted into the fougere class.

The following illustrates another lavender type, a composition simulating a famous lavender used for toilet waters.

	LAVENDER FOR TW E.048
300	Lavender 40/42
100	Lavendin
100	Lavender spike
100	French rosemary oil
50	Oil red thyme
40	Oak moss resin
100	Terpinyl acetate
50	Terpinyl propionate
70	Linalool ex bois de rose
40	Styrax resin
10	Labdanum resin
20	Oil patchouli
30	Musk ambrette
50	"Lignyl" acetate
5	Methyl ionone
10	Methyl coumarin
50	Oil bergamot

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10	Oil myrrhe distilled.
10	Tincture musk 4/128
5	Tincture ambergris 4/128
2	Ethyl vanillin
2	Oil estragon
3	Oil clary sage
3	Phenylacetaldehyde dimethyl acetal
40	Diethyl phthalate
1,200	

This E.048 composition differs from E.047 in that it is specifically a lavender fragrance for colognes and toilet waters. It is not suitable for use as a base, nor is it especially desirable for extracts and high-class work. It is not practical in cosmetics. Where a lavender fragrance *only* is requested, this is the type of composition that should be set up.

FOUGERE

Fougere is the French word meaning fern. There are many species of fern, with various shadings of fragrance. In general, the fougere fragrance is characterized by a substantial quantity of a light citrus note, with lavender and a touch of spiciness having an underlying woodiness. The combination of lavender with a considerable amount of bergamot and a bit of oak moss strikes the basic note of fougere. To this may be added a range of light compositions for floweriness. It is a peculiarity of the fougere class that the introduction of the heavy florals such as jasmin and tuberose tend to cause a veering towards the chypre class. With this limitation, a wide range of variation can be created within the framework of the fougere type.

Since the fougere components quite closely follow those of lavender, the usual listing of "use" classifications will be dispensed with. The following is a fougere type which illustrates the general design.

FOUGERE E.049	
35	Oil bergamot natural
15	Lavender 40/42
5	Oil lemon California
8	Ionone AB
8	Amyl salicylate
5	Oil vetyvert Bourbon
8	Oil geranium Bourbon
5	Oil patchouli
5	Citronellol
5	Ethyl salicylate
3	Oak moss resin
1	Oil carrot seed
2	Oil estragon French
1	Citronellyl oxyacetaldehyde
5	Oil sandalwood East Indian
8	Hydroxycitronellal
6	Linalyl acetate
125	

This type of composition is the foundation for many men's colognes and lotions. It can be varied extensively by manipulating it with lavender components, and by the use of floral bases and floral adjuvants.

New mown hay (also known as "Foin Coupe") is somewhat similar to fougere in regard to its liberal

use of bergamot and lavender, and many of the ingredients of both the lavender and fougere classifications. The most characteristic chemicals for new mown hay are coumarin and dimethyl hydroquinone. The following is an illustrative composition.

FOIN COUPE E.050

60	Lavender 40/42
80	Oil bergamot natural
10	Dimethyl hydroquinone
10	Ethyl salicylate
10	Oil ylang Bourbon
8	Oak moss resin
10	Linalool ex bois de rose
40	Hydroxycitronellal
5	Patchouli oil
20	Oil sandalwood East Indian
6	Vetyvert acetate
40	Coumarin
5	Oil clary sage
3	Alpha ionone
2	Methyl ionone
10	Amyl salicylate
3	Benzyl acetate
2	Amyl cinnamic aldehyde
4	"Tepyl" acetate
2	Vanillin
10	Oil geranium Bourbon
6	Musk ketone
5	Musk xylol
5	Aldehyde C-12 MNA 10% in DEP
2	Citronellyl oxyacetaldehyde
17	"Lignyl" acetate
375	

A few chemicals occasionally used as special adjuvants for the new mown hay compositions are: heliotropine, anisic aldehyde, acetophenone, benzophenone, cuminic aldehyde, cyclamen aldehyde, diphenyl methane, ditolyl methane, methyl naphthyl ketone, phenyl propyl aldehyde, paramethyl hydratropic aldehyde, methyl and ethyl benzoate, paramethoxy acetophenone ("Acetanisol"). The jonquil and narcissus effects in the form of compositions are interesting as floral specialty adjuvants.

CHYPRE

The name *chypre* is derived from the French name of the island of Cyprus in the Mediterranean Sea, where even today certain of the components of chypre are grown.

The chypre fragrance is an extension of the fougere, created by the addition of such heavy-odored items as vetyvert acetate, the artificial musks (xylol, ketone, ambrette), sandalwood, Patchouli, opoponax, coumarin and vanillin. Usually more oak moss is used in chypre compositions than in fougeres. For floralcy, jasmin, orange flower, neroli and extra heavy versions of lilac and rose are generally used, although almost any floral can be fitted in if it is made heavy enough. Throughout the chypre design, the accent is on heaviness and sweetness. From the layman's viewpoint, chypre would be described as an "oriental" version of the fougere.

Since the purpose classifications of the components of the highly important classification chypre group differ substantially from those of the lavender and fougere, they are shown below.

Basics. Vetyvert oil Bourbon or Java, vetyverol, vetyvert acetate, sandalwood East Iindian, santalol, santalyl acetate, patchouli natural and terpeneless, oak moss resin or absolute, oil bergamot.

Blenders. Terpinyl acetate and propionate, heliotropine, linalool, linalyl acetate, linalyl propionate, orris resin, oil of calamus, angelica root oil, clary sage oil, ambrette seed oil, celery oil, citronellol, citronellyl acetate, citronellyl propionate, di-N-amyl carbonate, phenylethyl alcohol, cinnamic alcohol, tolyl alcohol, hydratropyl alcohol, estragon oil, para-cresyl ethyl ether, oils of cedarwood and cypress, cedrol, cedrenol, para-cresyl caprylate.

Adjuvants. Coumarin, vanillin, dimethyl hydroquinone, diethyl hydroquinone, methyl ionone, ionone AB and alpha, ylang Bourbon, cananga oil natural and terpeneless, eugenol, isoeugenol, cinnamic aldehyde, alpha methyl cinnamic aldehyde, isosafrol, methyl salicylate, ethyl salicylate, isobutyl salicylate, amyl salicylate, hexyl salicylate, methyl cinnamate, ethyl cinnamate, isobutyl cinnamate, amyl cinnamate, cinnamyl acetate, cinnamyl propionate, cinnamyl isobutyrate, oil bergamot, oil orange (sweet and bitter), dimethyl ionone, oil mandarin (Italian), oil pimento, oil mace, oil nutmeg, oil coriander, oil black pepper, oil lemon, oil limes, rhodinol and its esters, citronellol and its esters, geraniol and its esters, amyl and isobutyl benzoates.

Fixatives. Resins of tolu, benzoin, labdanum, castoreum, styrax and cyste, benzyl isoeugenol, benzyl salicylate, phenylethyl cinnamate, phenylethyl phenylacetate, citronellyl phenylacetate, benzyl phenylacetate.

Naturals. Rose absolute, rose otto, neroli, orange flower, tuberose, jasmin, immortelle, mimosa, genet (broom), cassie absolute (occasionally used as a green nuance).

The various aliphatic aldehydes used in the chypre design should be employed discreetly. It is a peculiarity of the chypre that if aldehydes are used too liberally, it will begin to resemble the Chanel No. 5 type, particularly if jasmin compounds are used extensively in the make-up. Since the Chanel No. 5 fragrance is probably one of the most frequently imitated of the French perfumes, this tendency will minimize the originality of the chypre effects being designed.

The following is an illustration of the chypre fragrance.

CHYPRE ORIENTAL E.051

185	Oil bergamot natural
100	Oak moss resin
120	Coumarin
25	Vanillin
18	Musk ambrette
35	Musk ketone
4	Phenylacetic acid
8	Vetyvert Bourbon

8	Methyl ionone
7	Hydratropyl alcohol
45	Rhodinol
20	Castoreum absolute
18	Ylang Bourbon
4	Methyl salicylate
4	Rose otto
4	Oil estragon
8	Oil patchouli
5	Lavender 40/42
10	Petitgrain South American
3	Cinnamic aldehyde
6	Isoeugenol
15	Oil bitter orange
35	Oil lemon California
7	Aldehyde "Veronol" 10% in DEP
9	Aldehyde C-14 10% in DEP
8	Civettiane (Perfumery Associates)
15	Amyl cinnamic aldehyde
10	Benzyl propionate
15	Tolyl acetate
30	Hydroxycitronellal
10	Benzyl acetate
9	Diethyl phthalate
800	

The foregoing formula represents an elaborate chypre, and demonstrates an extensive use of the various components previously noted. It is a useful material as a specialty for the variation of other compositions. Shown below is a very elemental chypre base. This is not a finished effect. It is merely a "skeleton" that must be elaborated upon by the perfumer. It is the chypre effect in its simplest form, and should be floralized and sweetened.

	CHYPRE BASE E.052
40	Oil bergamot natural
40	Linalool
30	Sandalwood East Indian
10	Oil bitter orange
5	Oil lemon California
12	Ylang Bourbon
8	Methyl ionone
4	Ionone AB
15	Heliotropine
2	Ethyl vanillin
8	Oak moss resin
6	Musk xylol
2	Oil star anise
4	Coumarin
2	Civettiane
2	Oil clary sage
8	Benzyl propionate
6	Amyl cinnamic aldehyde
20	"Lignyl" acetate
1	Diethyl phthalate
225	

The preparation of a chypre effect presents several technical problems because of discoloration. The various resins, oak moss and labdanum in particular, are intensely colored and will therefore transmit their color to the soap. Vanillin and ethyl vanillin offer discoloration troubles because of their oxidative properties when standing in the presence of alkalies. Therefore a considerable compromise must be made in the design of a chypre for soap or bath salts. The following is such a formula.

	CHYPRE FOR SOAPS AND BATH SALTS E.053
10	Musk xylol
50	Coumarin
50	Petitgrain South American
10	Lavender 40/42

5	Oil labdanum distilled 10% in DEP
2	Cinnamic aldehyde
10	Isoeugenol
2	Hydratropyl acetate
2	Galbanum oil 10% in DEP
80	Oil bergamot natural
20	Citronellol
10	Phenylethyl alcohol
20	Geranyl acetate
5	Methyl ionone
150	Terpinyl acetate
50	Benzyl acetate
50	Amyl salicylate
20	Patchouli oil natural
4	Diethyl phthlate
550	

Note in this E.053 formula how the discoloring materials have been compromised. An extraordinarily large amount of coumarin has been used to compensate for the lost sweetness of the vanillin. The labdanum problem was solved by using the colorless, but more expensive, distilled oil. The loss of oak moss was compensated by using the greenness of hydratropyl acetate and galbanum, and the woodiness of methyl ionone. The floweriness was increased by a liberal use of amyl salicylate.

The amber fragrance is technically related to the chypre series, both in construction and use. Amber compositions, such as the one shown below, are consistently used in chypre make-up as sweeteners and fixatives.

AMBER FOR CHYPRES E.054

6	Amyl salicylate
5	Aldehyde C-12 MNA 10% in DEP
6	Isobutyl phenylacetate
10	Phenylacetic acid
10	Tuberyl acetate (Verona Chemical)
14	Civettiane (Perfumery Associates)
15	Benzyl propionate
20	Ylang Bourbon
20	Alpha ionone
20	Yara-yara
20	Heliotropine
20	Hydratropyl alcohol
20	Absolute castoreum
20	Aldehyde "Veronol" 10% in DEP
20	Oil myrrhe distilled
25	Musk xylol
30	Musk ketone
30	Petitgrain South American
30	Citronellyl oxyacetaldehyde
40	Oil lemon California
42	Amyl cinnamic aldehyde
45	Musk ambrette
60	Oil bitter orange
60	Methyl cinnamate
65	Coumarin
55	Methyl ionone
70	Oil labdanum absolute 10% in DEP
80	Ethyl vanillin
87	Phenylethyl phenylacetate
1,000	

The Amber E.054 is useful in all branches of the LFC group, and particularly for the preparation of men's cologne fragrances. It adds a touch of "luxury" to various floral fragrances such as carnation and jasmin.

The classifications of the LFC group must not be regarded as inflexible. Cross linkages between the subdivisions can produce striking effects. Lavender-

fougere linkages develop interesting and bright cologne types. In many instances a limited quantity of a finished chypre composition may be used as a modifier in this linkage. Conversely, the fougere group will also provide a freshening contrast in a chypre that tends to be too heavy. Considering the various cross-linkages possible and the number of floral adjuvants available, the prospects for creating attractive fragrances in the chypre group are better than in all the others combined. The best proof of this point is the high percentage of chypre types that are successful in commerce. The ratio of popular chypre fragrances as opposed to the florals, is about five to one.

AMERICAN FACTORIES

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the horizon is socialized medicine in some form. Our working people—and they have the votes—have for a long time now been reading about free medical treatment and free medicine both in England and in Russia. They will demand as much in the not distant future.

I fully expect that, while we may not go as far as England has toward socialized medicine, we shall go a long way and, as a first step, there will be some form of price controls on medical products. As in England, doctors will not be permitted to prescribe high-priced, trademarked specialties that do not differ in essential composition from other trademarked products or from standard stuff. In England trademarked specialties that are truly unique may be prescribed and can command, within reasonable limits, whatever price the manufacturer puts upon them.

In my opinion, we not only face state and federal government price limitations, we also face intensified competition here from our own friends in the trade, and from foreign invaders lured by the lucrative and extensive American market. Increased competition means two things, both costly: higher marketing costs and better, faster service to the trade. How are you going to meet higher costs, and almost certain profit percentage decline, and competitive prices and, at the same time, provide faster and better services, unless your factories and your internal and external organizations are as efficient as they can be made?

DENTIFRICE SURFACTANTS

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dreds of materials, and he is usually able to lay out his experimental formulation program covering the complex interactions with a set of simultaneous multiple parallel studies that gets the answers in a reasonable length of time.

Since the synthetic surfactants have become avail-