

# CREATIVE PERFUMERY

BY J. R. ELLIOTT, (PERFUME-FLAVOR CONSULTANT)

**A** considerable similarity exists between creative perfumery and musical composition, for both involve the constant search for basic ideas to be converted into themes and then fully orchestrated. As in music, the greatest problem in creative perfumery is to obtain a truly original idea for the theme. The inspiration for this new idea is often the result of contact with such diverse factors as flower gardens, the forest, fields, a new aromatic chemical or just pure imagination. Many superb ideas have been uncovered accidentally during casual experimentation or in the course of persistent analytical study of existing commercial fragrances. This latter procedure keeps fragrance thoughts constantly active in the mind and appears to be most effective in the creation of ideas for the fantasy types. Nevertheless, there is only one successful method for obtaining an original idea—a persevering search.

Once the basic idea has been established, the preliminary move is to decide whether it should be developed into a "straight" or "fantasy" theme. By far the greatest majority of themes selected are fantasies, since the "straight" class is highly limited in scope.

The subsequent step is to determine into which of the six perfumer's classifications the idea can be best fitted for elaboration into a theme. With the conversion of this idea into a theme the creation of the finished fragrance begins.

It is at this point that most novices encounter difficulty. They work faithfully to convert their idea into a theme and then into a fragrance; yet somehow the result seems incomplete and amateurish. This is because they have failed to recognize that a finished fragrance is not a single fragrance unit, but actually *three* separate fragrances working in harmony, which can be approximately subdivided as follows: 15 per cent "top" fragrance, 70 per cent "middle" fragrance, and 15 per cent "bottom" fragrance.

The "top" (also called the "topnote") is light and lifting—it is the brilliant opening note that sketches the identity of the total fragrance in a bold, sweeping movement. Usually it is built around the more volatile esters and the "light" essential oils and aro-

matic chemicals such as oil of bergamot and benzyl acetate.

The "middle", the principal part of the fragrance, consists of the theme as fitted into the category of available perfume materials.

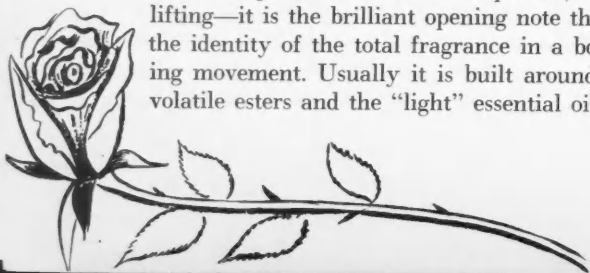
The "bottom" is the deep background and long lasting effect so desirable in good fragrances. It is usually constructed of high boiling point aromatic chemicals and nonvolatile resins, in such a manner as to suggest the "middle" fragrance. When the "top" and "middle" have evaporated after application of the fragrance, the "bottom" remains to give the illusion of great lasting power. "Top" and "bottom" must be carefully designed to harmonize with the "middle".

In creative perfumery, as in musical composition, there is no standard course of action that will lead to the discovery of an original idea. Many theories have been advanced concerning the technique of discovery, and much has been written on this fascinating subject but little real progress has yet been made towards an understanding. Creation is still a highly individualistic matter. Therefore, the author feels that a detailed illustration of the actual creation of a fragrance, accompanied by pertinent comment on the various moves, would be of greater instructive value to the student than the expounding of theories. No special claim is made for the procedure, but at least it will give the student perfumer something to think about, some point from which he can derive his own personal approach to the problem of creation.

## The Creation of "Rose Garden"

The inspiration for the idea behind this fragrance was obtained during a casual visit to the immense glassed-in research gardens of a large rose producer. In this giant greenhouse were literally thousands of various roses being hybridized and grown in an effort to produce a rose, distinctly new in shape, color and fragrance. Hence the composition to be created was named "Rose Garden".

The fragrance bouquet which assails the sense of



smell upon entering this research garden is intense and impressive. It is a complex blend of the many rose species present, coupled with the foliage and warm, moist soil in which the plants are imbedded. A close examination shows that this effect is based upon several contributing factors: the central portion of the rose yields the sweetest rose characteristic, while the outer portion yields a petal-like freshness; jasmin and honey appear to be the principal variants on the rose note encountered among the many species present, the older flowers acquire a musk-like note as they approach withering; the rose foliage produces a greenish, geranium like effect that heightens the sweet rose notes by contrast; an odor somewhat reminiscent of violet leaves emanates from the thick stems; the soil contributes a musky "earthiness" caused by its confinement in a close atmosphere. This analysis of the odor components of the original fragrance provides the theme—rose-jasmin-honey-musk-foliage-violet leaf-earthiness.

So far, the basic idea has been discovered, analyzed and separated into its fragrance components to establish a theme. The next step is to fit the theme into the practical framework of available perfume materials and effects.

As previously noted, a perfume consists of three separate fragrances: top, middle and bottom. Since the middle fragrance is the principal one, the design of the composition will start there.

ROSE GARDEN E.055. Obviously the principal note of this fragrance must be predominantly rose. Therefore the design of the composition will start with basic rose materials. To form the fragrance foundation the following alcohols are blended together.

- 100 Rhodinol
- 35 Citronellol
- 25 "Octadienol 1473" (Polak Frutal Works)
- 20 Dimethyl octanol

Each of these alcohols represents a different nuance of the rose type. Rhodinol possesses the deep, rich, red rose type. Citronellol, lying somewhere between the red and white rose in general character, is a (lighter version of the same effect; "Octadienol 1473" is a new synthetic alcohol which leans toward the peculiar rosaceous sweetness of the muguet. Dimethyl octanol is inclined toward the pungent waxy sweetness of the rose otto.

For the establishment of this base the rhodinol figure of 100 was arbitrarily chosen. This quantity of rhodinol was then modified by stepwise additions with citronellol. The resulting mixture was itself modified in the same stepwise manner with the "Octadienol 1473", and again with dimethyl octanol. This procedure of successive, stepwise modification is followed throughout the construction of the composition, and is the means by which the subsequent quantitative figures are arrived at.

It is important in this blending operation to work

for a pleasing effect without allowing one product to overshadow the other. The odor effect of the blend should be smooth at all times, for if one material is allowed to overshadow another, an effect known as "roughness" is produced.

The materials listed above distinctly recall the fragrance of the rose blossom, but in a rather waxy, fatty manner. Therefore, these characteristics must be minimized before proceeding with the development of floralcy in the composition. Using the stepwise technique previously noted, the following materials are incorporated to accomplish this change.

- 40 Phenylethyl alcohol
- 10 Hydratropyl alcohol
- 10 Tollyl alcohol
- 10 Cinnamic alcohol

Phenylethyl alcohol adds a rosy dryness that tends to mask the fattiness. Hydratropyl alcohol, somewhat similar to phenylethyl alcohol in its effect, possesses a more petal-like tone. Tollyl alcohol increases the efficacy of the phenylethyl alcohol and hydratropyl alcohol in their masking work. The cinnamic alcohol adds a spicy rosaceousness that minimizes the waxiness.

With this completion of this mixture the rose fragrance begins to take shape, but it is still drab and lifeless. Bright flowery touches of a contrasting nature must be added to sharpen the appreciation of the fundamental rose note. The following additions are made.

- 2 Phenylacetaldehyde
- 2 Ylang Bourbon extra
- 12 Hydroxycitronellal
- 2 "Cumin" ketone (Verona Chemical Co.)
- 2 Amyl salicylate
- 4 Terpeneol
- 20 Guaiac wood oil

Phenylacetaldehyde and ylang Bourbon extra suggest the hyacinth, which adds a very compatible floweriness to rose fragrances. Hydroxycitronellal contributes a nonspecific floweriness common to most blossoms. The "Cumin" ketone adds an exquisite flowery lift combined with a delicate woody touch often found in the white rose. Amyl salicylate and terpeneol form an exotic floral touch usually associated with orchid, which serves to emphasize the other components by contrast. Guaiac wood oil, which has a deep sweet odor connected with tea roses, acts as a blending agent by welding the new additions into the existing composition as a harmonious whole. These items are not present in sufficient quantity to be felt spectacularly, but nevertheless they play a definite role in the structure of a rose fragrance.

The total mixture, which has a definitely rosaceous fragrance suggestible of a bouquet of many varieties is the "middle" part of the fragrance.

Guaiac wood oil is used along with the following

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for the drug in question. Chemical derivatives such as salts and esters, can be evaluated. Complexing agents and metal chelates could be tried in order to obviate this local irritation. When the local irritation of intramuscularly administered Terramycin was observed, all the above measures were tested. It was found that the addition of magnesium chloride was able to eradicate completely the local irritation. This beneficial effect of magnesium ion is explainable when one realizes that Terramycin is capable of chelating metals. Thus, the magnesium ions are chelated by the Terramycin molecule. The various groups in the molecule that are part of the chelate structure cannot exert any local irritation. Similar measures, I am certain, will be tried with many of the new chemotherapeutic agents that show any local irritation after parenteral therapy.

The sterilization of parenteral solutions, suspensions and powders will be carried out much more effectively in the future. Many industrial firms, are evaluating the use of radioactive materials, sound waves and more effective chemical sterilizing agents. These investigations will undoubtedly lead to improved sterilization methods.

### Topical Products

The thorough study of skin lipids that is being carried out under Dr. Higuchi's direction at Wisconsin, will help us to design superior topical preparations. Professor Christian at Purdue University has demonstrated an excellent way to follow the depth of penetration of topically applied drugs by the use of radioactive tracers. Such fundamental studies cannot fail to influence the future development of topical products. The great interest in aerosol packaging of topical dosage forms will continue to grow in the years to come. Several companies are setting up laboratories for the study of aerosol packaging. When superior topical efficacy can be proven for medications applied as aerosols, we should see a great increase in the use of aerosolized drugs.

### CREATIVE PERFUMERY

(Continued from page 453)

additions in the construction of the "bottom" fragrance. The Guaiac wood oil is used for its tea rose character which is very long-lasting and suggestive of the "middle".

- 30 Benzyl salicylate
- 6 Isoeugenol
- 10 Phenylethyl phenylacetate
- 8 Isobutyl phenylacetate
- 4 Methyl ionone
- 8 Musk xylol
- 15 Musk ketone

This "bottom" mixture resembles the "middle" and is comprised of materials high enough in boiling point (i. e. slow to evaporate) to act as a fixative

for the total fragrance. As the more volatile items of the total fragrance evaporate, this "bottom" part remains to constitute the last lingering note that recalls the total fragrance. Its lasting power produces an illusion of persistence in the total fragrance.

The final portion of the design is the creation of a "top" note. For this work, esters and ester-containing essential oils are favored. The following are the additions made.

- 6 Oil lemon California
- 4 Oil bergamot
- 4 Tylol acetate
- 16 Citronellyl acetate
- 8 Dimethyl octanyl acetate
- 6 Phenylethyl propionate
- 2 Muguet aldehyde (Van Ameringen)
- 2 Aldehyde C-12 MNA 10 per cent in DEP
- 2 Hydratropyl acetate

The oils of lemon and bergamot produce a light, "flashing" citrus note. Tylol acetate is relatively mild, but serves to suggest jasmin fragrance, which will be dealt with later on. Citronellyl acetate, dimethyl octanyl acetate and hydratropyl acetate produce light rose-petal notes of varying nuances.

Phenylethyl propionate gives a dry rose-petal touch. Muguet aldehyde and methyl nonyl acetaldehyde (Aldehyde C-21 MNA) provide a piquancy and contrast. The function of a "top" note in perfumery is equivalent to the "overture" in music—it suggests what is yet to come. The foregoing items were selected because they suggest the remaining parts of the total fragrance, and because they qualify in volatility or in lifting power for the position of "top" note.

These last "top" items complete the picture—a rose fantasy suggesting many species. The next problem is that of "dressing up" this fragrance to simulate the idea first recognized in the greenhouse.

This "dressing" operation is begun with the introduction of the musky and earthy tones.

- 2 Mousse de Chene (Oak moss)
- 20 Astrotone BR 100 per cent
- 6 Tincture ambergris 4/128

The mousse de chene suggests the fresh pungency and greenness of recently turned soil. Astrotone BR. 100 per cent gives a sweet musky lift suggestive of slightly decadent rose petals, and it also helps to blend the total fragrance together. Ambergris provides a distinct, earthy note that harmonizes with the Astrotone.

To simulate the effect of the foliage and stems, the following materials are used.

- 8 Geranium Bourbon oil
- 4 Oil galbanum distilled, 10 per cent in DEP
- 1 Methyl heptene carbonate 10 per cent DEP

The geranium Bourbon oil obviously gives the geranium note indicated in the original idea. The galbanum oil suggests the pungent, bitter greenness of

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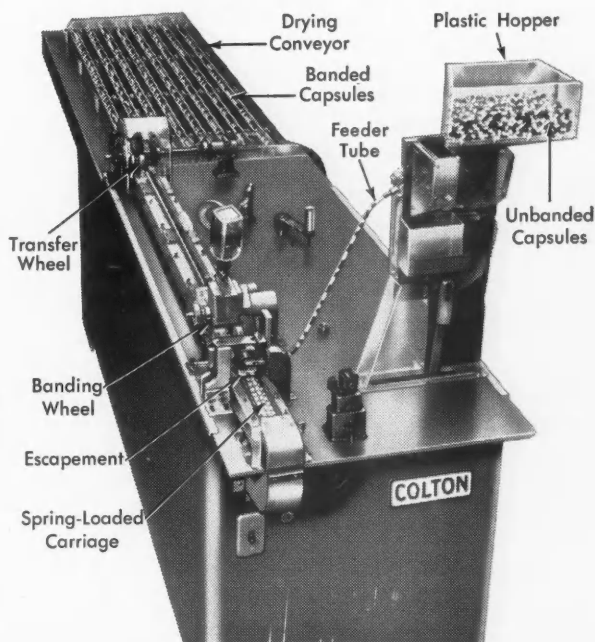
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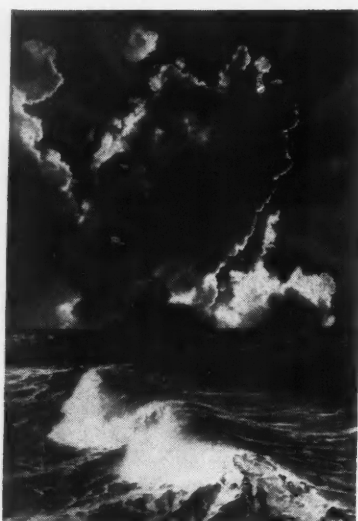
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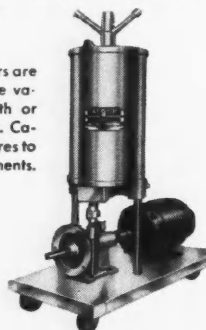


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the leaves and stems. The methyl heptine carbonate adds the violet leaf odor of the thick stems.

The shadings of honey and jasmin found in the many species of rose growing in our research greenhouse and forming a part of the total fragrance are too complex to be produced by a few chemicals. Special compositions (also called "specialty bases") are used to add these two effects.

To insure compatibility with the total fragrance, the honey note is introduced with a complete honey fragrance, the Miel Supra E.030. It fits into the design thus:

60 Miel Supra E.030

4 Rose otto natural

The rose otto is used to give added richness to the honey composition.

The jasmin nuance is supplied as follows:

25 "Golden Jasmin" E.004

All the items enumerated so far constitute a total fragrance representing the original idea in a complete stage of development. Its odor is pleasant when examined on a perfumer's test blotter, but there is one final factor to be considered—wearability. A fragrance may smell beautifully on a test paper, yet when applied to the skin may change in effect, often unpleasantly. Adding materials to correct this situation is known as "improving the wearability". Experience has shown that materials with an animal or animal-flowery note, such as civet, musk tonquin and castoreum, are most effective in insuring wearability.

Civet has a combined animal-floweriness in spite of its apparently revolting odor in concentrated form. Musk tonquin is a sweet "lifting" animal note, but possesses a by-note on evaporation that can interfere with delicate fragrances; musk tonquin is widely used, but requires skillful application. Castoreum, the least expensive of this trio, possesses a rich, heavy, animal note. Because of its smokiness, its use is somewhat restricted.

In the design of "Rose Garden" civette was selected and used as follows.

4 "Civettiane" (Perfumery Associates Inc.)

Consideration of the wearability factor may seem trivial, but its neglect can destroy the effect of an otherwise potentially attractive fragrance. It is surprising to see how often this factor is neglected in the creation of a fragrance.

### Summary of Creative Procedure Illustrated

In the foregoing illustration of creative perfumery its development proceeded in this sequence.

1. Inspiration for the original idea
2. Analysis of this idea and its break-down into a theme.
3. Selection of the principal note of theme.
4. Fitting of this principal note into perfumer's classifications.

5. Conversion of principal note into "middle" part of a fragrance.
6. Addition of "bottom" part to build up this fragrance.
7. Introduction of "top" part to complete principal fragrance note.
8. Introduction of the variants of theme into the above fragrance.
9. Completion of design by incorporating wearability.

The above illustration of the creation of a fragrance is given with the hope that it will suggest some approach to creative perfumery. However, since creation is a highly individual matter, the best suggestion that can be made is to approach creative perfumery with an unprejudiced attitude and a willingness to experiment by trial and error. Eventually the individual will evolve a creative technique compatible with his personal skills.

#### Caution on Blending Technique

In the earlier part of this article mention is made of the technique of blending together the various ingredients to produce a smooth overall effect. Overblending, a mistake frequently made by beginners, results in a characterless fragrance. "Off" or "rough" tones, when used discreetly, create a contrast that emphasizes the beauty of the ensemble. Americans seem to prefer embodying the contrast created by these rough tones, whereas Europeans lean toward perfumes embodying a degree of smoothness that borders on overblending. Therefore the perfumer must take into account the clientele most likely to use his creation.

#### Specialty Bases

In this "Rose Garden" fragrance two compositions, "Golden Jasmin" and "Miel Supera" are indicated. By the manner in which they are employed they can be classified as "specialty bases". Perfumers are constantly faced with the decision of whether to make or purchase these bases.

The argument for making them is based upon the positive assurance of quality maintenance, and of course a strong element of personal pride on the part of the perfumer.

The argument for purchasing them is that a greater range of originality is made available, since many commercial specialties represent artistic and chemical research far beyond the capabilities of any single individual. Furthermore, many of them owe their originality to "captive" aromatic chemicals, which makes their simulation with any degree of accuracy, an impossibility.

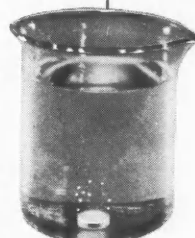
When the financial restrictions on a given design are unusually "tight", there is strong justification for the perfumer to use his own specialties, or make approximate matches of commercial items. But, given normal freedom, the decision to "make" or



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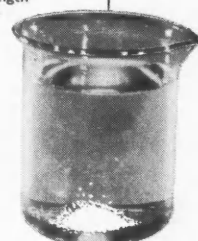
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"purchase" a base should be determined by purely artistic considerations. No one individual can encompass the entire field of specialty bases, therefore, if it will contribute to the effectiveness of his artistry, it is perfectly legitimate for the perfumer to use a purchased base.

A good creative technique can be cultivated only one way—the hard way, by continuous application and exploratory research. If it were easily acquired, the entire status of perfumery would be different.

A final bit of advice is to forget that the aromatic materials are chemicals, and regard them only as instruments for the creation of a fragrance, and odor effect.

### PATENT THOUGHTS AND TRENDS

(Continued from page 481)

cious anemia factor. A number of fermentation products derived from the growth of several species of microorganisms were investigated. The results were not promising, until on September 16, 1947, there was produced a composition within the terms of claim 1 of the patent. These compositions were obtained in the eluates of the residue in "spent" Norit after elution of the grisein materials which previously had been adsorbed from the acidified broth of the microorganism, *Streptomyces griseus*<sup>3</sup>. While grisein, itself, contains none of the desired activity, there followed an intensive search of grisein materials and experimental extraction, concentration and fractionization to obtain the desired substance. On October 22, 1947, a fraction having a pinkish color was obtained. This color deepened as further concentration and separation were achieved, until, finally, on December 11, 1947, a pure, red, crystalline material was obtained.

A short time thereafter, other employees of Merck, who had continued to work with liver, succeeded in isolating a pure, red, crystalline material which, upon analysis, was found to be identical in chemical structure and function to that obtained from fermentates. Clinical tests proved the material derived from both sources to be the anti-pernicious anemia factor, and chick tests proved it to be an efficient growth stimulant.

After much additional analysis and investigation, officials of Merck decided the pure material could be classified as a vitamin. Since it was water-soluble, it was placed in the "B" group, and was assigned the number 12, all lower numbers having been appropriated.

### CLAIMS

The court was concerned with 3 product claims of which claim 1 is representative:

"1. A vitamin B<sub>12</sub>-active composition comprising recovered elaboration products of the fermentation of a vitamin B<sub>12</sub>-activity producing strain of Fungi selected from the class consisting of Schizo-