The Investigator and the Perfumer

Exchange of ideas (translated from French) between Prof. Maurice Chastrette of the Claude Bernard University in Lyon, Laboratoire de Chimie organique physique, and Edmond Roudnitska, in September 1981, with regard to his book "Le Parfum." Que sais-je?–P.U.F.–1980.

M.C.: I am impressed by the optimism of your opinions on the sensory capacity of the average man or woman—an optimism which is even more striking to me as a teacher than as an investigator.

E.R.: My opinion concerning the sensory capacity of the individual is not based on optimism, but rather on experience—experience which I have accumulated from the development of my own ability to perceive (and to reflect) in the course of 55 years devoted to the practice of olfaction; and also the experience of having witnessed the developing capability of a great many people during this lengthy period. My convictions are well-founded: we all sense things in pretty much the same way; what does vary, most of all, is our skill at interpreting our sensations (in other words, to perceive). This skill can be perfected through training. The ability to perceive is thus in essence a matter of being able to learn and to reflect. Obviously, there are people for whom this will be more difficult than for others. To perceive is to sense while reflecting, as was keenly pointed out by Mr. Henri Piéron in his fine book on Sensation.

M.C.: I have asked myself whether or not we dream of odors in the same way that we dream of landscapes or of sounds. I don't think it has happened to me.

E.R.: I don't think that I have dreamed of odors either, even though it seems to me to be just as much a possibility as to dream of any other sensation whatsoever. Nevertheless, on page 81 of "L'Esthétique en question" "Aesthetics at issue") I have recounted a quite recent dream that involves olfaction.

What I have indeed experienced on three or four occasions, and this while fully awake, are olfactory hallucinations. Quite fleetingly, for one or two seconds, I believed that I was smelling strawberries or jasmine, for example, without the least plausible reason. It was not at all as if I had voluntarily recalled such odors to mind; rather it was something spontaneous and thoughtless, brief but clearer than if I had voluntarily recalled it to mind. I attribute this phenomenon to a particular restlessness of mind (such as a latent preoccupation that escapes the awareness of even the person experiencing the phenomenon) which, when most acute, finally acts upon the cerebral structures to take on the configuration which corresponds to strawberries or to jasmine. For the space of a second we believe that we are indeed experiencing this olfactory impression; however, since it is not based on any real stimulus, nor on any willful effort, it is very fleeting. I would even think it required a high degree of alertness and a sharp sense of discrimination to catch it on the bounce and identify it.

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M.C.: The artistic concept of a perfume as a combination of qualities, of intensities and of duration prompts the investigator to provide measurements of these intensities and durations that might be put to practical use by the creator of scents.

E.R.: I am glad to hear this because, by assuring me that I have been able to enlighten and to convince the investigator—which is what you are—you leave me with the hope that I have convinced others and thus attained my goal.

M.C.: The description of olfactory "form" is a detailed one and I hope that I have understood the nuances implicit in the notion of "form." I don't have too many difficulties with such metaphors as "spirit common to all the scents of rose" or "artist's rendering, bare and unadorned."

E.R.: What you have quoted is proof indeed of your understanding. Beyond any doubt, these are arduous topics. One begins by evolving things in the abstract; one struggles with them; and one would really like to be able to rely upon the concrete. That is still not possible, but in any case one relies upon what has actually been experienced—it is not the stuff of dreams, it is the stuff of reality.

If that which has been authentically experienced is described as simply as possible, as it is also experienced by others, it is bound to awaken echoes and thus spur the investigator to transform the abstract into the concrete. This has already been achieved in the case of sight and hearing, for indeed there were painters and musicians before it was possible to measure colors and sounds.

I am hoping that my reflections, however akward and imperfect they may be, will nevertheless serve as starting points for the construction of more substantial—and more definitive—theories.

A British specialist in perfumes asked me to describe as simply as possible, for a magazine, what I understand by the expression *olfactory form*. Here is my reply:

"When you hear a very well-known musical tune, even if you have never learned simple scales or an instrument, even if you are completely uninitiated in music, you nevertheless recognize immediately the tune in question, even without hearing a single word that goes with this tune. How is it that you recognize this familiar tune? Quite simply by its *musical form*. Thus you have in your mind a certain number of *sound forms* which correspond to all the tunes that you know and that you are capable of identifying as soon as you hear them.

In the street or in a drawing room, when you smell a woman who has scented herself with a very well known perfume, like *Arpège* as it was years ago, even if you are uninitiated in the perfumer's art, even if you have never heard anyone discuss compounding and essential oils, and are totally ignorant of what goes into a perfume, you will nevertheless instantly recognize the perfume of that woman. And why would you be able to recognize it so quickly other than by its particular *form*—that form which causes you, despite your utter lack of training, to distinguish it perfectly from *Shalimar*, for example, which in your memory corresponds to a different *olfactory image*.

"You are asked to close your eyes; then a marvelous red rose, freshly in bloom, is brought near your nostrils, and you are asked what you smell. What do you reply forthwith? but of course, it's a rose! Nor would you hesitate any less—again with your eyes closed—over a bouquet of violets. How is it that you are able to distinguish all these odors, all these perfumes, so easily? By their form, by their characteristic form, by their *olfactory form*. In your mind they all correspond to particular sensory configurations which you classify well in your mind.

"If you have been in love with a woman who used *Arpège*, and if, several years later, someone mentions in your presence the name *Arpège*, won't your mind call forth the particular form of this perfume just as quickly as if you had the bottle right under your nose? It's the *olfactory form*—it's as simple as that, and yet you imagine such forms daily without being especially aware of it."

M.C.: I have recorded the idea of a perfume unfolding itself over a period of 24 to 48 hours. I have also recorded the comparison between musical chords, on the one hand, which are perceived in the passage of time, and olfactory chords, on the other hand, which are perceived rather as simulaneous harmony. But

aren't there also olfactory chords in the passage of time when a perfume unfolds itself quite rapidly?

E.R.: I have stated that the olfactory chords are more like arrangements of the contrapuntal type since many of the constituents are superimposed on one another (by conjugation) during much of the evaporation. But, as we are well aware, in continuously variable proportions (See *"Que sais-je?"*, pages 37 and 38).

I have also stated that there is, nevertheless, a melodic line, since the overall form of the perfume changes appreciably in time by means of evaporation, due to those variations in proportions. Thus, both music and perfume are very much arts which evolve in the course of time; however, perfume does so with a much slower rhythm, except throughout its first phase (unstoppering of the bottle) which will last for a few minutes, or perhaps an hour. This is already the duration of a concerto or of a symphony, whereas the unstoppering of the perfume is only a prelude.

In the course of this prelude the lighter constituents come forth sooner and more quickly because they are more volatile. Hence the interest in having precise physical details on such activity. But this is a complex matter: it is not just physical but also aesthetic; the individual forms undergo conjugation by superimposing themselves on one another, in such a way that counterpoint and melody coexist in the course of that rapid evaporation which constitutes the prelude-like unstoppering.

In order to avoid any misundersanding on the subject of this comparison between olfactory chords and musical chords, I should add that, with the notion of *olfactory form,* which entails the notion of the "overall form" of a perfume, the idea of "chords" is now somewhat out of date. To be sure, when one brings together a number of odoriferous substances—each of which possesses an individual form—they are more or less going to harmonize with one another (or occasionally conflict or clash) in order to give rise to a new resultant form, which will be more or less durable.

For a long time and up until the last few years, the majority of composers were accustomed to conceive of their work only in terms of "chords". They would seek a chord between two or more substances, in the hope that a new (and interesting) "effect" might result therefrom. They would "wrap up" this chord using classic processes: fresh substanes, floral substances, lasting substances all the while praying to heaven that their initial chord would not be distorted, which unfortunately is what quite often happened. When they became so bold as to combine several "chords", which had been worked out in advance, the result would be even more haphazard, more fragmented and more unsatisfactory. I am speaking from experience because of course, I went through this as a beginner.

By conceiving, by imagining, by inventing not just a single chord or segmental chords, but the *overall form* of the perfume (more or less vague, more or less precise), as sketched in the mind, the notion of chord becomes subordinate. To be sure, it remains possible that it is the odor of a substance or the combination of two or three substances that is where the creation of the form of a perfume originates, but that substance or that chord will have been no more than the pretext for imagining the overall form of the final perfume.

The idea of the form of a perfume, through association of ideas, intuition, wager, etc., can be born of any pretext whatsoever. But it is well known that the same thing is true in all artistic activities, whatever the sensitive premises thereof may be—even in scientific research which owes so much to the imagination. So then, why ought one to be astonished if the composer of perfumes were to embrace the form of a perfume right away, the idea of which has just come to him?

When the mind—by way of a mental representation, the origin of which may vary—has assigned itself a *schema* (if this word is to be preferred to "form") of perfume, all that remains for the mind to do is to give concrete expression to this schema of perfume by drawing up a form . . . ula. What is to be put into this formula? It is *technique*—that is to say, professional skill—built upon knowledge, that is going to suggest it. And it will be all the less difficult where the knowledge is vast, and vice versa.

If I continue to speak now and then of olfactory chords, it is due more to convenience of language than to evoke their concrete reality. This is why I would be more inclined today to liken the compositon of perfumes to architecture rather than to music. A perfume is very much like an architectonic construction, an assemblage of materials, a building that rests on a foundation, that grows in volume and which culminates in a crowning—the entirety of which (after removal of the stopper) can be taken in at a glance (that is, with a whiff), and from which an

impression of harmony looms. It would thus appear that the artistic compounding of perfumes cannot be left to the efforts of dilettantes or amateurs. Up until 1939 the highest circle of perfume-making numbered, first and last, five or six authentic artists who shared the market among themselves. Today our profession is crowded with a multitude of amateurs who are no longer free even to work by following their instincts.

M.C.: I was also impressed by your defense of synthetic perfume, in other words, of the nobility residing in man-made materials.

E.R.: I have pointed out that all perfumes, insofar as they have been compounded, are necessarily synthetic—that is to say, syntheses of diverse elements. But I have defended the "synthetic" substances because the great olfactory value of many of them is evident, and because the attribution of a disparaging sense to the term "chemical" is foolish and tactless.

It is a matter of presenting facts and not beliefs. The belief which was implanted in the public mind is that chemical substances are nothing but mediocre "ersatz" compounds. What should have been made amply clear is the fact that all the products of nature, from the simplest to the most complex, are composed of chemical substances. When we pointed out that it took men only a few years to perform syntheses for which hundreds of thousands, nay millions, of years had been required of nature, we placed a high value on that work. Man himself is, one would do well to emphasize, a very fine product of nature, but a "chemical" substance nevertheless and, in fact, a chemical factory.

M.C.: On the subject of composition, I can well imagine that, with experience, it should be possible to foresee the chord from a number of components. But is it possible to foresee the evolution that a perfume will undergo while it is standing in an alcoholic solution? And how? Are there well-known effects by certain substances that would react particularly well to alcohol or else that would catalyse other reactions?

E.R.: To some extent it is possible to predict the evolution of a substance or a mixture in alcoholic solution, in exactly the same way as you imagine it possible to anticipate chord among a number of components—with experience.

Ethyl alcohol is one of these components: its driving and propelling physical and dynamic actions are complemented by chemical properties which are difficult to pin down (slow but probable esterification and, among other things, oxidation), but which can be *verified* by close and patient observation. First one observes carefully; then one repeats and confirms (that's what you do, isn't it?), and finally one drafts a line of reasoning in an attempt to explain the connection between the causes and the effects. It is repetition of olfactory observations submitted to close scrutiny and thought that makes it possible to understand the behaviour, in ethyl alcohol, of certain of our materials and essential oils.

We must feed this knowledge into our cerebral computer, thus enriched daily with data that it will compare and memorize (we are dealing with olfactory images that cannot be recorded graphically). From these constant data-processing activities our cerebral system will finally deduce certain general patterns of actions and interactions of our substances, with one another and also in ethyl alcohol.

Thus, when alcoholic solutions have been preserved for months, and even years, the liqueur-like character which they more or less take on is noticeable. An observer who has undergone long training would be able to determine, with a rather narrow margin of error, the age of the solutions. Since the reference marks are altered in the course of time, it is not difficult to tell which of two solutions is the older.

The liqueur-like effect induced by aging in alcohol is the most frequently occurring and most easily verifiable effect. Every day I have occasion to sniff raw materials in alcohol solutions at various concentrations and of diverse ages, by comparing an old and a new solution of each substance. Thus it happens each day that I am able to draw conclusions about how they alter. Well then, it suffices to remember and to extrapolate in order to be able to predict.

Liqueur-blenders would doubtless be able to speak at greater length than I on this subject. And likewise the wine-producers, who also note the liqueur-like effect on wines after excessive

aging.

It is possible and even probable that alcohol has yet other effects, and even a catalytic action; but where would I find the time to study such details systematically? I note the characteristic features to the greatest possible extent, and I assimilate them to nourish my intuition which does the rest. The results are not so bad nor are they so unreliable.

I have been struck, for quite some time now, by an effect other than the liqueur-like one. It is the effect caused by the introduction, into alcoholic solution, of a mixture which is relatively simple but in which Ilang-Ilang and total ionone have been placed together. After a while, it was not a liqueur-like impression that the solution produced, but instead an oily, rather sickening impression. This oily characteristic is also very recognizable, inopportune and an inappropriate and disagreeable olfactory form, unsuitable in the composition of any perfume.

I have observed this development three or four times in the course of my career: In every case Ilang-Ilang and ionone were in the formula, and each time the oily effect subsided when one of these two constituents was either diminished or eliminated, thereby establishing their responsibility. Since, in many mixtures, both Ilang-Ilang and ionone are present at the same time without, however, the oily effect being produced, it is thus to be inferred that the effect results from a certain relative proportion of the two substances, or that in a very complex mixture the oily effect is either obliterated or masked by its surroundings.

That is only one among the very numerous specific cases with which we are constantly confronted in our profession and which unfortunately limit our ability to generalize and even more so to recommend rules.

The changes that occur in alcohol, which are rapidly set in motion—from the earliest hours and thereafter very gradually—are a source of problem to me every day. Between the solution of the substance as delivered, on the one hand, and the sample which was submitted barely a fortnight earlier, on the other hand, there are occasionally such great differences that I begin to doubt the good faith of the supplier.

Since the influence of the aging process becomes blurred after a few hours of evaporation, I can then check my first appraisal and either confirm it or rectify it by yielding to modifications. In questionable cases I have a fresh solution made up again from the sample. This illustrates the influence of the aging process in al-

cohol; it shows the precautions that are mandatory for us and the prudence that is necessary in every judgment. A hasty judgment runs the risk of proving faulty, which does not gainsay the obligation to maintain an alert mental attitude so as not to lose sight of the parameters that ensure this judgment.

M.C.: When you describe the genesis of the work of art, you focus on the role of intuition. Even though everyone other than the creator necessarily remains on the outside, I believe I have understood how your creation comes about.

E.R.: I find it very reassuring that you appreciated that attempt to analyze the genesis of the work of art and that you have truly understood the role which intuition plays in it. What you add proves indeed that you have penetrated absolutely the creative process. Thus you assure me—and this is very important for me—that my text, although difficult to present, is nevertheless not obscure; and you, who are a total stranger to composition, you are giving a good lesson to would-be composers who have not understood anything. But the wording in *Que sais-je?* is only a summary of the same chapter in "L'Esthétique en question" ("Aesthetics at Issue"), where the original text is not abridged.

M.C.: I am very much in agreement with you concerning the role of chance, or rather of the idea that is drawn from it, insofar as discovery in our science resembles creation in your art.

E.R.: For a long time I have wanted to express my feelings about chance—that poor excuse from people who are ineffectual, lazy, envious or unthinking. So long as one does not rely on chance, one will be all the more capable of exploiting it when it does arise; and, since one will have done many things to provoke it, it will not truly be chance. Even though I did not study medicine, I have a deep affinity for Claude Bernard, for the man, for his ethics and for his simplicity. He himself was a man of great intuition, but also a man of the scholar-artist breed, which explains his genius and his success. For him, chance was not the unexpected, but rather an element of probability which therefore did not catch him off his guard. And finally he reached the point of being able to foresee chance. On page 121 of "L'Esthétique en question", this theme is developed somewhat more.

M.C.: I have not understood well what you call "technique" in the conception of a perfume, doubtless perhaps I cannot quite keep up with you.

E.R.: "Technique embraces the entirety of the *means* which are brought to bear in order to achieve the goal envisioned by the artist" (*Que sais-je?* page 84). That seems to me to be clear enough and quite distinct from the "conception" of the work, which depends upon inventiveness and which is going to get the mind involved in imagining the goal in question. This definition of technique is not limited to the composer of perfumes; quite the contrary, one would do well to apply it generally to every artistic creation, so as to demonstrate that our activity is of the same nature.

Admittedly, painters and musicians apply a technique; inevitably it is the same in the composition of perfumes, otherwise we would be leaving everything to chance, not only when conceiving the work but also when carrying it out.

Technique is painfully compiled from tens of thousands of olfactory observations which have been subjected to reason: a given substance reacts in such a way when dipped, later, and then even later; and in such ways when I combine it with such and such other substances, in such or such proportions, at such and such times during the process of evaporation. This substance blends well with that one, very badly with that other one, but best if I add this to it (herein lies a likeness with painting). I observe such a result from such a more or less complex combination, or else I observe that this substance enhances that other one, or that, on the contrary, it obliterates or "kills" the latter.

I note, for example that Benzyl Acetate and Amyl Salicylate "boost" each other mutually and that, if an excess of one is noticed, sometimes it is the other which must be reduced.

By dint of multiplying the combinations of odoriferous substances, one ends up by recording in one's cerebral computer the relative values of quite a number of components and a reasonable range of uses for each of them. This is not meant to exclude those potentially bold strokes (for example, *Chanel No. 5*) such as may happen in the wake of an intuition (see this chapter in "L'Esthétique en question").

It is all the result of knowledge that has been patiently accumulated; technique is nothing but this knowledge put into practice. What I stated in reply earlier with regard to the evolution of

alcoholic solutions is also technique. But all these observations and all these reflections must be applied with strictness: strictness in the conditions under which tests are conducted (meticulous attention to details; comparing only those things that are comparable); strictness in the inferences that are drawn from tests, so as to avoid any irrelevance. A true strictness of mind depends less on a scientific education or on technique than on the training of personal character. Teachers ought never fail to recognize this, and they must stick to educating personal character first of all.

The establishment of a proven technique is not limited, even after multiple observations, to a sort of repetitive routine of what one has learned, with the systematic application of recipes and processes. Such might perhaps lead to fair achievements, but not to veritable works of art. A sure and effective technique has only been able to come into its own by appealing constantly, in the course of research, to the imagination. If imagination is a springboard to creativity, it cannot be absent from the technical work for which it must be the prime mover and renovator. This is why the best technician will often be the most capable of inventing and also be the best creator. This is what I wanted to say when I wrote that technique is inextricably linked to creation—that it comes to be creation itself (*Que sais-je?* page 85). The artist who is also a good technician is not at a loss to nourish his research; his technique can easily provide him with numerous pretexts for achievement.

A very thick volume could be written on the technique required by the composer of perfumes, if one were only sure that it would not be exploited by looters. The reading of the chapter on technique (*Que sais-je?* page 83; *L'Esthétique en question* page 190), in the light of what precedes, ought no longer lead to misunderstanding. It goes without saying that when I speak of recording my observations in my cerebral computer, it is for the sake of simplifying since we are of course dealing here with something that is infinitely more complex and subtle, with my small (quite small) *active memory*—that which has inspired our friend Sauvan (*L'Esthétique en question* page 155). And may I add that when I think of the brain size of a bee or an ant, it makes me terribly modest.

M.C.: I am convinced by your arguments concerning the rights and the safeguarding of artistic creation in the field of perfume, and I approve of your struggle to protect the quality of French perfumes.

E.R.: This problem involving the defense of creativity (and not only in France) is fundamental for the survival of an artistic compounding of perfume, which is under attack from all sides. To succeed as quickly as possible—anything else will be too late—active and militant help from men of science is indispensable and of first importance. It is they who must come to grips with this issue, who must point out at the very start that it is right to be so concerned, who must present the problem as it must be presented, and who must indicate how it can be solved. The purpose must be to enlighten the top-management echelons of perfume establishments, to make them conscious of their rights as well as of their interests, to instill them with confidence and to mobilize their energies for the defense of these rights. It is likewise incumbent upon men of science to supply arguments to members of the legal profession.

Your research efforts, which pursue goals of general interest like those which our Foundation has set for itself, must never lose sight of the need to defend creativity, and, stone upon stone, must contribute to the building and strengthening of this defense. The best way to assist in this struggle is to supply us with the means for defining our forms and to increase such means, as well as to quantify the attributes of our perceptions.

M.C.: In closing, I shall say that I have read your book with twofold interest:

That of the "honest layman" who now understands better how to appreciate a fine perfume and how to restore it to its proper period.

That of an investigator engaged in determinations, the scope and usefulness of which I now grasp better.

E.R.: These last words of yours warm my heart and reward me for so many efforts which are not always so well understood. I thank the "honest layman" for his interesting comments and for his pertinent questions which, by stimulating me to reflect even more, have enabled me to deepen my own thought.