

industry. Oil of spearmint, some natural wintergreen, the ancient cedarwood and rank wormwood are also secured in the United States. Citrus oils are extracted from our lemons and oranges. But the natural oils produced in this country, though important, do not include any of the gems of the perfume industry.

Natural oils may be extracted in several ways. Steam distillation, the cheapest of the methods, is used in extracting a wide variety of oils that come from all parts of plants that are grown in many parts of the world. It is used for sandalwood that comes from a tree; vetivert, that comes from roots; and patchouli, that comes from leaves.

The roots, leaves or twigs are boiled in water. Steam blown through the mixture carries the vaporized oil to a condenser where the water and oil are condensed as liquids. Because the oil is not miscible with water, it can easily be removed. But many of the most delicate and expensive flowers cannot be treated in this way, as heat and water change their character and destroy their value.

A process that has changed little in the past few centuries is that of enfleurage. Flowers brought fresh to the factory are placed by hand, a few hours after being picked, on glass trays coated with fat, primarily lard. The petals are allowed to remain in contact with the fat for about a day, during which time the odorous constituent is absorbed from the flowers. The fat is then washed with alcohol or benzene to separate the perfume from it. This hand process still is used extensively in France to recover the perfume from jasmin and tuberose.

One of the oldest processes for the extraction of oil is maceration. It consists of immersing the flower in warm fats or oils. For this purpose, the ancients used olive oil and other vegetable oils, but today, where this process is used at all, animal fats are employed.

A volatile solvent such as petroleum ether or benzene is used to extract the natural oils from such flowers as orange blossoms and mimosa and is also used for the jasmin. By a series of processes the natural oil is transferred from the flower to the solvent, which is then evaporated, leaving the perfume oil.

Such odors as oil of lemon and other citrus products are extracted simply by pressing on the peel, a process known to the industry as expression.

A thorough description of these processes and of other aspects of perfume and odor is found in Edward Sagarin's

recent book, "The Science and Art of Perfumery."

Three types of ingredients are used in the making of perfumes. Odoriferous components such as natural oils and synthetics supply the main part of the perfume odor, and impart the pleasing fragrance. A large variety is usually employed, perhaps a score or two in a single perfume. Then there is the diluting agent, a specially prepared alcohol. This may either be produced by fermenting molasses or grain, or it may be created synthetically. The fixative blends the many odors into one and gives the perfume its lasting quality. Good perfume will keep its same fragrance for many hours on the handkerchief or hair, and for many years in a well-sealed bottle.

Until recently the fixatives were exclusively of animal origin and so great was the demand for musk that the male musk deer of Tibet, from whose glands the natural musk grains are extracted, was in danger of being exterminated. A means was recently found, however, of using the tiny glands of muskrats trapped in Louisiana's bayous as a fixative. This new natural musk, made possible through discovery of a way to oxidize the almost odorless musk alcohols and convert them to the extremely odorous musk ketones, has proven an excellent fixative.

A number of musk substitutes has been developed, but while somewhat similar to natural musk in their odor effect, they cannot be said to have the power, strength or depth of natural musk.

A sweet odor alone is not pleasing. To obtain the most liked fragrance, combinations must be chosen from the four types of odors—sweet, acid, burnt, and the unpleasant group known as goat odors. Some of the most valued substances for perfumes, such as civet obtained from the civet cat of Ethiopia, are extremely evil-smelling. These materials have been of special importance lately because most of the perfumes popular today contain one or several unpleasant odors, used in small proportions where it becomes a part of a pleasant bouquet.

Perfume experts are continually mixing essential oils and synthetics in minute quantities to create new perfumes that will be subtle and lasting in their fragrance. But the final test for a good perfume lies with the olfactory senses. No machine has yet been invented that can analyze smell—the human nose is still the superior perfume sniffer.

Science News Letter, May 11, 1946

ASTRONOMY

Sailors Report Seeing Sky Fireworks

► THE OLD SAYING that all a sailor sees is the sea is refuted by reports of celestial fireworks received by the U. S. Navy Hydrographic Office.

Sailors have seen a red and yellow meteor flashing through the skies over the Atlantic and another greenish-white fireball with a small tail. A ship's officer in the Caribbean reported a bright greenish-blue meteor.

Even seeing the sea can have its interesting side, too, for a ship in the Pacific off Panama reported sailing through large patches of maroon-colored water.

Science News Letter, May 11, 1946

● When You Opened This Page—
What Did You See First?
—then, How Did Your Eyes
Travel—and Why?

These and Many Other Questions Concerning the
Nature of Eye-behavior . . . Now Answered
Scientifically in

THE PSYCHOLOGY OF Seeing

By HERMAN F. BRANDT, Ph.D.

Director of Visual Research
Laboratories and Professor of Applied
Psychology, Drake University

Here is an original, interest-compelling work in a little-explored field, backed by 10 years of original research in ocular photography by the inventor of the famous Brandt Eye Camera.

Of unusual value to efficiency experts, physicians, optometrists, psychologists, illumination engineers, educators, artists, advertisers, journalists and all others seeking a scientific understanding of every phase of vision. The author banishes guesswork and discards outworn theories in favor of a body of solid scientific fact based upon laboratory findings. Written in easy-to-read style without burdensome technical language.

" . . . recommended to those interested in this field."

—Journal of American Medical Association

PARTIAL CONTENTS

- How Eyes in Motion
Reveal Secrets
- Measuring Eye Appeal
- Mechanics of Seeing
- Instruments for Objective
Eye Observation
- New Bidimensional
Camera
- Illusions
- Basic Eye Movements,
Laws and Tendencies
- Problems of Perception
- Visual Acuity
- Ocular Control and
Direction
- Reading Characteristics
- Evaluating Advertising
Via Photography
- Influence of Colors,
Layout, Headline
Position, etc.
- Psychological Implica-
tions of Ocular Patterns
- Art and Aesthetics as
Ocular Response
- Education and Ocular
Performance
- Statistical Formulae
and many other Re-
lated Topics

87 Illuminating Illustrations

LIMITED EDITION ORDER PROMPTLY \$3.75

At Your Bookseller or

PHILOSOPHICAL LIBRARY, Publishers
15 E. 40th St., Dept. 35, New York 16, N. Y.