NAVY DEPARTMENT, PERMANENT COMMISSION, March 31st, 1864.

SIR:—We have the honor to report that the commission has had under consideration and examination a plan of Mr. G. V. Rutheford for destroying gunboats or ships of war. The present state of naval warfare precludes the possibility of adopting this style of invention. Very respectfully, your obedient servants,

C. H. DAVIS,
Chief of the Bureau of Navigation.
A. D. BACHE,
Supt. U. S. Coast Survey.
JOSEPH HENRY,
Secretary Smithsonian Institute.

Hon. GIDEON WELLES, Sec. of Navy.

## LECTURE ON PERFUMES.

We have received from Septimus Piesse, Ph. D., F. C. S., a copy of a lecture on perfumes, delivered by him before the Royal Horticultural Society, and we select from it the following extracts:—

### THE THREE CLASSES OF PERFUMES.

Perfumes that are derived from plants may be, for the purpose of description, conveniently divided into three classes. Class I. are the most ancient, and have been in use from the earliest period of which there is record. They consist of the various odoriferous gum-resins, which exude naturally from the trees which yield them; and to increase the produce, the plants are often purposely wounded. The most important are benzoin, olibanum, myrrh and camphor. No less than 5,000 cwt. of these together are annually imported into Great Britain. Gum-resins form the chief ingredients in incense, and in pastilles. These odorous bodies are principally consumed in certain religious ceremonies, and from the early custom of burning incense upon the holy altar, our word perfume, from *per fumus* (by smoke), has been derived.

Class II. are those perfumes which are procured by distillation. This is the first step to separate the odorous principle from the material which contains it. As soon as the Greeks and the Romans learned the use of the alembic or still, which was an invention imported by them from Egypt, they quickly adapted it to the separation of the odorous principle from the numerous fragrance-bearing plants which are indigenous to Greece and Italy. An essential oil or otto thus produced from orange-flowers bears in commerce to this day the name of Neroly, supposed to be so named after the Emperor Nero. Long before that time, however, fragrant waters were in use in Arabia, as all may learn who read the Arabian Nights.

More than 200,000 pounds-weight of various ottos were imported into Britain in 1860, and valued at £180,000; to this must be added at least one-third as much again distilled in England. Of the imported articles enumerated, oils of lemon and bergamot, from the Two Sicilies, reached 128,809 pounds, valued at £57,054.

We now pass to class III. These are the purfumes proper, such as are used for perfuming handkerchiefs. It will have been observed, that hitherto I have not spoken of the fragrance from any flower, but only of those odors which are derived from either the leaves, the wood, the fruit, the root, or the seed of the plant. What we have now to say refers more particularly to the perfumes derived from flowers.

### PROCESS OF ENFLEURAGE.

Contrary to the general belief nearly all the perfumes are not made by distillation, but by the processes of enfleurage or inflowering and by maceration or infusion.

The odors of flowers do not, as a general rule, exist in them as a store or in a gland, but they are developed as an exhalation. While the flower breathes it yields fragrance, but kill the flower, and fragrance ceases. It has not been ascertained when the discovery was made of condensing, as it were, the breath of the flower during life; what we know is, that if a living flower be placed near to butter, grease, animal fat, or oil, these bodies absorb the odor given off by the blossom, and in turn themselves become fragrant. If we spread fresh unsalted batter upon the inside of two dessert plates, and then fill one of the plates with gathered fragrant blossoms of clematis, covering them over with the second greased plate, we shall find that after twenty-four hours the grease has become fragrant. The blossoms, though separated from the parent stem, do not die for some time, but live and exhale odor, which is absorbed by the fat. To remove the odor from the fat, the fat must be scraped off the plates and put into alcohol; the odor then leaves the grease and enters into the spirit, which thus becomes "scent," and the grease again becomes odorless.

The flower farmers of the Var follow precisely this method on a very large scale, with but a little practical variation, with the following flowers: rose, orange, acacia, violet, jasmin, tuberose and jonquil. The process is termed, as said before, enfleurage or inflowering. In the valley of the Var there are acres of jasmin, of tuberose, of violets, and the other flowers named; in due season the air is laden with fragrance, the flower harvest is at hand. Women and children gather the blossoms which they place in little panniers like fishermen's baskets hung over the shoulders. They are then carried to the laboratory of flowers and weighed. In the laboratory, the harvest of flowers has been anticipated. During the previous winter great quantities of grease, lard, and beef suet have been collected, melted, washed and clarified.

The great success of this process depends on the absolute purity of the grease employed and no pains are spared to this end. In each laboratory there are several thousand chassis (sashes), or framed glasses, upon which the grease to be scented is spread, and upon this grease the blossoms are sprinkled or laid. The *chasse en verre* is, in fact, a frame with a glass in it, as near as possible like a window sash, only that the frame is two inches thicker, so that when one chasse is placed on another there is a space of four inches between every two glasses, thus allowing room for blossoms. Every chasse, or sash, is about two feet long by eighteen inches broad, as here seen. The flower blossoms are changed every day, or every other day, as is convenient in regard to the general work of the laboratory or flowering of the plants. The same grease, however, remains in the chasse so long as the particular plant being used yields blossoms. Each time the fresh flowers are put on, the grease is "worked"—that is serrated with a knife—so as to offer a fresh surface of grease to absorb odor. The grease being inflowered in this way for three weeks or more—in fact, so long as the plants produce blossoms—is at last scraped off the chasse, melted, strained and poured into tin canisters, and is now fit for exportation. We have here specimens of fat thus inflowered, jasmin fat, orange fat, tuberose fat, violet fat, rose fat, etc. In every moderate-sized laboratory there are employed from two to three thousand sashes.

### PROCESS OF MACERATION.

Fat or oil is perfumed with these same flowers by the process of maceration; that is, infusion of the flowers in oil or melted fat. For this end, purified fat is melted in a *bain marie*, or warm bath, and the fresh blossoms are infused in it for several hours. Fresh flowers being procured, the spent blossoms are strained away and new flowers added repeatedly, so long as they can be procured. The *bain marie* is used in order to prevent the grease becoming too hot from exposure to the naked fire; so long as the grease is fluid, it is warm enough. Oil does not require to be warmed, but improved results are obtained when it is slightly heated. We have upon the wall here a sketch showing the water bath for melting the fat or warming the oil.

Jasmin and tuberose produce best perfumed grease by enfleurage, but rose, orange, and acacia give more satisfactory products by maceration; while violet and jonquil grease is best obtained by the joint processes—enfleurage followed by maceration.

### EXTRACTING THE ODOR FROM THE FAT.

In order now to obtain the perfume of these flowers in the form used for scenting handkerchiefs, we have to infuse the scented fat or oil, made by any of the above methods, in strong alcohol, that is rectified spirits of wine.

In extracting the odor from solid fat it has to be chopped up fine as suet is chopped, or melted, and then put into the spirit, and left to infuse for about a month. In the case of scented oil it has to be repeatedly agitated with the spirit. The result is, that the spirit extracts all the odor from the fatty body, becoming itself "perfume," while the grease again becomes odorless; thus is procured the essence of jasmin, essence of orange flowers, essence of violets, and others already named—rose, tuberose, acacia and jonquil. Several specimens are here shown.

It is remarkable that these flowers yield perfumes which, either separate or mixed in various proportions, are the types of nearly all flower odors; thus, when jasmin and orange flowers are blended, the scent produced is like sweet pea; when jasmin and tuberose are mixed the perfume is that of the hyacinth. We will practically exemplify this thus; all the various bouquets and nosegays, such as "frangipanni," "white roses," "sweet daphne," are made upon this principle.

### THE FLOWER HARVEST OF CANNES.

The commercial importance of this branch of perfumes may be indicated by the quantity of flowers annually grown in the district of Cannes. Flower harvest: orange blossoms, 1,475,000 lbs.; roses, 530,000 lbs.; jasmin, 100,000 lbs.; violets, 75,000 lbs.; acacia, 45,000 lbs.; geranium, 30,000 lbs.; tuberose, 24,000 lbs.; jonquil, 5,000 lbs. The quantity produced at Nice I have been unable to ascertain; with violets and orange there are more, but with Cassie less than here stated.

The market season for orange flowers at Nice lasts for more than a month, as an average, and during that time there are sold about fifteen to eighteen tuns of flowers daily! and a tun of flowers will yield more than a kilogramme of otto, say forty ounces, worth £20 sterling, ($100); and the residuary water, highly saturated with odor, worth another £10 ($50) note.

## The Twenty-inch Navy Gun.

We have already alluded to this gun on page 280 of the present volume. We now give some account of its trials with heavy charges. The great gun is nearly four feet shorter, but has the same bore, and is intended to possess the same relative capacity, It has been in course of completion nearly ten months, and was placed in position for trial for the first time on Thursday. It was suspended by the trunnions, breech and muzzle, the sling having been constructed for the special purpose. It was charged first with sixty pounds of powder, and subsequently two successive charges of the same amount of powder, the last accompanied by a solid shot weighing 1,080 pounds. The gun at each discharge vibrated about one-half its length in its slings.

On Friday the heavier charges were tried. Eighty pounds of the usual heavy rock powder were used, and the 1,080 pound solid shot was sent down to keep it there. Notwithstanding the great weight of the gun, the size of the charge, and the magnitude of the solid shot, the loading of the monster cannon was accompliseed in a briefer space than would require us to write the account. Three 80-pound charges were fired, and, as an old salt remarked, that they were "beautiful to hear." To a sensitive tympanum the shock of this gun is pleasant in comparison with that produced by a 9-inch Dahlgren.

A charge of 100 pounds was next introduced, the solid shot sent home, the percussion arranged, when Mr. James Knapp pulled the lanyard. The ball struck the stony bank, and tuns of rock fell into the cavern, already existing from similar ponderous blows.

This time the gun recoiled about two-thirds of its length in the sling, and the concussion scarcely differed from that experienced with the 80-pound charges. A second charge of 100 pounds was fired, and immediately after the recoil, a wrought-iron bolt, three inches in thickness, suddenly snapped, and the breech-band broke, letting the enormous mass to the ground, crushing as if they were made of timber, the T-rails beneath.

This sudden accident brought the test to a conclusion. Captain Yard, United States Navy, who superintended the test, expressed himself highly gratified with it. The gun had done its duty so far as the preliminary examination was concerned, and the accident that brought it to a termination before the final charge was fired—but one remaining to complete it—was regretted by all present.

THE striped bug, says Dr. Trimble, so destructive in melon and cucumber beds, may be effectually got rid of by cooping a hen with a brood of small chickens near the vines. The little chicks will hunt and destroy the bugs, without injury to the plants.