plex tissue fractions when present in the prepared citrus juice mixture was determined by testing out the effect of infusions of the tissues when mixed with juice pressed from juice sacs only. The causal agent responsible for the bitter taste was identified as of glucosidal origin with a regional distribution mainly in the inner peel and veins and locular walls. The degree of development of the bitter taste in prepared citrus juices on aging is apparently dependent upon fruit maturity, citrus type and variety, method of extraction and possibly after-treatment.

The causal agent for the indicated color changes was traced to the outer peel, and identified as citrus oil.

The practical application of these preliminary results is readily apparent. With an understanding of the causes responsible, measures may be taken in the preparation of the juice to reduce the bitter taste to a minimum and to mask slight traces of the bitter taste by bringing in a trace of citrus peel oil. Color changes, from the deep orange of Satsuma and tangerine to lighter shades of orange or to yellow, and the change from orange or deep yellow of sweet orange to lighter shades of orange or to yellow may be controlled. The relative stability of the mixture as a whole is also a subject which concerns the producer, since stratification within the juice mixture may not only affect the color but also the taste qualities. The complete data will be published shortly. In connection with the subject, it should be stated that other problems are under investigation, including attempts to determine the cause of undesirable taste qualities other than bitterness. These results will be reported later.

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A KNOCKDOWN "BERLESE FUNNEL"

As several persons have shown interest in a collapsible desiccation trap which I have used with considerable satisfaction for about fifteen years, I am publishing its specifications so that any one may have one made up for his own use.

The Italian acarologist used the cumbersome hot-water jacket as a heating or drying unit. A convenient laboratory substitute is the incandescent bulb. For field and travel I have used the sunshine and altered the frame so as to pack flat. In brief, the trap consists of a framework of zinc or brass strips one inch wide, cut from material one sixteenth of an inch thick. The strips are soldered together so as to make up five T-shaped pieces (uprights), and one asterisk shaped plate, as shown in Fig. 1. The T-pieces (uprights) have the cross-piece seven inches long and the leg ten inches long bent where it joins the cross-piece, as shown. The three notches are slightly wider than the thickness of the material. The asterisk plate (which functions as a leg stabilizer) has

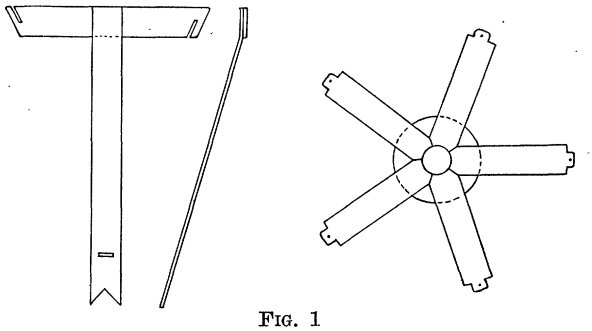

FIG. 1

a central hole (seven eighths inches in diameter for receiving vials to three quarters inches in diameter) cut into the central disc (three inches in diameter). The total length of the arms (measuring from center of the asterisk) is four and five eighths inches. The terminal tongues are a half inch broad, and designed to fit into the slot at the base of the legs. The holes in these tongues should be one sixteenth inch from base of the tongues and of the diameter of a common straight pin.

To assemble this frame, dovetail the notches of the ends of the heads of the five uprights—thus forming a pentagon. Insert the tongues of the stabilizing plate into the slots at the base of the legs, and drop pins into the holes.

The funnel is cut from a piece of stiff paper or pamphlet cover (cardboard) and pinned together along the overlapping edges. I keep two or three such funnel sheets on hand. For the above dimensions a radius of ten and a quarter inches is satisfactory, with a three-quarter inch semicircle cut out of the apex (center of base of funnel sheet). I always use a smaller funnel below the major to take up the space between the vial and the funnel in case there is a gap, as there often is.

The sieve, which is dropped into the mouth of the funnel, fits into the funnel about an inch below the rim, if eight inches in diameter. It may be made of copper mosquito netting soldered to a ring made of three-sixteenth inch wire.

Such a trap may be set up in half a minute. The moss, leaf mould or vegetable débris is spread on the sieve (a pound tin full) and the trap placed on the ledge of a hotel window, steamer deck, balcony, city roof or in the backyard to sun. If the vegetable layer is two inches deep (loose) on the sieve it is best to let it sun through the day.

To kill the catch, drop into the vial, after it has

stood quietly a minute or two, a teaspoonful of boiling water, heated over a flame of alcohol held in the lid of a small tin-can, like that of a small-sized George Washington coffee tin.

A useful adjunct in regions where sunshine is rare or not dependable is an electric light bulb, fifteen feet of flexible wire cord, and a two-way plug to screw into the hotel lighting fixture. This will enable the collector to dry out his material while he sleeps.

Needless to say much débris falls into the vial with the arthropods. It is better to sort out the specimens while they are still alive by sprinkling the contents of the vial on a white card and searching it under a small portable dissecting binocular microscope, but if this can not be done at the time, the sorting can be done years later—preserving the specimens with the débris, after the boiling water has cooled, in seventy per cent. alcohol.

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SPECIAL ARTICLES

THE ADMINISTRATION OF FERROUS IODIDE AND LINOLEIC ACID TO RATS DEPRIVED OF VITAMIN A[1]

MINUTE doses of ferrous iodide were administered daily by Chidester, Eaton and Thompson[2] to rats depleted of vitamin A, and in some cases of vitamin D as well, with the result that for a period of 14 weeks the animals gained in weight at almost the same rate as the positive controls, and were apparently cured of xerophthalmia, although a standard vitamin A-free diet was fed. Chidester, Eaton and Speicher[3] reported approximately the same findings in slightly greater detail. Chidester[4] and Chidester and Wesson[5] discussed the importance of the combinations of dietary substances with respect to iodine, iron and particularly to the unsaturated fatty acids which had just been shown by Burr and Burr[6] to be essential to life. The belief that benefits might accrue to rats deficient in vitamin A from the administration of iodine and of iron, together with essential fatty acids, was put to the test by Chidester, Eaton and Speicher,[7] who fed ferrous iodide and linoleic acid to rats deficient in vitamin A. Resumption of growth and cure of xerophthalmia were reported and interpreted to indicate mobilization of the vitamin stores in the body as well as an actual substitution for vitamin A by the ferrous iodide and linoleic acid.

Neither Mason[8] nor Cameron[9] has been able to confirm the results that Chidester and his associates secured by feeding ferrous iodide to animals depleted of vitamin A. We have likewise been unable to detect any beneficial effects as a result of the administration of ferrous iodide, linoleic acid or of ferrous iodide in combination with linoleic acid.

ANIMAL EXPERIMENTS

Male rats, weighing 38 to 50 gm at 21 days of age, were given *ad libitum* Sherman's diet No. 380. This consists of extracted casein 70 per cent., starch 20 per cent., yeast 5 per cent., salt mixture[10] 4 per cent., and sodium chloride 1 per cent.; in addition, a daily supplement of 0.001 mg of irradiated ergosterol dissolved in oil was administered. When the animals had ceased to grow and had developed severe xerophthalmia (ca. 40 days) they were divided into five groups which received, respectively, daily supplements of 0.1 cc distilled water, 1 drop of cod-liver oil + 0.1 cc distilled water, 0.1 cc ferrous iodide solution (0.1 cc contained 0.024 mg of ferrous iodide), 0.1 cc of linoleic acid, and 0.1 cc of ferrous iodide solution + 0.1 cc of linoleic acid. The supplements, with the exception of the cod-liver oil, were delivered into the mouth by syringe. The water was given to the positive and negative controls to insure the same amount of handling for all the animals. The ferrous iodide solution was made up daily just before use.

All rats were examined at death for infections of the middle ears, of the glands at the base of the tongue and of the salivary glands, as well as for renal and bladder calculi.

RESULTS

The results in Table 1 indicate the complete ineffectiveness of any of the supplements, except cod-liver oil, either for the promotion of growth or the cure of xerophthalmia. At autopsy one or more of the typical

[1] The expenses of this investigation were shared by the Connecticut Agricultural Experiment Station and the Carnegie Institution of Washington, D. C.

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[9] H. C. Cameron, SCIENCE, 76, 18. 1932.

[10] T. B. Osborne and L. B. Mendel, *Jour. Biol. Chem.*, 37, 572. 1919.