the formation of Vitamin A in the animal depends in large part upon:

(a) The rôle of the unsaturated hydrocarbon carotene and the associated fatty acids found in arachis oil in restoring the fat-iodin balance in animals, fat depleted by Vitamin A deficiency diet.

(b) Its action in restoring the desaturating power of the liver.

From a series of studies with ferrous iodide carried on since 1925 we have come to the conclusion that there are two factors in recovery from Vitamin A deficiency, one, effective in curing *xerophthalmia,* and *otitis media,* and in awakening the dormant thyroid; the other belonging to unsaturated fats and hydrocarbons, aiding to restore the iodin-fat balance and facilitating growth.

As reported at the Cleveland meetings of the American Association for the Advancement of Science (1930) we find that linoleic acid is extremely effective when combined with the ferrous iodide. Studies during the past winter and now in progress indicate that ferrous iodide and linoleic acid will act more favorably on rats, profoundly depleted of Vitamin A, than cod liver oil.

That ferrous iodide alone should prove beneficial in Vitamin A deficiency, accompanied by certain symptoms of thyroid disturbance is probably due to the iodin action on keratinized tissues and the withdrawal of stored fats from the animal. The dormant thyroids of animals that have received a fat-free diet for some time are apparently stimulated by the ferrous iodide, and the addition of unsaturated fats aids in restoring the balance. Further details regarding the experiments now in progress will be published soon, with the names of our laboratory assistants (Chidester, Bourne and Wiles).

For a long time it has been known that while Vitamin E is essential for reproduction, it is no more so than Vitamin A. Evans and Burr (1925) have stressed the fact that Vitamin E is concentrated in the seeds and embryos of certain plants as well as in egg yolk. The fact that in experimental studies that we are now carrying on, we have noted gonadal development in animals thoroughly depleted of Vitamin A and then furnished linoleic acid and extremely small quantities of ferrous iodide is, we believe, rather significant. Schmidt (1891) and also Miller (1910) and Ivanow (1912) have shown that the *iodin* numbers of the *unsaturated acids* and oils of various seeds decrease during germination. Numerous investigators have demonstrated that either an excess of iodin or an excess of fat will induce sterility in experimental animals. We contend that iodin-fat imbalance is a most fundamental one in deficiencies in fat soluble Vitamins A and E.

F. E. CHIDESTER

THE FEEDING HABITS OF THE FIRST INSTAR LARVAE OF THE CLUSTER FLY

FIRST instar larvae of the cluster fly, *Pollenia rudis* (Fab.), have been observed in the laboratory feeding upon the earthworm *Allolobophora caliginosa* (Sav.). Former records indicate only *Allolobophora chlorotica* (Sav.) and *Eisenia rosea* (Sav.) as hosts to this parasite.

Former investigators have not observed the entrance of the first instar larvae into the body of the earthworm. Keilin (1915) suggested that the larvae probably enter by means of the genital pores while the worms are in copula.

First instar larvae have now been observed by the author to enter directly through the cuticula. They have been observed in various stages of entrance, from the time when only the mouth parts were imbedded in the cuticula until only the posterior spiracles were exposed. First instar larvae apparently always feed with the spiracles exposed.

As many as five larvae have been observed feeding on one worm. They usually enter the anterior portion of the worm in the region from the tenth segment to a few segments posterior to the clitellum. All the larvae so far observed have entered the worm from the dorsal side. While the usual place of entrance seems to be the intersegmental furrows, the larvae have been observed entering through the thicker portions of a segment and also through the clitellum.

The earthworms were placed in a petri dish containing usually about thirty eggs of the dipterous parasite. The worms were introduced as the larvae began to emerge from the eggs. Parasitism usually occurred about two days later.

Mrs. Grace Pickford Hutchinson, of Osborn Zoological Laboratory, Yale University, very kindly identified the earthworms as *A. caliginosa* (Sav.).

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BRANCHINECTA COLORADENSIS IN COLORADO

IN the February 27 and September 11, 1931, issues of SCIENCE there was a discussion as to means of dispersal of the fairy shrimp, *Branchinecta coloradensis.* In the latter article it is also recorded from a hollow in a boulder at the elevation of 8,000 feet near Estes Park. In Ward and Whipple it is recorded as an alpine species. Dodds, in his "A Key to the Entomostraca of Colorado," gives its distribution as alpine, but with one record from St. Vrain at an elevation of 5,100 feet.

My own experience shows that it is not nearly so strictly alpine as has been supposed. I have collected

it from small hollows in granite outcroppings on Arthur's Rock, west of Fort Collins, and overlooking the plains, elevation about 6,800 feet; about four miles east of Allen's Park, elevation about 8,300 feet; and on Old Man Mountain, just west of Estes Park village, elevation 8,300 feet. In these little hollows it was often quite abundant, but smaller than individuals from the alpine ponds. This might well have been due to the lack of food in these temporary puddles. I have also found it in the ponds of the thick timber around the 10,000 feet levels.

I have assumed in the past that wind was a considerable factor in distribution. The eggs undergo desiccation and might then be carried by the wind. The hollows were on exposed outcrops. The winds of the winter half of the year are often quite strong, and prevailingly from the west or northwest, so that the eggs could conceivably be carried out over the middle and lower mountains, and dropped in the small hollows which are characteristic features of the rock ridges and outcrops.

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A TEMPORARY RESPITE FOR THE WHALE

THE past season's whaling operations resulted in a killing orgy, chiefly in the Antarctic, that broke all records. The world catch, of late increasing from season to season, amounted last year to 38,563 whales, which yielded more than 3,427,000 barrels of oil. The supply so far exceeded all ordinary demands that whaling vessels were laid up and much oil stored. Present-day whaling is largely a Norwegian industry, about which there is not much general knowledge in this country. Naturalists concerned about the supply of whales have been wondering what the next move of the industry, with its huge investment in specially built steamships, would be.

Information received last week from a Norwegian friend in Tonsberg, who knows what is going on, throws light on the subject:

> . . . So far as I can gather, the outlook is this: Next season only the modern vessels will go out, and that only provided they have been able to sell the oil in advance. There is still a quantity of say 500,000 barrels unsold of last season's catch. . . . Sandefjord, Tonsberg and Larvik are the New Bedford, New London and Nantucket of Norway at the present day, with Sandefjord leading. I visited that place the other day, and I must confess that the harbour was a truly magnificent sight; whale catchers in long rows, one alongside the other, and the huge factory ships completing the picture. Some 8,000 men are idle at home this year. . . .

My correspondent adds that only two fleets, those of Leith and Liverpool, comprising four factory steamers with their complete sets of whale catchers, have been sent out. Early last summer I boarded one of the big Antarctic whalers, unloading her oil —55,000 barrels—at Staten Island. She had taken 1,445 whales.

The species chiefly pursued in Antarctic waters are blue whale and finback, which did not figure in the catch of the old time whaler. His methods were less effective. Other kinds of whales, such as sperm, right, humpback and sei, are no longer abundant. These were greatly reduced in numbers during the nineteenth century. The grey whale has become a rarity and the once important bowhead does not figure in modern whaling at all.

There is a year's supply of whale oil on hand. Whaling ventures as a whole are in abeyance until next fall. It is evident that the stock of whales has greatly decreased. It would be deplorable if the last season's slaughter were repeated in 1933, and the world's most important animal-oil resource seriously damaged.

C. H. TOWNSEND

NEW YORK AQUARIUM,
FEBRUARY 13, 1932

EPIZOOTIOLOGY

THESE pages frequently serve as a hospital for sick words. May I therefore bespeak a bed for "epizootiology," whose usefulness appears to have passed and who may well be relieved by the more vigorous word "epidemiology"?

I am acquainted with some learned men who think it an outrage to apply this most valuable word to the spread of disease among animals, men to whom presumably the epidemiology of anthrax conveys a totally different idea from the epizootiology of that disease, but who may be puzzled to find any word for a spreading disease among insects. Surely the idea which is carried by the word "epidemic" centers on disease, and "the spread of disease" as a separate idea does not fundamentally concern the association of that disease with plants, men, animals, land, sea, Europe or America.

Where words are concerned the purists lose in the end; and in spite of what may be said to the contrary common use is often common sense. Valuable new words grow into definite meanings of their own and forget their origins, while bad words die. There can be little doubt that "epidemic" is growing into the recognized English word for disease spreading amongst any community.

A recent correspondent of SCIENCE writes that "the English language would be in better shape if some