

limit the pressure approximately to that of a four inch column of the fluid.

This arrangement had been in daily service for ten years. A new charge of mercury was last put in about one year ago.

During the night of November 19th a violent explosion occurred, fortunately limited to a small area at the surface of the mercury on the ammonia side of the U. The 3/16" iron of the pipe was opened out at this point over an area of about four square inches and a piece about one inch square was driven out with great force. There was no damage or evidence of high pressure elsewhere in the system.

The presence together of metallic mercury and ammonia vapor is not recorded as an explosion hazard, and the ten-year record of the installation herein involved would appear to support this implication of safety.

It would seem that a special combination of circumstances must have existed in the present instance, but a search of the literature has given no positive indication as to what these might have been. There is, however, a suggestion.

Several violently explosive compounds of mercury with nitrogen are known. Mercury fulminate is one of the more stable of these. Among the less stable are recorded certain compounds of mercuric oxide and ammonia, some of which are formed by union of the gas with the solid, but none, reputedly, at temperatures below 100° C. These compounds, however, come nearer to what might conceivably have been formed in the present instance than any others. If we assume that (1) the mercury had a layer of mercuric oxide on its inner surface and that (2) the explosive mercuri-ammonium oxides can in reality form in course of time at a temperature but slightly in excess of what we term "room" temperature, we have a good explanation of what may have happened in the case before us.

It is possible to say further only that the formation of anything more than minute traces of oxide is at least improbable here, and that, as before stated, there is no record of the combination taking place at any but much higher temperatures than could have been reached in this installation.

It remains, however, almost beyond a doubt that a mercury-nitrogen compound was responsible for the explosion; and in the absence of any definite knowledge of the necessary contributing conditions, it would seem the part of safety to class the co-presence of ammonia, in any form, and mercury as an explosion risk.

CHARLES VAN BRUNT

RESEARCH LABORATORY,
GENERAL ELECTRIC COMPANY,
SCHENECTADY, NEW YORK

OBSERVATIONS ON SCORPIONS

THE life history of one of the European scorpions, *Scorpio occitanus* Lat., has been known since Fabre published the results of his investigations in his "Souvenirs." Regarding the life history of American species of scorpions, very little has been published as far as I know. Comstock states in "The Spider Book" that the scorpion does not lay eggs, while Fabre has observed that the European species does lay eggs and that it breaks the eggs and devours the shells.

The scorpion *Centruroides vittatus* Say is fairly common in northwest Arkansas. It is most frequently found on dry hillsides, where it hides under stones and similar shelter.

A study of the life history of this species was undertaken during the summer of 1925. A number of pregnant females were collected and placed in an observation cage. The first young were seen on the morning of September 5. Later, careful watch was maintained through about twenty-four hours of the day, with the result that the actual arrival of several litters of young was observed. They were fully developed in the body of the female. Each young one was born in a very thin and transparent envelope from which it freed itself in about fifteen minutes time. If the young succeeded in freeing themselves, they were assisted by the mother in getting on her back. They molted here after three to six days, and remained on her back for from five to fifteen days.

The mating dances have been observed in the American scorpion; they correspond very closely to those observed by Fabre in the European species.

Judging by the rate of growth in scorpions kept in the laboratory and by various sizes secured in the field, our scorpion probably attains maturity in three or four years.

Scorpions are easily kept in captivity if provided with water and food. They will eat small insects such as grasshoppers and roaches, but refuse caterpillars. They will also eat raw lean beef. Young scorpions feed readily upon termites, apparently in preference to anything else.

FRANK R. SMITH

DEPARTMENT OF ENTOMOLOGY,
UNIVERSITY OF ARKANSAS

A CONFUSION OF TERMS

As shown in the discussion which follows, there is a confusion as to the meaning of the terms *dialyze*, *dialyzable* and *dialyzate*. Does the substance which passes through a semi-permeable membrane *dialyze*, and is it therefore *dialyzable*? Is the *dialyzate* the material which passes through the membrane or is it the material which remains in the dialyzer? Different authorities and usages do not agree.

All of the dictionaries consulted¹ agree that to dialyze a material means to subject it to the process commonly known as dialysis. In addition, Webster gives as one of the definitions of dialyze "to pass through a suitable membrane." Since dialyze comes from the Greek *δια*, through and *λύειν*, to loosen or to release, this latter meaning is in accord with the etymology of the word. It is also in accord with British and American usage.²

The dictionaries consulted also agree substantially that dialyzable means "capable of separation by dialysis." An adjective with this meaning is useless because it may be applied either to substances which are in "true" solution or to colloidal materials, since each may be separated from the other by dialysis. Webster, by implication only, includes in the definition of dialyzable the ability to pass through a membrane. This meaning, which is not specifically mentioned in the dictionaries cited, is the only one which is justified. It, too, is in accord with present usage² though there is some confusion.

The greatest contradiction exists in the definitions of dialyzate. Webster inconsistently defines the dialyzate as the material "which fails to pass through the membrane." Murray defines dialyzate as "that portion which remains after dialysis." The term *diffusate* is mentioned by these authorities as applied to the material which passes through a membrane, as opposed to the dialyzate which fails to pass through. In opposition to this view Funk and Wagnalls define dialysate "1. The compound that is to be dialyzed. 2. The crystallizable constituents of a drug freed from colloids by dialysis."

It is obvious that the word in order to be useful must designate either the material which passes through, or the material which remains in the dialyzer, and not both. From the standpoint of etymology it seems plain that the material which passes through the membrane dialyzes, is dialyzable and is therefore the dialyzate. Though the terms dialyzate and diffusate were formerly used in the sense indicated by Murray and Webster, the better usage should be unanimously adopted, whereby the term dialyzate is used to designate the material which passes through, rather than that which remains in the dialyzer. The material which remains in the dialyzer may be designated as the undialyzable residue. The word *diffusate* has no longer any use in this connection.

ROGER J. WILLIAMS

¹ Webster's New International Dictionary; Funk and Wagnalls' New Standard Dictionary; Murray's New English Dictionary.

² See for example Harden's "Alcoholic Fermentation," p. 57 (Longmans Green and Co.), and Mathews "Physiological Chemistry." Fourth edition, p. 393. (William Wood and Co.)

THE EDWARD CURTIS FRANKLIN FELLOWSHIP

ONE of the most distinguished and best-loved of American teachers and scholars of chemistry, Professor Edward Curtis Franklin, of Stanford University, will retire from active university service at the end of the present academic year. His students, associates and friends wish to mark this occasion by a special and enduring expression of their admiration of his achievements in chemical research and of their affection for him as teacher and friend. To this end they propose to establish an ever-living memorial to him in the form of a modestly endowed research fellowship in chemistry at Stanford University. A committee of about thirty well-known chemists and a few other friends, with Dr. Ira Remsen as honorary chairman, has been formed to collect a fund of \$15,000 for this purpose. This committee is now appealing for contributions to this fund, and hopes to find general approval and support of its plan.

Franklin's career as a devoted and brilliant investigator and an inspiring teacher is well known to American chemists. He was graduated from the University of Kansas in 1888; was a student in the University of Berlin in 1890-1891; and completed his work for the doctorate under Remsen at Johns Hopkins in 1894. He began his professional work as assistant in the University of Kansas, becoming professor in 1899. He continued in this position until 1903, when he went to Stanford as associate professor. He became full professor there in 1906 and has held this position ever since.

In 1911-1913 he was chief of the division of chemistry of the U. S. Public Health Service, on leave of absence from Stanford. During the war years, 1917-1918, he was a member of the Advisory Board of the U. S. Bureau of Mines, physical chemist of the U. S. Bureau of Standards, and consulting chemist of the Ordnance Bureau of the Army. He received the honorary degree of Sc.D. from Northwestern University in 1923 and from Western Reserve in 1926. He is a member of the National Academy of Sciences and the American Philosophical Society, and was president of the American Chemical Society in 1923. In 1925 he was awarded the Nichols medal.

We provide memorials of many kinds to many men for many forms of public service. But we all too rarely express in concrete form the appreciation of our debt to such men as Franklin. The quiet, persistent and utterly devoted work of research in pure science carried on by these men is too usually overlooked by the nation and its contribution to the pub-