length of the survival time in a limited volume of air. These animals do not struggle or move about to any extent so that the metabolic factor did not influence the survival time to any great degree in these experiments.

At temperatures of 23° to 26° C., specimens of the average weight of those used above will survive in a liter bottle for ten days or more before the point of suffocation is reached. At 35° C. the point of suffocation is reached in two or three days in bottles of similar size. When the temperature is down to about 10° C. with the animals in hibernation, it has been found that those of the average size, as considered above, will live for about two months in a liter chamber of air.

These experiments, which are only a part of more extensive ones, give a rather definite idea of the lethal point for suffocation in oxygen percentages and carbon dioxide percentages for this animal, as well as reviewing the factors influencing the survival time. This is a preliminary report.

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GRADUAL OBLITERATION OF THE PORTAL VEIN AS A SUBSTITUTE FOR ECK-FISTULA[1]

THE diversion of the portal blood directly into the vena cava was accomplished by N. V. Eck[2] in 1877 by means of the fistula which bears his name. This procedure has been exceedingly useful in the study of many problems concerned with the physiology of the liver and organs whose venous blood drains into the portal system. Its application has been somewhat limited by the technical difficulties of the operation, particularly for those not trained in blood vessel surgery. During the past three years the author and associates, J. C. Ellis and W. B. Mathews, have made use of a more simple method for accomplishing the same purpose. It consists essentially in producing so gradual an obstruction to the portal vein that the collateral anastomoses in the esophagus and rectum develop sufficiently to prevent gangrene of the intestines. This may be accomplished by means of a two-stage operation in the dog, cat, goat, rabbit and rat. At the first operation, the portal vein is carefully isolated and two strong linen threads introduced around it above the entrance of the pancreatic-duodenal branch. One of these threads is then tied sufficiently to produce a constriction of the portal vein to about one half of its normal diameter. A slight congestion of the intestines may occur which rapidly disappears. The ends of the second thread are then fastened to the abdominal wall so they may be readily found at the second operation. The second operation may be done two to three weeks later, at which time the portal vein is completely occluded. Gangrene of the intestines does not occur. The operation is very simple and there is practically no mortality. A demonstration was made of this method at the meeting of the American Physiological Society in Chicago in April, 1930. It is altogether probable that many others have used this or a similar method before. I have been prompted to publish this note because of the many requests received during the past year for details of the method. We have used it successfully on the various laboratory animals listed above.

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[1] From the Department of Surgery of the University of Chicago.

[2] N. V. Eck, *Militar-medicinisches Journal*, 1877, cxxx, Jahrgang 55. Travaux de la Soc. des Naturalists de St. Petersburg, 1879, x. 55.

DEVIL'S SHOE-STRING AS AN INSECTICIDE[1]

THE investigator's attention was attracted to the possibilities of devil's shoe-string, *Cracca virginiana* Linn., as an insecticide three years ago through studies of derris, and particularly through the physiological action of derris on fish. The roots of both plants are powerful fish-poisons and, from all accounts, affect fish in a similar way. No references in literature have been found where this species has ever been used for insecticidal purposes; however, studies have been made by several investigators of foreign species of this genus. The most important studies were made by F. Tattersfield, C. T. Gimingham and H. M. Morris.[2]

Roots were dug from several localities at various times of the year and were dried by different methods. They were then finely ground in an herb mill. Careful and repeated experiments with aqueous suspensions were made under laboratory conditions on the cotton or melon aphis, *Aphis gossypii*. Marked variations in toxicity were found, due to the season, soil, method of drying and probably various other factors. The most toxic samples were obtained from sandy soil, dug in the hottest part of the year and dried in the sun. Drying in the shade, boiling in water and heating the roots caused a loss in toxicity. Comparative data with nicotine sulphate (40 per cent.), and aqueous suspensions of derris and a commercial brand of pyrethrum showed that the best samples of devil's shoe-string were slightly more toxic than pyrethrum, but were less toxic than derris; however, they compared more favorably with derris than derris with nicotine sulphate (40 per cent.).

[1] Contribution No. 24, Department of Entomology, Texas A. and M. College, College Station, Texas.

[2] "Studies on Contact Insecticides," Parts 1 and 2, Vol. 12, and Part 4, Vol. 13, Annals of Applied Biology.