ditions in the burrows of *K. minor, R. hesperus* and *Z. angusticollis* are favorable to the growth of fungi and that fungi are present in the walls of the burrows and in the fecal pellets. Termites enlarge their burrows; they eat their fecal pellets. Fungi would seem, then, to be a common element in the diet of the termites. Further investigation, however, will be necessary to determine the significance of fungi as food for termites. Fungi may cause chemical changes in wood. Hence, the question whether their presence may render wood more available or more attractive to the termites also becomes a problem of interest.

A more detailed account of this investigation will appear later.

ESTHER C. HENDEE

ZOOLOGICAL LABORATORY
UNIVERSITY OF CALIFORNIA

ANTIPROTHROMBIN AND GLOBULINS

IN a recent note[1] A. Fischer called attention to his work on the effect of the addition of heparin upon precipitation of proteins, especially of blood proteins, in an acetate-acetic acid solution at pH 5.0. With small additions of heparin there is an increased precipitation of casein, blood serum protein, or a precipitation of serum albumin. With increased amounts of heparin, precipitation may be inhibited or the precipitate dissolved. The addition of heparin to dialyzed serum albumin gives a flocculation at pH 5.0. These conclusions are similar to those previously published by Fischer in the *Biochemische Zeitschrift*.[2] Fischer concludes from his experiment that euglobulin is formed from serum albumin and suggests that euglobulin is formed in the liver through the combination of serum albumin with heparin.

We were interested in these findings of Fischer in connection with the blood of new-born animals. The serum or plasma of such animals does not contain euglobulin according to the ordinary methods of detecting it, and in some animals practically no pseudoglobulin I (if one wishes to recognize two pseudoglobulins). If euglobulin is formed by combination of heparin with albumin, it seemed possible that the failure to find euglobulin might in some way be connected with the concentration of heparin in the newborn blood. Furthermore, if euglobulin is formed by a combination of heparin with albumin, such a serum offers an excellent opportunity to test the fact. It is better than a purified serum albumin, because changes in the character of the protein through the removal of euglobulin and the purification of the albumin likely to occur in any purification process would be reduced to a minimum. The only change involved is the clotting of the fibrinogen.

Heparin preparations, both purified and crude, were presented to us by Hynson, Westcott and Dunning. The addition of heparin to new-born serum or to adult serum with an acetate buffer mixture according to the procedure of Fischer confirmed his results with regard to precipitation at pH 5.0, *i.e.,* a turbidity developed with the new-born serum where no precipitate had formed without heparin and a turbidity appeared with adult serum greater than that obtained without heparin. Furthermore, the pH for maximum precipitation was found to be different for the cow and horse. Additional amounts of heparin after the maximum turbidity was reached resulted in a decreased turbidity. However, the addition of a neutral salt or mixture of salts which precipitate euglobulin, such as 1.00 volume-molar sodium sulfate solution or of 1.425 volume-molar solution of potassium phosphate at approximately pH 7[3] to untreated new-born serum and to new-born serum to which heparin had been added failed to give a precipitation. The concentration of heparin used was that which gave the maximum turbidity at pH 5.0. Furthermore, the addition of 1.50 volume-molar sodium sulfate solution or of 2.025 volume-molar potassium phosphate at approximately pH 7, which precipitate both euglobulin and pseudoglobulin, gave equal precipitations with new-born serum in the presence or absence of heparin.

After these observations were completed a communication by Fischer and Schmitz[4] appeared in which they indicate that ammonium sulfate turbidity curves are not affected by heparin. These authors also state that the addition of herparin to serum and plasma from the same animal causes a difference in the distribution of albumin and globulin of plasma such that the albumin fraction of the plasma is decreased, while the globulin fraction is increased as compared to the corresponding fraction from serum. We have fractioned the new-born serum and plasma from the same animal, with and without the addition of heparin, at 0.75 molar and at 1.50 molar sodium sulfate. These concentrations are held to precipitate fibrinogen and total globulin, respectively, at dilutions of 1:30. (No precipitate was obtained in the serum with 1.00 molar sodium sulfate, indicating an absence of euglobulin and fibrinogen.) Heparin was added in the concentration which gave the maximum turbidity at pH 5.0, in turbidity measurements such as Fischer has used, *i.e.,* 0.5 cc of a 1 per cent. solution of heparin was added to 0.5 cc of serum for each determination. No differences were obtained in the quantity of protein precipitated in serum or plasma in any concentration of salt.

[1] SCIENCE, 75: 443, 1932.
[2] A. Fischer, *Biochem. Z.,* 244: 464–485, 1932.
[3] Paul E. Howe, *Physiol. Rev.,* 5: 439–476, 1925.
[4] A. Fischer and A. Schmitz, *Naturwissenschaften,* 20: 471–2, 1932.

These results, while confirming Fischer's observations that heparin produces a combination in serum that is precipitated at approximately pH 5.0, does not substantiate his tentative conclusion that this combination is euglobulin or pseudoglobulin. Fischer's proofs of euglobulin have chiefly concerned procedures which depend upon precipitation at the isoelectric point; a sodium acetate buffer mixture, CO_2, dialysis. Precipitation near its isoelectric point is a characteristic of euglobulin; on the other hand, euglobulin, as it is ordinarily recognized, may be salted out with neutral salts. If the heparin-protein complex of new-born serum is euglobulin, it should have been precipitated at 1.00 molar sodium sulfate, or if only a partial combination the salting out might possibly have appeared at 1.50 volume-molar sodium sulfate. We realize that salting out is not an entire proof of a globulin. Salting out does, however, comprise one of the procedures used in differentiating and preparing euglobulin. Fischer's suggestion is exceedingly interesting, but its verification requires more evidence than isoelectric precipitation. It seems to us that this phenomenon observed by Fischer can be explained without assuming the actual formation of globulin.

IMOGENE P. EARLE
PAUL E. HOWE

BUREAU OF ANIMAL INDUSTRY
U. S. DEPARTMENT OF AGRICULTURE

THE RELATION OF THE HYPOPHYSIS TO EXPERIMENTAL DIABETES

IT has been known since 1889 that removal of the pancreas leads to an increase in the blood sugar and appearance of sugar in the urine. Insulin, prepared from the pancreas, is effective in controlling the metabolism of sugar but does not cure the condition. Recently Houssay reported that extirpation of the hypophysis prior to removal of the pancreas was effective in preventing severe diabetes. It appears that we have confirmed this work. Two dogs did not survive long after the second operation, but in them the typical hyperglycemia did not develop. A third animal has survived over three weeks, during which time he has remained in good health. The tolerance for glucose is normal and the fasting blood sugar is within the normal range. No spontaneous glycosuria has occurred.

The animal shows certain symptoms which indicate complete removal of the hypophysis. Autopsy will show whether or not the hypophysectomy was complete and if there is accessory pancreatic tissue. This work is being continued at the University of Chicago.

J. F. REGAN
B. O. BARNES

PHYSIOLOGICAL LABORATORY
UNIVERSITY OF CHICAGO

CANCER RESEARCH

IN the January, 1933, number of *The American Journal of Cancer* is an editorial on cancer research. In this the editor states that the prime needs of cancer research are first, *brains;* second, *time;* and third, *money.*

I should like to point out the obvious fallacy of any generalization of this type, even though it be made by one who for years has been connected with an institution utilizing each of the three components mentioned. In a field as complex as that of cancer research one institution may need primarily brains, another time for investigation and a third money. Furthermore, the primary need of any one institution engaged in cancer research may change from month to month or from year to year. It is also obviously true that no one component alone will result in progress. Brains without time or money result merely in theories. Time alone is obviously sterile. Money without brains or time is a material and impersonal factor. If each scientific man would avoid the field of generalization about the work of all others and would apply himself to his own problems in the way that he believes best, utilizing, in the proportions which he is able to find them and is able to develop them, the three elements of brains, time and money, more progress will result.

C. C. LITTLE

ROSCOE B. JACKSON MEMORIAL LABORATORY
BAR HARBOR, MAINE

REPORTS

APPROPRIATIONS FOR GRANTS IN AID BY THE NATIONAL RESEARCH COUNCIL

THE National Research Council wishes to announce that the research aid fund of which it has had charge for the past three years is to be continued during the present calendar year, 1933. The fund is administered by a special committee on grants in aid of research, which is composed of the chairman and treasurer of the council and of the chairmen of the council's seven divisions of science and technology. This committee will be ready to consider requests for grants of moderate amount from this fund for the support of the individual research work of qualified investigators in the fields of the natural sciences, who are citizens of the United States or of Canada.

Requests for grants from this fund will be acted