

This study of ventilatory function serves to distinguish three categories of cardiacs. The first have grossly abnormal ventilatory function per unit of oxygen consumption and are breathless on exercise; the second have normal ventilatory function but complain of breathlessness (the "cardiac neurotics" probably fall into this group); and the final group are not limited by ventilatory function but maximum effort is probably set by cardio-vascular factors [Wyndham and Ward, unpublished data].

We are indebted to Dr. B. van Lingen and Dr. M. MacGregor for cardiac cases and for stimulating discussions.

REFERENCES

- ASTRAND, P. O. (1952). *Experimental Studies of Physical Working Capacity in Relation to Sex and Age*. Munksgaard (Copenhagen).
MULLER, E. A., MICHAELIS, H. and MULLER, A. (1952). *Arbeitsphysiologie*, 12, 2.

CREATINE EXCRETION IN DIABETES MELLITUS, by W. M. Politzer and T. Schneider (*The South African Institute for Medical Research and General Hospital, Johannesburg*).

Seventy-four adult European patients (50 females and 24 males) attending the Diabetic Clinic of the Johannesburg General Hospital of whom 39 (29 females and 10 males) had Dupuytren's contracture and a control group of 50 patients not suffering from any condition known to affect creatine metabolism were investigated. The total creatine was determined by the method of Peters and Van Slyke on 24-hour specimens of urine collected from each patient.

This study showed a significant increase of creatine excretion in the diabetic groups, including those with Dupuytren's contracture. There was no significant difference between the creatinuria in the female total diabetic group and in those with diabetes plus Dupuytren's contracture, but there was a marked difference between the males of the two groups.

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THE INACTIVATION OF POLIOVIRUS BY ULTRAVIOLET LIGHT, by J. W. F. Hampton (*Laboratories of the Poliomyelitis Research Foundation, Johannesburg*).

A STAIN FOR MITOTIC FIGURES, by J. T. Irving (*Department of Oral Pathology, University of Illinois College of Dentistry, Chicago, and the Joint Dental Research Unit of the C.S.I.R. and the University of the Witwatersrand, Johannesburg*).

While using the Baker (1946) histochemical stain for lipin, it was found that the pyridine modification acted as a strong stain for mitotic figures and virtually nothing else was stained save red blood corpuscles and keratin.

The unmodified Baker method consists of fixation in formalin-Ca solution, and postchroming; then after sectioning, the tissues are overstained in an acid haematein solution and differentiated in borax-ferricyanide. Lipins and certain proteins are stained blue or blue-black.

To distinguish between lipins and other stainable substances, another piece of tissue is fixed in "weak" Bouin's solution and extracted with pyridine. It is then

postchromed and stained with acid haematein as above. After this, all lipins are removed, but certain proteins, such as keratin and those in red blood corpuscles, remain stained.

It was noted, working with epithelia of the tongue and oral cavity, that mitotic figures stained very intensely dark blue or black against a yellow background after pyridine extraction. Of the inactive cells, the nuclei were unstained except for the nucleoli. Baker comments that after pyridine extraction, acidic proteins and especially nucleoproteins give a strongly positive reaction, but he does not seem to have remarked on the prominent staining of mitoses. Preliminary work indicates that metaphase, anaphase and telophase figures are equally markedly stained. If gelatin embedding is employed, the best staining times (at 37° C) are 17 hours in acid haematein solution, followed by 24 hours in borax-ferricyanide.

REFERENCE

BAKER, J. R. (1946). *Quart. J. micr. Sci.*, 87, 441.

THE EFFECT OF FASTING NORMAL SERUM ON HEPARIN-INDUCED CLEARING REACTION,
by G. S. Getz and B. M. Bloomberg (Department of Pathology and Microbiology,
University of the Witwatersrand, Johannesburg).

Heparin stimulates the liberation into the blood stream of a tissue lipoprotein lipase ("clearing-factor"), acting on neutral fat bound to a suitable lipoprotein, mainly α_2 , liberating fatty acid and glycerol [Anfinsen, 1954; Korn, 1955]. The fatty acid is bound to a fatty acid acceptor, probably albumin. Another unknown serum co-factor is also necessary. The relative physiological significance of lipoproteins and albumin as fatty acid acceptors is subject to further study.

This communication reports some effects of fasting normal serum, which was used as a source of blood co-factors in the reaction. Serum samples were collected from fasting (12 hours) normal medical students before (FS), and 15 minutes after, an intravenous injection of 5,000 units of heparin (HS). The clearing reaction was measured by a change in optical density of an emulsion of coconut oil ("Ediol") buffered at pH 7.2.

Using this system, it was found that the addition of FS often produced a lower initial clearing activity than that produced by HS alone. This effect could be predictably reproduced by (a) addition of FS in any quantity 2-3 minutes or more before addition of HS to the reaction tube, and (b) simultaneous addition of larger quantities of FS to the usual quantity of HS.

This effect of FS could seldom be produced by its addition more than 3 minutes after the start of the clearing reaction except with the addition of relatively large amounts of FS. However, the reaction tubes containing FS always showed an ultimately greater degree of clearing than that with HS alone. The initial effect of FS could not be reproduced with purified albumin. The addition of FS after the rate of reaction had diminished, produced only an acceleration and no initial retardation. This effect could be reproduced by addition of purified albumin.

Although Korn [1955] has shown in a somewhat different clearing system, that preliminary formation of a lipoprotein-coconut oil complex increases the rate of clearing, our results suggest that the nature of the serum lipoproteins themselves is