INTRODUCTION
The precise diagnosis of iron deficiency anaemia, which is the commonest type of anaemia in our country, poses many problems. Several varieties of non-iron deficient hypochromic anaemias such as thalassaemia (Wintrube, M.M., 1967), the anaemia of chronic disease (Cartwright, G.E., 1966) and sideroblastic anaemia (Mollin and Hoffbrand, 1968) are often difficult to differentiate morphologically from iron deficiency anaemia. Although the estimation of serum iron, serum unsaturated iron binding capacity and plasma transferrin saturation are of considerable help, assessment of storage iron is the most dependable investigation for the diagnosis of iron deficiency in this regard. Bainton and Finch (1964) concluded that the estimation of storage iron is the single most important investigation in the diagnosis of iron deficiency anaemia; both as a diagnostic aid and as an index to the effectiveness of iron therapy. For this its superiority over other laboratory procedures has been clearly established (Pratt and Johnsson, 1954; Beutler, Robson, Satten-Weiser, 1958; Ellis, Tansen and Westerman, 1964).

It is therefore, necessary to investigate for the status of iron
stores, in each patient, suspected to be suffering from iron deficiency anaemia.

Several methods are available for the assessment of iron stores in man. Histochemical studies of bone marrow smears and liver biopsy specimens, chemical estimation of liver biopsy and bone marrow aspirates (Weinfield, A., 1964), estimations based on quantitative assessment of sideruria induced by parenteral administration of iron chelating agents (Kerman, S., 1960 and Hallberg, and Hedenberg, 1964), are some of these. More recently estimation of chelatable iron stores by combined radio-isotopic dilution and chelation (Fielding, and Singh, 1968) have also been advocated but each of these techniques is imbued with different problems.

The histochemical methods provide at best a semiquantitative assessment. Chemical methods are too elaborate and time consuming. The estimation by chelation and radio-isotopic chelation methods distinguish iron excess more readily than iron deficiency, because the values indicative of iron deficiency show considerable overlap with the normal range (Balcerzak, Westerman, Heidne and Taylor, 1968). Moreover, these methods are not only, outside the scope of routine diagnostic laboratories, but are sometimes
in substantial error (Balcerzak, Westerman, Heinle and Taylor, 1968). This is demonstrated by the effect of \( R_{12} \) therapy on the desferrioxamine provoked sideruria of the patients suffering from pernicious anaemia. In the brief time between administration of \( R_{12} \) and measurement of urinary iron excretion the quantity of iron stores could not have changed in these subjects, and yet iron excretion decreases markedly. These changes are significantly greater than the difference in replicate D.F.O. test in the same subject, such inappropriate responses to chelation and radioisotopic methods suggest that the degree of sideruria is affected by several variables other than the size of iron stores (Balcerzak, Westerman, Heinle and Taylor, 1968).

Until all these factors are identified the results obtained by these methods must be interpreted with caution. Measurement of iron stores by phlebotomy probably is the most exact method (Balcerzak, Westerman, Heinle and Taylor, 1968), (because it is not subject to sampling error, it measures all sites and forms of storage iron, and it readily permits quantification). It, however, is the most inconvenient and an obviously impracticable method for routine and diagnostic work.
Out of all the methods, the histochemical methods which are simpler and easier to perform, present a compromise between exactitude and simplicity. These methods are the most widely used techniques and are the methods of choice for routine diagnostic laboratories. Nevertheless it remains that the histochemical methods as already pointed out provide, at best, only an indirect and roughly semi-quantitative estimate of storage iron.

It is not known as to how much iron should be present in the storage forms before it becomes stainable in the bone marrow and the other reticulo-endothelial tissues. In the present study an attempt is made to gain some insight into this aspect of the problem, by providing some understanding of the amount of iron which determines its stainability in the bone marrow smears.

If a known quantity of iron is administered parenterally to a patient with completely depleted iron stores (a patient with iron deficiency anaemia with marrow iron = grade 0) until it becomes stainable in the bone marrow smears, it shall be possible to calculate with reasonable accuracy the amount of injected iron which would have reached
the stores at that time. By implication it shall be possible to speculate about the minimum content of iron in the stores when the storage sites show positive staining for iron by histochemical techniques.

The objective of the present study, therefore is to assess the minimum amount of iron in stores, which is detectable by the presence of stainable iron in the bone marrow smears in man. It is hoped that the results of the present study would add better precision into the significance of histochemical method of the estimation of storage iron which, hitherto, is an entirely semiquantitative technique.