1. Non-nucleated circular biconcave disc shape.
2. They change shape remarkably as the cells pass through the blood vessels.

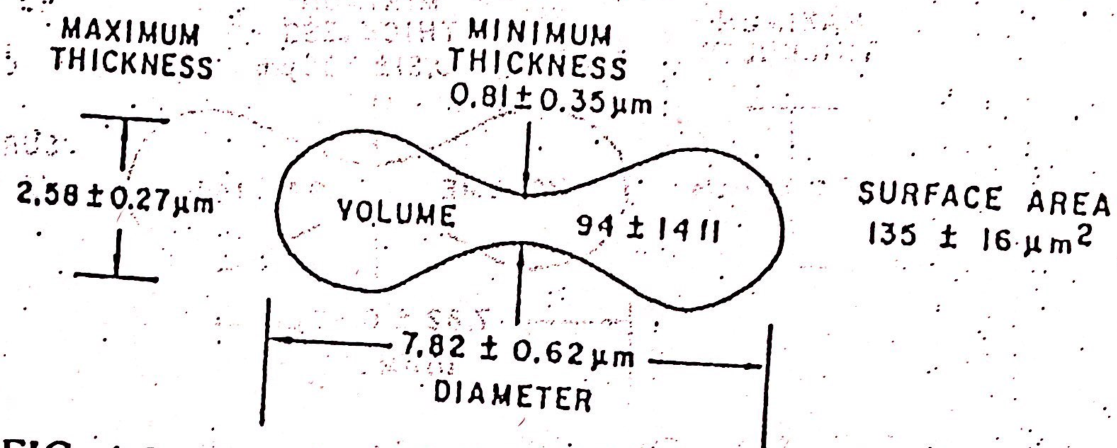

FIG. 4-3. Dimensions of a cross section of the erythrocyte in isotonic solution. Values are means ± one standard deviation.[20]

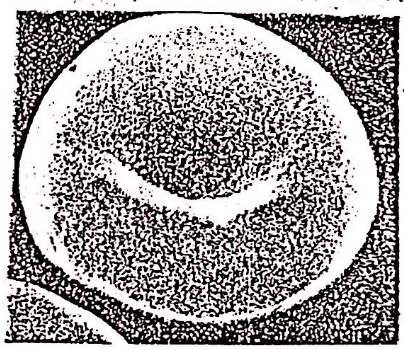

Table 3.3.
Approximate Concentrations and Daily Production Rates of Peripheral Blood Cells

Cell Type	Mean Concentration, per microliter	Daily Production Rate, per kg body weight
Erythrocytes		
Males	5.4×10^6 ($4.7–6.1 \times 10^6$)	3.0×10^9
Females	4.8×10^6 ($4.2–5.4 \times 10^6$)	
White blood cells		
Granulocytes	4500 (2600–7000)	1.6×10^9
Monocytes	300	1.7×10^8[a]
Eosinophils	150	Variable
Basophils	40	Unknown
Lymphocytes	2500 (1500–4000)	Unknown
Platelets	2.5×10^5 ($1.5–4.0 \times 10^5$)	2.8×10^9

Values in parentheses are ranges. [a]Based upon assuming production rate equals blood turnover rate and using an intravascular half-disappearance time of 8.4 h.

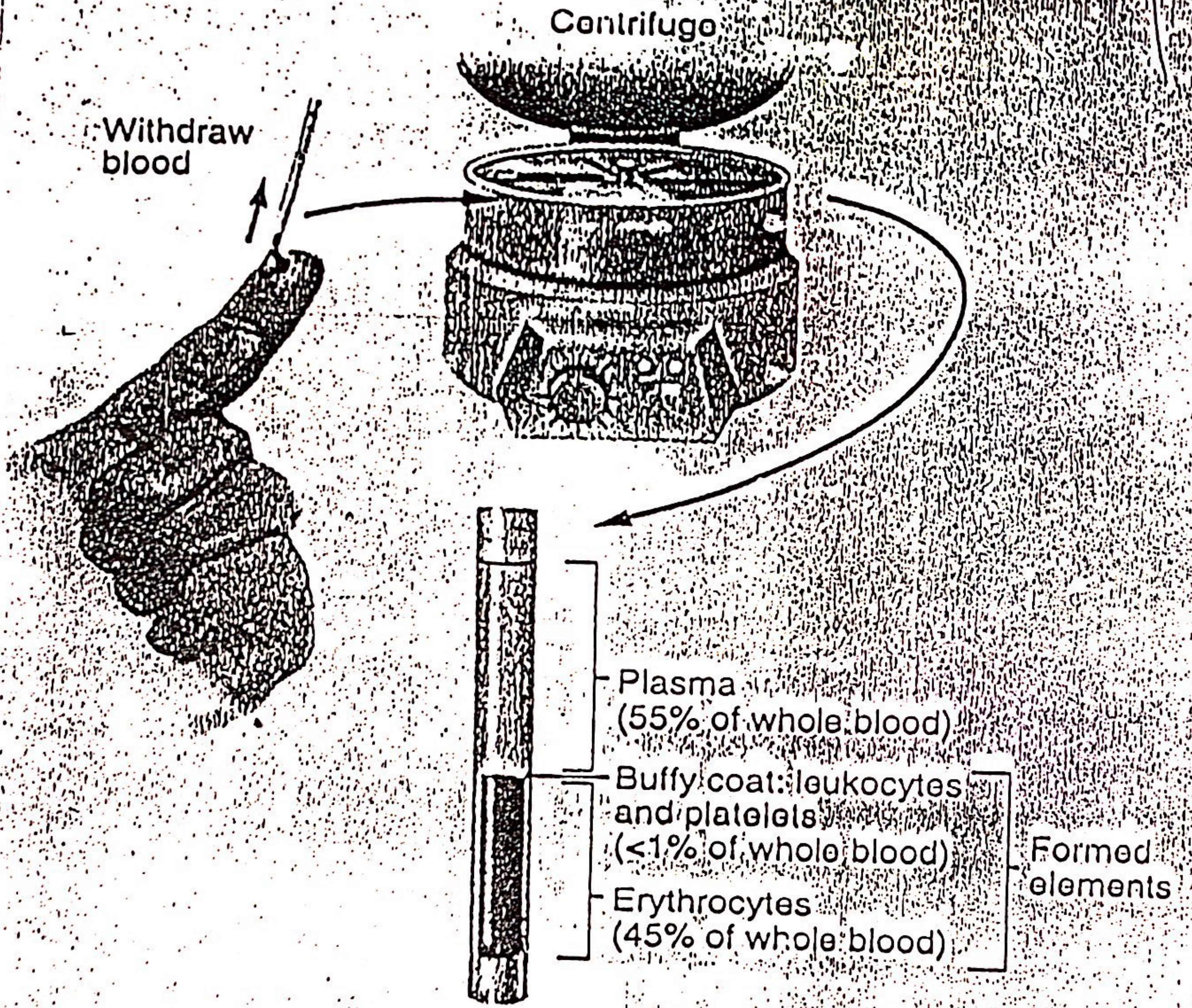

Figure 18.2 The Hematocrit. A small sample of blood is taken in a glass tube and spun in a centrifuge to separate the cells from the plasma. The percent volume of red cells (hematocrit) is then measured. In this example, the hematocrit is 45%.

HcT
or
Packed cell volume
PCV

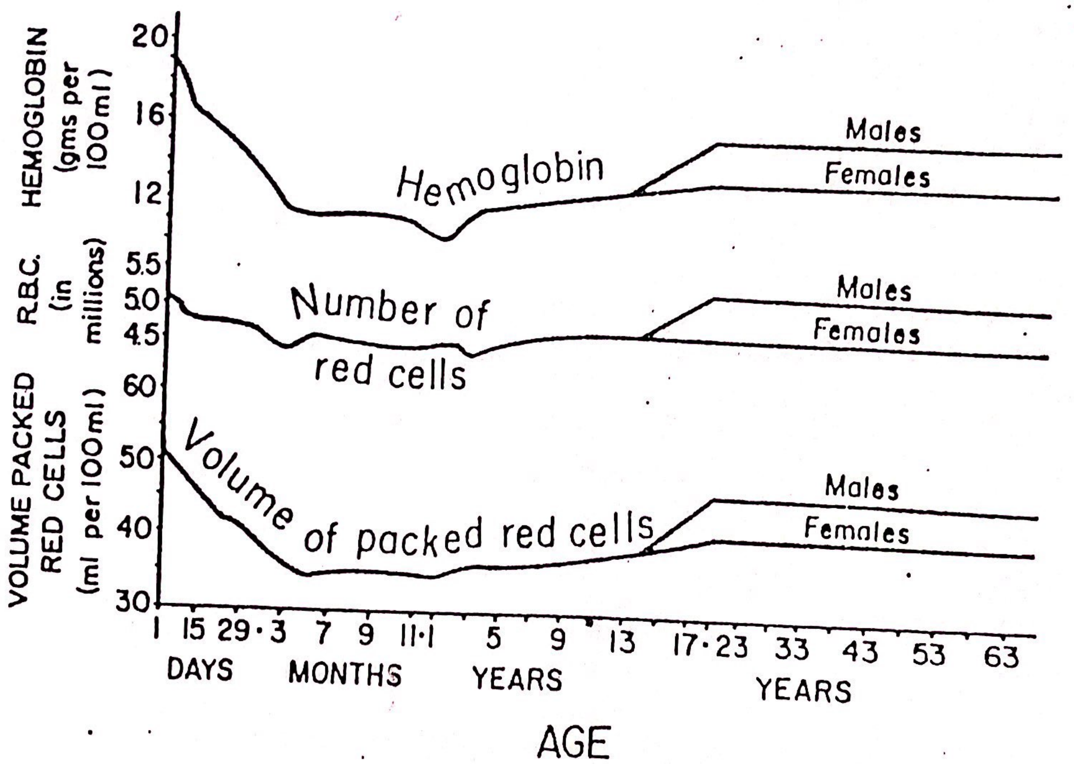

Figure 4–1. Relationship of age and sex to the hemoglobin content, red blood cell count, and hematocrit of the blood.

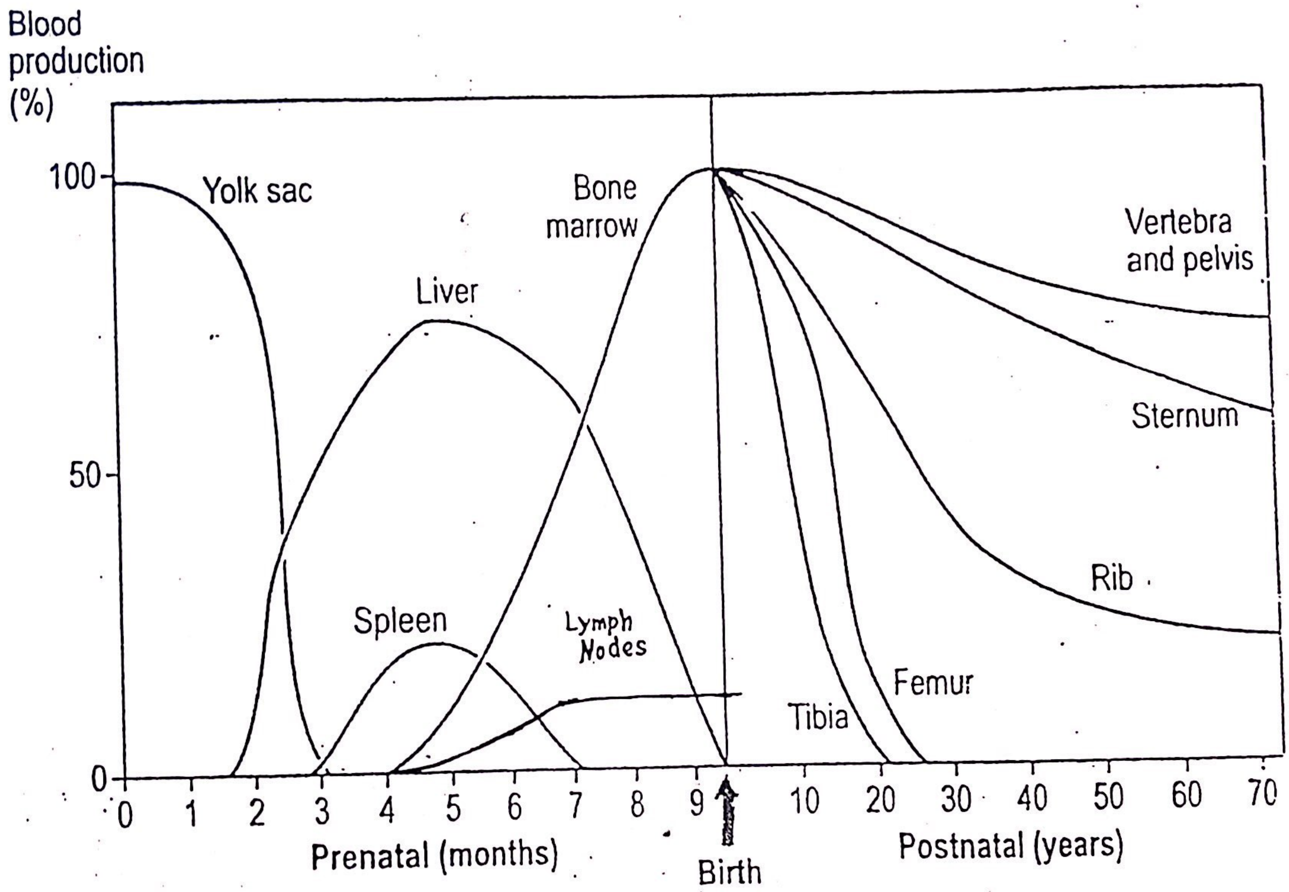

Fig. 1 Sites of blood production in the fetus and after birth. (Erythropoiesis)

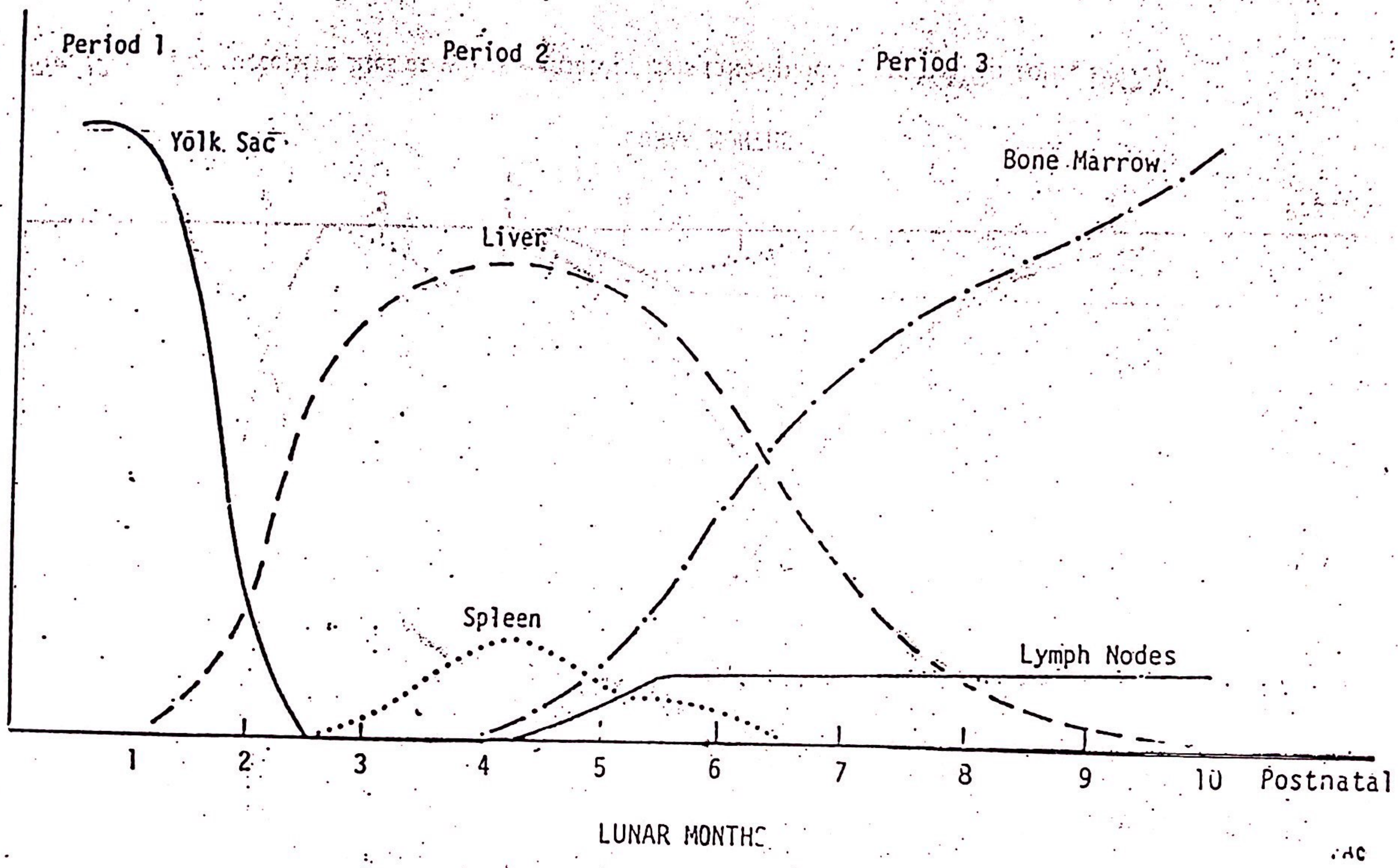

Fig. 17-3. The successive sites at which hematopoiesis takes place. (From Wintrobe, 1967.)

Foetus 0–2 months—yolk sac

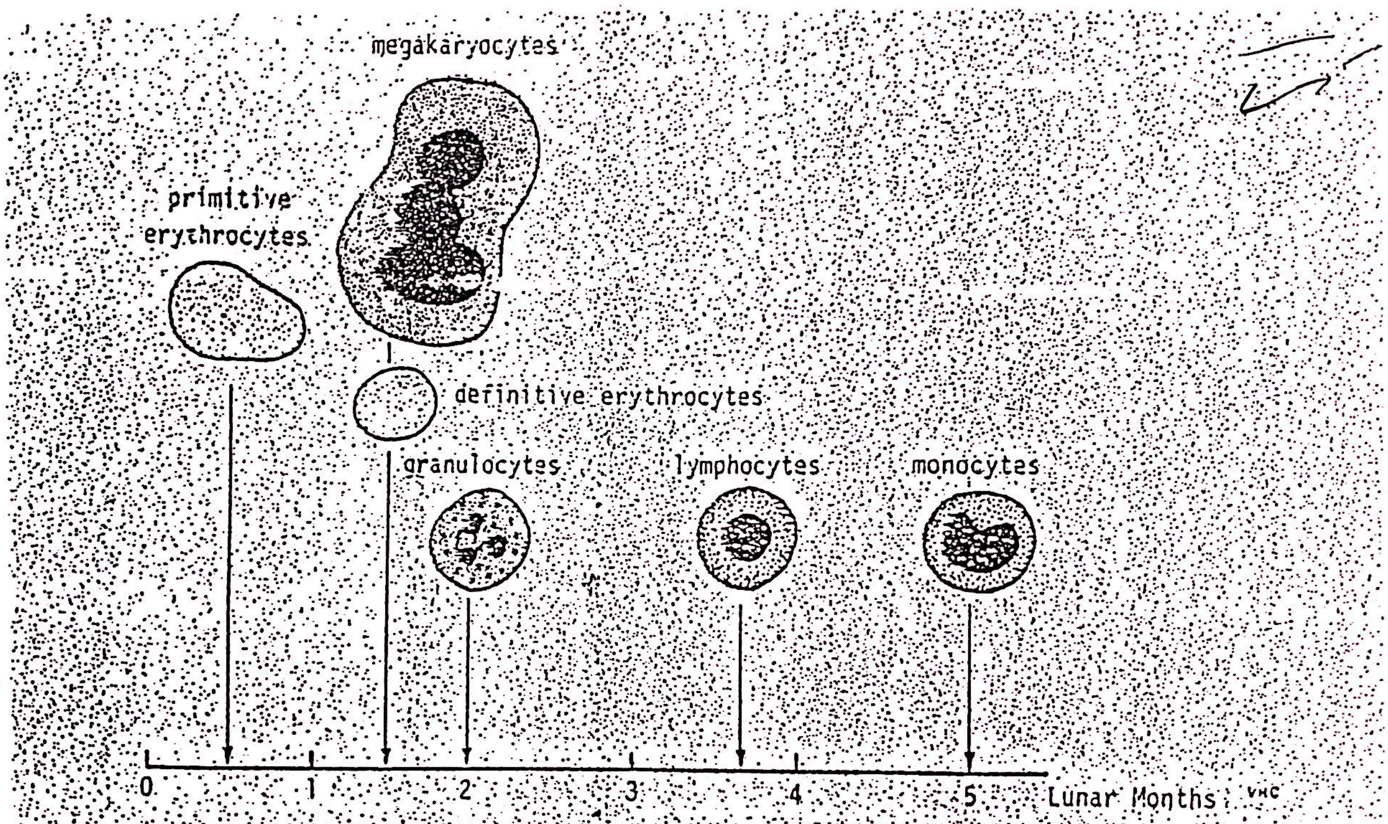

Fig. 17-6. The successive appearance of the different forms of blood cells.

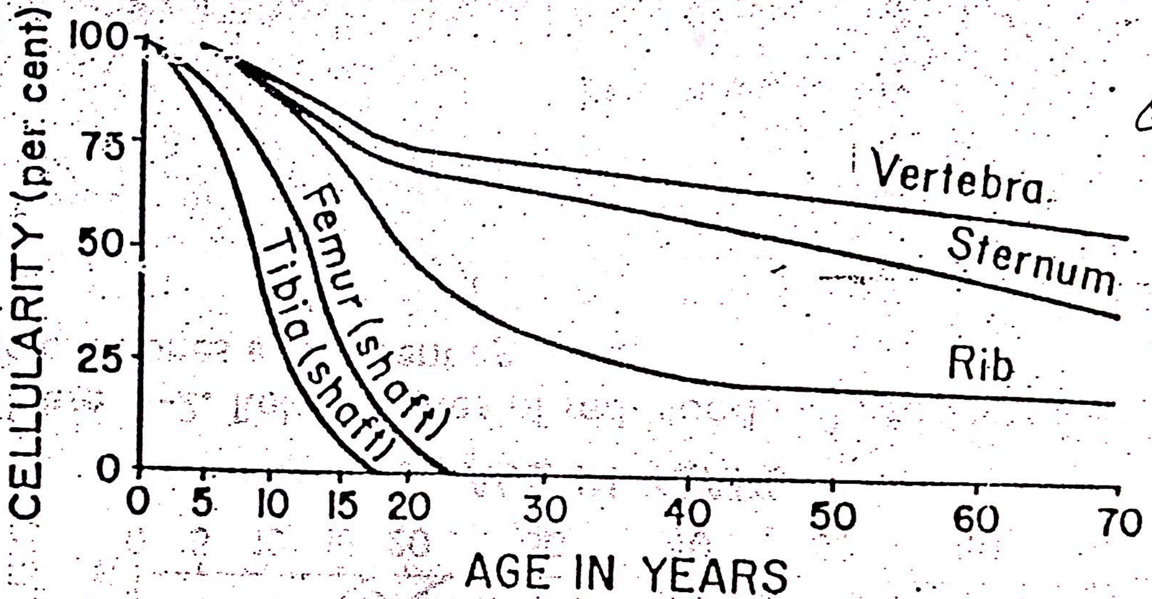

Figure 4–2. Relative rates of red blood cell production in the different bones at different ages.

Infants	Bone marrow (practically all bones)
Adults	Vertebrae, ribs, sternum, skull, sacrum and pelvis, proximal ends of femur

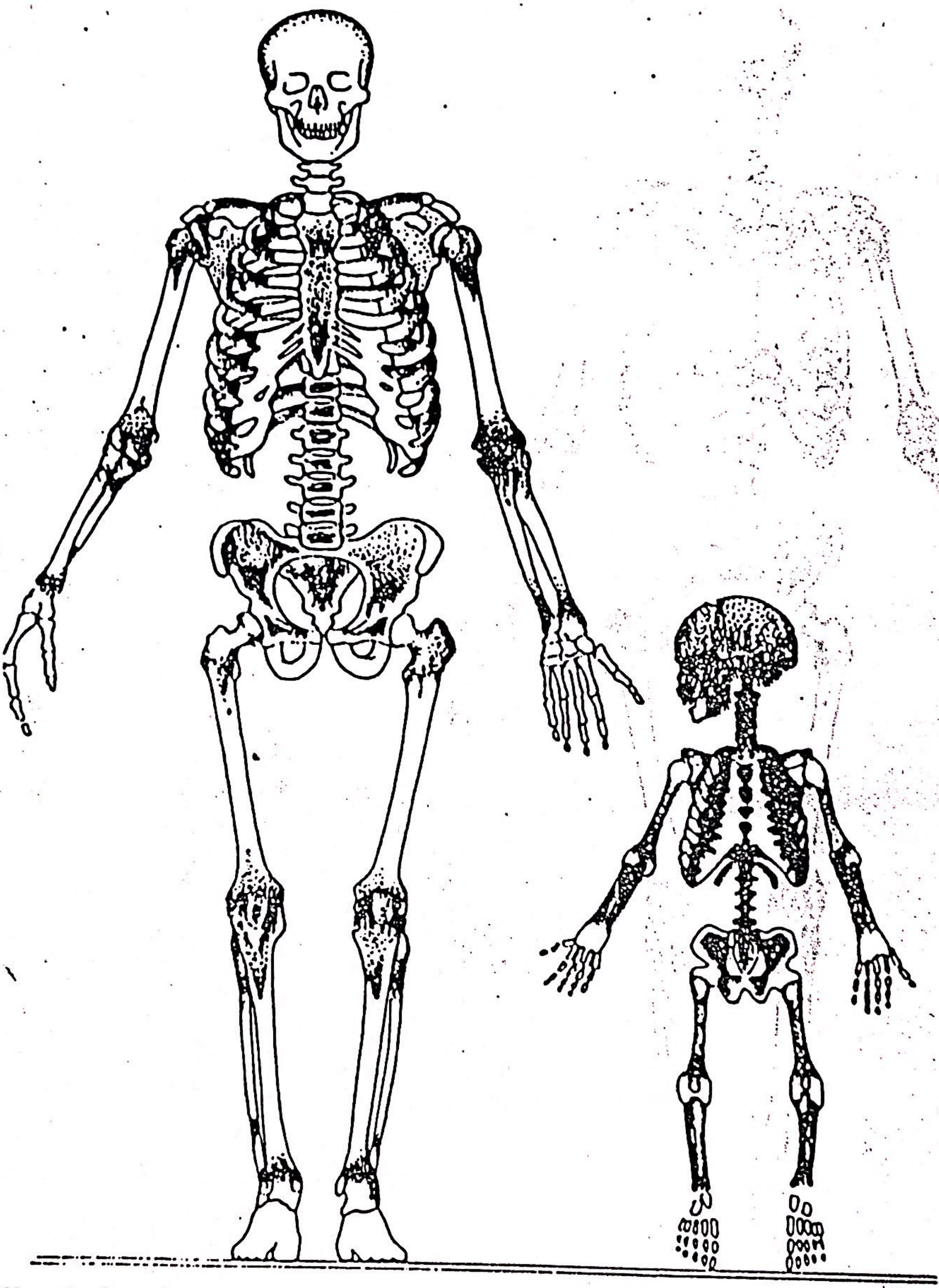

Fig. 8.4 Sites of active haematopoietic marrow (red marrow) in children and adults. There is a similar amount of red marrow (1000 to 1500 g) in each despite the differences in body weight. (*From* Bierman, H. R. (1961) In *Functions of the Blood*, ed. MacFarlane, R. G. & Robb-Smith, A. H. T., p. 357: Oxford: Blackwell.)

Hypoxia	Insufficient O_2 at the cellular level
Anemic hypoxia	Reduced O_2-carrying capacity of the blood
Circulatory hypoxia	Too little oxygenated blood delivered to the tissues; also known as stagnant hypoxia
Histotoxic hypoxia	Cells unable to utilize O_2 available to them
Hypoxic hypoxia	Low arterial blood P_{O_2} accompanied by inadequate hemoglobin saturation

Biogenesis of EP.

I. Kidney

↓ ← Hypoxia

REF (or pro.EP)

↓ ← plasma Globulin

EP

⟷

II. Kidney

↓ Hypoxia

REF (or EP activator)

↓

Pro. EP (or plasma factor) → EP

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1) EP. is glycoprotein → 70% protein, → 30% $C_6H_{12}O_6$ ② M.W. 40,10^3 – 70,10^3
3) Is found in plasma and uline.
4) stimulated by hypoxia and Inhibited by hyperoxia
5) Its half life 5 – 10 hours.
6) 90% of it released by kidneys and 10% from extra-renal sources (e.g. like spleen and liver).

For more obvious typing, see next page.

* Biogenesis of EP. *

I. Kidney → REF (or pro.EP) → EP

↓ Hypoxia ↓ plasma globulin

II. Kidney → REF (or EP. activator) → Pro. EP (or Plasma factor) → EP

↓ Hypoxia

---

① EP is glycoprotein → 70% Protein
→ 30% $C_6H_{12}O_6$

② M.W. $40 \times 10^3 - 70 \times 10^3$

③ Is found in plasma and urine.

④ Stimulated by hypoxia, and inhibited by hypoxia.

⑤ Its half life 5-10 hours.

⑥ 90% of it released by kidneys and 10% from extra renal sources (e.g. like spleen and liver).

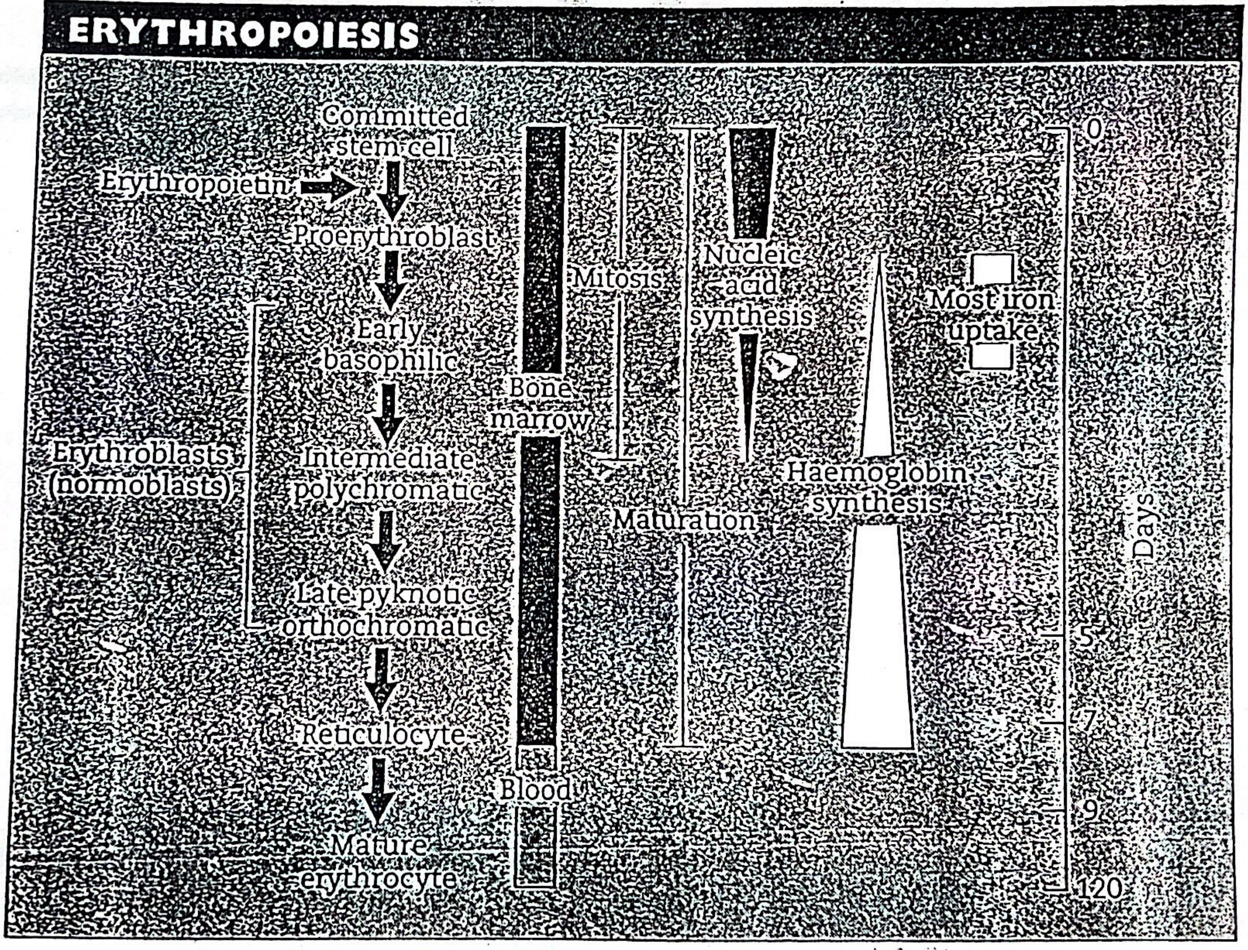

Fig. 12.3 Normal erythropoiesis.

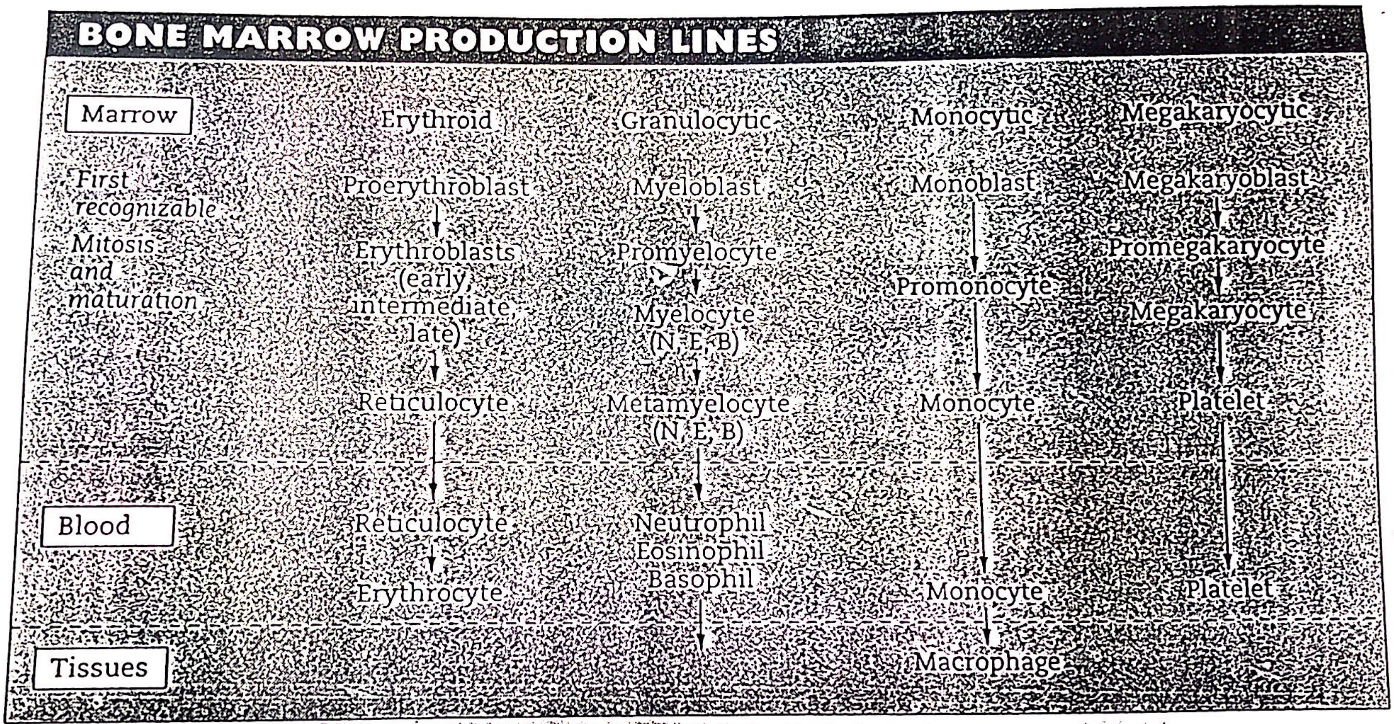

Fig. 12.2 Bone-marrow production lines. B, basophil; E, eosinophil; N, neutrophil.

Table 3.5 Definite effects of vitamin B_{12} or folate deficiency.

1	Megaloblastic anaemia
2	Macrocytosis of epithelial cell surfaces
3	Neuropathy (for vitamin B_{12} only)
4	Sterility
5	Rarely, reversible melanin skin pigmentation