Hématologie Géographique. Écologie Humaine Caractères Héréditaires du Sang. By Jean Bernard and Jacques Ruffié. (Pp. vii + 436; 56 figures + tables. 86 F.) Paris: Masson et Cie. 1966.

Jean Bernard and Jacques Ruffié are well known as haematologists, but in this book they have shown themselves masters of the whole subject of human polymorphism of blood and plasma. They are not only dealing with the blood groups on the surface, but also with the haemoglobin in the interior of the red cells and with numerous plasma proteins, such as haptoglobins, transferrins, and the coagulation factors.

The book begins with a discussion of human ecology and the association of race and biological climate, such as the adaptation of man to the savannah and to tropical forests. There are 15 pages on the ethnic and social aspects of the diversity of man, describing the neolithic revolution of old and the industrial revolution which is recent, and human society in town and country, in advanced and backward societies.

Abnormal haemoglobins, the thalassaemias, and enzyme deficiencies are each dealt with exhaustively, but not too lengthily. The enzyme deficiencies now include those found inside the red cells, such as glucose-6-phosphate dehydrogenase deficiency. Here the polymorphism almost equals that of the abnormal haemoglobins. Other intracellular polymorphisms exist for pyruvate-kinase, diaphorase, and catalase. For plasma, perhaps the most important examples of polymorphism are the pseudocholinesterases and caeruloplasmin.

A large part of the book is given over to the blood groups as a whole, both to their detailed laboratory properties and to their anthropological aspects. The blood groups of platelets and white cells are also included, and so are the serum groups, such as Gm, and even the individual antiglobulins.

It is remarkable that such an all-embracing survey can be so thorough and yet be contained in 436 pages. This book can be thoroughly recommended. The French is not difficult to follow, and most readers in this country will enjoy it. Even so, one wonders whether a translation into English would not be well justified.

HERMANN LEHMANN

Morphogénèse Pathologique. Des Monstrosités aux Malformations. By Bernard Duhamel, with the assistance of Pierre Haegel and Robert Pagès. (Pp. 307; 256 figures + 24 tables. 110 F.) Paris: Masson et Cie. 1966.

France has made many contributions to the science of teratology. Already, in the 16th century, a deep interest in abnormal development and in its causes was manifested by Ambrose Paré, and, in a more popular manner, by Michel de Montaigne. The basic terminology employed in teratology largely stems from the work of the Parisian anatomists Etienne and Isidore Geoffroy de Saint-Hilaire in the early 19th century. Subsequent contributions by Dareste on the artificial production of

monstrosities, of Ancel on chemical teratogenesis, and of Etienne Wolff, have clearly demonstrated a continuation of this interest. Finally, during the last ten years the observations of Turpin and his collaborators have contributed largely to knowledge concerning, and interest in, chromosomal anomalies in relation to abnormal development.

The volume under review is a worthy addition to this tradition; it has as its principal author Dr. Bernard Duhamel, the children's surgeon, who has had the advantage of the collaboration of Drs. P. Haegel and R. Pagès, who are both embryologists.

A distinction is made by the authors between 'monstrosities' and 'malformations'. The former are thought to arise from perturbations in morphogenesis, whereas 'malformations' arise from derangements in organogenesis or histogenesis. The distinction is perhaps not always as easily determined as the authors consider possible, but it is a fact that the earlier the onset of abnormal development, the more widespread is its effect. The abnormalities are considered under several different headings; indeed, it is in the detailed analysis of the regional development perturbations that the greatest interest of this book lies.

The developmental errors are discussed under three principal subgroups. In the first are included the notochordal dysraphias and encephalo-myelo-dysraphias. Secondly, there is the extensive subgroup of perturbations of morphogenesis that result in malformations of the ventral body wall (ectroptychia), the cephalic embryonic pole (ectroprosopia), the caudal embryonic pole, including caudal retrogression (ectrouria), and of the limbs (ectromelia). Detailed accounts are given of the mechanisms involved in the production of monsters in these subgroups. The associated diagrams and schemes submitted in illustration of the possible or probable method of origin and of the result of the morphogenetic fault are often very helpful. Thirdly, the final part of the book is devoted to a fascinating summary of the different types of double monsters. It again contains most useful illustrations.

The bibliography, as with so many French books, lacks titles of papers and contains some errors. The alphabetical index, however, includes a useful teratological lexicon.

In spite of a formalistic approach, this helpfully illustrated volume should prove of interest to anyone concerned with problems of abnormal development. It will, perhaps, be specially useful to those concerned with double monsters and their classification.

J. D. BOYD

Endocrine Genetics. Memoirs of the Society for Endocrinology, No. 15. Edited by S. G. Spickett with the assistance of J. G. M. Shire. (Pp. xv + 325; illustrated. 70s.) London: Cambridge University Press. 1967.

This symposium was conceived, planned, and organized by Dr. S. G. Spickett, who died tragically at the age

of 36 after a long illness—and he was well aware that this book would be one of his memorials.

It is divided into three sections, the first concerned with the level at which hormones act, the second with major gene variations in endocrine systems, and the third with quantitative variations in endocrine structure and function. The emphasis throughout is on basic information, and to understand the book fully it is necessary to have knowledge not only of endocrinology but of the morphology and fine structure of chromosomes and of the work of Jacob and Monod.

Much of section I discusses the evidence that hormones may exert their effect directly on chromosomes. For example, in the midge *Chironomus* there are specialized areas on the giant chromosomes known as puffs which are the visible expression of the active synthesis of RNA. The puffs can be rapidly induced by the injection of the moulting hormone, ecdysone, and though there are some differences of opinion the effect is probably directly on the chromosome (Karlson). The same is probably true of *Rhodnius*, and Wigglesworth describes some of his work on this bug in his summing up of this first part.

In a similar inquiry in man, Diamond, Jacobson, and Sidman report on testosterone-induced DNA synthesis in human bone-marrow. This work is based on the fact that testosterone is used as well as prednisone in the treatment of children with aplastic anaemia (which, in contrast to hypoplastic anaemia, will respond to prednisone alone). Experiments by them and by others led them to suggest that testosterone acts at a level preceding ribosomal function, i.e. at the level of either messenger RNA or of DNA.

In the section on major gene variations, Heller and Spickett discuss the polymorphisms associated with the neurohypophysial hormones, Stanbury deals with iodothyronine synthesis and the so-called 'coupling defect' in familial goitre, and Hamburg and Kessler with thyroid and adrenocortical function in their relation to stress. They point out that recent genetic evidence indicates partial defects in thyroid hormone synthesis to be fairly common, but these may have no effect except under severe prolonged stress and they mention the precipitation of hirsutism in adolescent and adult women by intense, prolonged psychological stress.

The third section, on quantitative variations in endocrine structure and function, begins with a study on

growth and fecundity in mice (Falconer). He finds that genetic differences cause somewhere between one-quarter and one-half of the variation in genetically heterogeneous strains. This, however, as he says, is the end product, but how do the genes influence these processes? Are the genes that control growth, for example, exerting their influence on all the cells of the body, or is their effect exerted only through the activity or amount of endocrine secretions?

Mann throws some light on this. He reports the results of experiments in identical twin bull-calves, one from each pair being kept over periods of several months on a calorie-deficient and one on a normal diet. The effects of underfeeding in the underfed (smaller) twin were assessed by determining quantitatively the onset and development of androgenic function in both twins. In the normally fed twin androgens appeared at 5 months and in the underfed twin 2 or 3 months later, but within each pair of twins there was a remarkable correlation between body weight and onset of androgenic activity, i.e. body growth and androgen secretion probably both depend on the hormonal function of the same organ, namely, the anterior hypophysis which is responsible for the formation and release of both the somatotrophic and gonadotrophic hormones.

It seems that a reduction in the amount of circulating hormone and also a diminished response of the target organs to that hormone both play an important role in the inadequate hormonal status of the poorly growing animal. It was found that the impaired growth of the pubescent male animal resulted both in a delay in the onset of androgenic activity of the gonads, as well as a diminished responsiveness of the target organs (in this case the seminal vesicles) to androgen stimulation.

This is a difficult book for the clinician, and it is to be regretted that problems such as the upset in hormonal balance in carcinoma of the breast have been entirely omitted. Nevertheless it is worth persevering with, for it raises and discusses basic endocrine problems, not the least of which, as Grüneberg mentions, is why in the mouse during development the body makes no attempt to rectify an anomalous situation due to a mutant, though often with a little judicious differential growth here and there, things could be put right again, or at least considerably mitigated.

C. A. CLARKE