of Mary, Queen of Scots, when she held firmly to the belief that she had not authorized her cousin's execution, but had only signed the death-warrant as a precaution in case of Spanish invasion[3].

The medical beliefs about hysteria of later physicians of the past are recounted, including Edward Jorden, Sydenham, Cullen (who returned to the uterine theory), Pinel, Feuchtersleben, Griesingen, R. B. Carter, Jules Fairet, S. Weir Mitchell and Charcot, who studied the malady so brilliantly at the Salpêtrière Hospital in Paris and treated his patients by hypnotism.

Babinski, who was *chef de clinique* to Charcot, was able to show that hysteria was a nosological entity, although certain of its manifestations could be elicited by suggestion and eliminated by persuasion. Walshe[2] refers to this work, and also to the excellent summary of the psychopathology of hysteria by E. Mapother and A. Lewis[4]. The book concludes with an account of the work of Janet and J. Breur. Freud was Breur's pupil and the teaching of his chief led him to the evolution of psychoanalysis and the emergence of psychiatry as a specialized branch of medicine.

"Knowledge grows from more to more", and, as Dr. Veith mentions on p. 164, even Freud stated that the symptoms in some of his patients were not mentally determined or removable by analysis, but must be regarded as direct consequences of disturbed sexual chemical processes[5]. Dr. Veith suggests substitution of the term endocrinological for chemical.

We know to-day that certain manifestations of mental disease, such as general paralysis of the insane, and cerebral syphilis, are due to infection by the *Treponema pallida* and that forms of encephalitis have a virus causation. Again, powerful psychopathic drugs like those of the phenothiazine group produce effects very similar to those seen as sequelae of encephalitis lethargica. Walshe[2] observes that mass hysteria epidemics were attributed to witchcraft or demoniacal possession in past centuries, but "it is likely to-day that we should declare them to be due to some unknown and undiscoverable virus and call the condition encephalitis".

Research workers, including biochemists, may yet discover an organic basis for hysteria. In the meantime, Dr. Veith's admirable study will help reflexion and, possibly, suggest further methods of approach to the problem.

ARTHUR S. MACNALTY


[1] Slater, Eliot, *Brit. Med. J.*, i, 1395 (1965).
[2] Walshe, F., *Brit. Med. J.*, ii, 1451 (1965).
[3] MacNalty, A. S., *Elizabeth Tudor: The Lonely Queen*, 166 (C. Johnson, London, 1954).
[4] Lewis, A., and Mapother, E., in *Price's Textbook of the Practice of Medicine*, 5th ed., 1870 (1937).
[5] Freud, S., *An Autobiographical Study*, trans. by Strachey, J., 46 (Hogarth Press, London, 1946).


# THALASSAEMIA

## The Thalassaemia Syndromes

By D. J. Weatherall. Pp. viii+272. (Oxford: Blackwell Scientific Publications, Ltd., 1965.) 45*s*. net.

HAEMOGLOBINOPATHIES arise basically from an absence of normal adult haemoglobin. One mechanism is the replacement of the structural gene for normal adult haemoglobin (haemoglobin A) by one for that of an abnormal haemoglobin. Notably in the homozygote for the abnormal gene a red cell is produced which is too flat and has a shortened life span. Another type of haemoglobinopathy is called thalassaemia and is a consequence of an under-production of the normal adult haemoglobin, without a replacement by an abnormal variant.

The term thalassaemia is meant to denote an anaemia occurring in the Mediterranean, θαλατα or θαλασσα being the Greek for Mediterranean Sea. The word has come to stay though it is an etymological monstrosity and conveys to a Greek the meaning of 'sea in blood'. Also, while thalassaemia was at first discovered in people of Mediterranean origin, it is now known that this 'Mediterranean' anaemia is widespread and that there are probably more Asiatics affected by this condition than there are Mediterranean people altogether.

The first step in clarifying the diagnosis of thalassaemia was the recognition that this under-production of adult haemoglobin could either be due to a failure in producing the α-chains of haemoglobin A or to one of providing the β-chains. As the α-chains of haemoglobin A ($\alpha_2\beta_2$) are shared with the other physiological haemoglobins F ($\alpha_2\gamma_2$) and $A_2$ ($\alpha_2\delta_2$), a completely different situation arises in α-thalassaemia from that of β-thalassaemia where only the normal adult haemoglobin is affected. There are numerous byways along which the normal haemoglobin A production can be diverted. Some of them have found their biochemical and genetical explanation as, for example, the formation of haemoglobin Lepore which consists of normal α-chains but has as its non-α-chain one which is composed of parts of the δ-chain and of the β-chain. It seems that thalassaemia may eventually be explained as a disturbance at one stage or another along a sequence of steps. This begins with the regulator gene giving permission to the operator gene to switch on the structural gene in the nucleus of the red cell precursor, and it ends with the assembly of amino-acids into polypeptide chains at the ribosome of the protoplasm under the guidance of the messenger RNA. There still remains a bewildering collection of thalassaemia syndromes which have not been tidied up and have not yet been explained on the basis of their genetics and their molecular biology. Nevertheless there is no field in human biology where insight into the synthesis of a macromolecule and its underlying genetical mechanism has been carried so far as in the investigation of the thalassaemias.

In *The Thalassaemia Syndromes* Dr. Weatherall has not made any concessions to simplification but he has succeeded in describing with great clarity the complexity of thalassaemia from every point of view, including those of genetics, clinical disease and therapy. His volume will be a standard work of help to geneticists and biochemists as well as to physicians and pathologists for many years to come.

H. LEHMANN

# MEDICINE AND THE COMPUTER

## Mathematics and Computer Science in Biology and Medicine

(Proceedings of Conference held by Medical Research Council in association with the Health Departments, Oxford, July 1964.) Pp. ix+317+12 plates. (London: H.M.S.O., 1965.) 60*s*. net.

THOSE who attended the Medical Research Council conference in July 1964 seem all to have agreed that it was a remarkable success in respect of the quality of papers presented and the opportunities for exchanges of ideas. Was insistence on publication of the *Proceedings* wise? The topics are not sufficiently closely related to provide a comprehensive summary of the present state of research in a field of science, and many papers are too short to stand alone either as broad reviews or as original contributions. This is not a criticism of the authors, whose papers may have been excellent for conference presentation and discussion, but of the belief that no conference is complete without full publication of proceedings.

The papers may be grouped as concerned with medical records, with classification problems, with epidemiology and therapeutics, and with physiological and cytological studies. Much of the first group consists of plans in outline or preliminary reports on record linkage. The range of ideas may have stimulated valuable discussion; in print