the reader is in a position to pursue further points in which he might be specially interested. This book will appeal to a wide variety of readers and certainly to all those interested in medical genetics.

H. LEHMANN


Formerly mental deficiency practice was a placid backwater of psychiatry. Little was known about the causes of mental defect. The majority of cases were labelled primary amnesia, and a single all-purpose gene determining mental deficiency was invoked as the cause.

A remarkable change in our concept of this subject has occurred in recent years. Many different underlying abnormalities have now been identified as producing the symptom of mental retardation. This has not only altered our attitude to the retarded but brought the subject back into the fields of general medicine, paediatrics, and genetics.

The main advances have been in metabolic and chromosomal studies. These subjects are admirably treated in this book which is the result of collaboration and exchange of ideas between a psychiatrist and a clinical pathologist, both consultants to the Stoke Park Hospital Group.

The chapters deal in turn with many disorders of amino acid, lipid, carbohydrate, endocrine, and connective tissue metabolism known to cause brain damage in utero or during the first two years of life. Each of the abnormalities or syndromes is described under clinical findings, mode of inheritance, laboratory findings, and nature of lesion. The often complicated biochemical changes are explained in clear metabolic diagrams and a very full bibliography follows each chapter.

There is a short chapter on chromosomal anomalies and a large section on the many other abnormalities causing mental retardation. The book concludes with a list of 78 syndromes associated with mental defect but of unknown aetiology. Future observation and careful investigation of these syndromes, many of which are rare, will lead to knowledge of their causation and eventually to their prevention.

The book is clearly and concisely written and has been carefully edited and produced. It is essentially a book of reference, being packed with facts, and will surely be welcomed by all those whose work, whether clinical or pathological, confronts them with the manifold aspects of mental retardation.

L. T. HILLIARD


This book presents 'a unified theory of many physiological and pathological phenomena that, hitherto, have not been clearly connected'. The author links 'central growth control, cellular differentiation, immune mechanisms and some forms of genetic polymorphism to those many disease and ageing conditions that contribute to the ill-health, unhappiness and impoverishment of mankind'.

There seem to be two basic elements in Burch's theory. The first derives from work done by Professor Burwell and himself, and from ideas of Sir Macfarlane Burnet. According to Burwell, the function of the lymphoid system is to stimulate mitosis and to control growth by a positive self-recognition mechanism. This involves a two-way flow between the lymphoid tissue and the tissue it controls. This implies mutual recognition based on identity relations between interacting macromolecules which, the author believes, can be explained by London-van der Waals' forces. This seems surprising in that usually these forces are remarkably non-specific, and are not long range in the biological sense even though they are so called for some physical phenomena. His theory then claims that much disease is caused by a breakdown in this two-way flow which results in auto-aggressive (or 'auto-immune' in more general terminology) conditions, and that these are initiated by a small number of random events, namely a special form of somatic mutation in the genes of the lymphoid (or comparable) cells. Ageing, in the main, consists of a very large number of specific auto-aggressive disorders of this type.

The second element of this theory is derived by analogy with radioactivity. The decay of radioactivity in any given mass of radium depends on completely random, disintegrating events in the mass of atoms. The rate of disintegration (or the intensity of the radioactivity) decreases with time according to a particular negative exponential law. He finds a similar relation when he plots the relative age-specific initiation rate of certain diseases, on a logarithmic scale, against the estimated mean age at the initiation of the disease. From this he deduces that the initiation of the disease is caused by random events (in cell nuclei), very much as radioactivity is caused by random disintegrations of atomic nuclei.

The theory is developed carefully and honestly. For example, for this relation it is necessary to determine the age at which the disease was initiated; in fact the available statistics show only the age at which it was diagnosed. Guess-work (or 'trial-and-error procedures') plays no small part in estimating the age at which the disease began, but Dr. Burch makes this clear. And to get all his selected conditions to fit his theory he has to postulate as many as 18 random initiating events for one condition. In his eagerness to generalize his theory he even claims that the first fractures of the forearm are due to somatic mutations: 'Although trauma may often precipitate this type of fracture . . . the underlying pathogenesis of the condition is generally auto-aggressive.'

The theory is closely argued, and a considerable weight of evidence is offered in its support, though Dr. Burch admits that, 'unfortunately, the would-be synthesiser is obliged to survey fields in which he has no specialist training, and he cannot always distinguish,
even with the help of specialists, that which is scientif-
ically established from that which is mythology and
dogma'. It is likely that this book will delight those
who like broad generalizations, preferably based on
mathematics, but it will be less than convincing to those
who like precise experimentally provable checks at each
stage of a theory.

Joseph Chayen

Surveys, Symposia, and Transactions

Biomedical Challenges Presented by the American
Indian. Proceedings of the special session held dur-
ing the Seventh Meeting of the Pan American Health
Organisation Advisory Committee on Medical Re-
search (1968), World Health Organisation, Washington
D.C. Scientific Publication No. 165. (Pp. vi + 185; illustrated + tables. $2.50.)

This was an important conference since it brought
together a large number of scientists who have contrib-
uted—piecemeal as yet—to the knowledge of the Ameri-
can Indian, with studies in anthropology, genetics,
nutrition, and medical problems such as gall-bladder
disease, hyperglycaemia, malaria, tuberculosis, and
iodine deficiency. It is hoped that this meeting will set
the style to catalyse a truly interdisciplinary approach,
and in this way achieve an understanding of the human
biology of the Indian.

The first human occupants of North America came
from N.E. Asia; this migration has been dated variously
from 12,000 to 40,000 years ago. It might be appro-
priate now to consider all the aboriginals of the World as the
'American Geographical Race'. Within this classi-
fication the Eskimos are genetically different from the
other North American Indians. The latter have
enormous variability on the basis of morphological
characters and genetics, even within the undisturbed
tribe, and from one part to the next.

The pattern of disease is also variable; in some situa-
tions, geography alone determines prevalence. For ex-
ample, endemic goitre has been found practically where-
ever it has been looked for. This is because iodine is not
abundant in America, except for the nitrate deposits in
Northern Chile. It was suggested that these circum-
stances gave an excellent opportunity to study the com-
parative pathogenesis of endemic goitre, with the
interplay of genetic endowment and different environ-
ment. Such knowledge would help rational prophylaxis
programmes.

Malaria prevails over large areas of the western hemi-
sphere between latitudes 50° N and 40° S. There are 13
species of American anopheline mosquito, 7 being vectors
of major public health importance. After World War II
there was vigorous antimalarial activity, using vector
destruction and chemotherapy; but there was little or no
attempt to establish baseline data on the local epidemi-
ology of the disease. There is even less knowledge about
racial differences in susceptibility, since a prerequisite is
controlled information about environment and exposure.

Studies have been understandably rare, and conclusions
tentative. There is, however, one community, the Bush
negroes of Surinam, who have a high tolerance to malaria
infection, in contrast to their neighbours. The Bush
negroes are descendants of African slaves, and in com-
mon with North American Negroes still enjoy an im-
munity built up by their ancestors. This is a remarkable
cue for intensive research. The problem of eradication
of malaria in the susceptible Amerindians is difficult
logically for those who are isolated and inaccessible.
The disease is frequently broadcast with nomadism or
migration. A good example was given of the value of
sociological background knowledge. One of the success-
ful ways to help these people is by using salt medicated
with chloroquine, and therapy has been introduced via
the normal intertribal barter trade in a bag of salt rather
than the spray-gun or bottles of tablets.

A report on the Pima Indians of Arizona showed that
they had an unusually high prevalence of gall-
bladder disease (37% males, 68% females). Diabetes
was also prevalent—15 times the rate in the U.S.A.
generally, and certainly higher than in that Indian
tribe, the Cherokees of North Carolina. Hypergly-
caemia, which was found in substantial numbers of
young people, will become symptomatic as retinopathy
and nephropathy in the future. It was suggested that
this early warning should stimulate parallel studies of
groups of the same race in Central and South America,
for, as life expectancy is increased, diabetes mellitus
might emerge as a major chronic disease, as it is among
the Pima Indians.

One of the most important bases of the environment is
nutrition. There was an account of the diet of the
Mayan Indians in Guatemala. In pre-Columbian days,
the Mayas were better off than at present because they
had access to game, more land for cultivation, absence
of competitive cash markets, and their infants were
protected by prolonged lactation. Modern socio-cultural
and economic changes have worsened their diet, with the
result that protein deficiency in small children is
most serious. This case study is a warning to other
American Indian groups living with populations of
Western culture or being incorporated into modern
Latin-American culture.

The moderator, Dr. James V. Neel, explained the
relevance of the International Biological Programme to
these studies of the American Indian. The classical
foundations of public health practice can be made more
secure with knowledge from population genetics and
environmental physiology. Surviving primitive popula-
tions afford an opportunity to study physiological and
genetic adaptations potentially quite different from those
of highly civilized groups. Ironically, it is they who
have lived under their conditions far longer than we
have, and many of their adaptations have been complex
and ingenious. In fact the term 'primitive' is a misno-
er—better 'preliterate with relatively simple tech-
nology'. The effort to comprehend man's interaction
with his environment carries far beyond the identifica-
tion of his genetic traits—valuable as these new bio-
chemical markers are.